



# **ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

**FOR THE PROPOSED MINING ACTIVITIES ON MINING CLAIM 70262 SITUATED IN THE  
KARIBIB AREA – FARM NO. 46 OKAWAYO  
ERONGO REGION**

**CLIENT:**

Mr. Sydney Hubert Lesley Goagoseb  
and  
Adaptabiz Investments CC

**FEBRUARY 2018**

**PREPARED BY:**

Company: EnvironClim Consulting Services cc  
Consultant: Mr. Gideon Kalumbu

## PROJECT INFORMATION

<b>PROPONENT:</b>	Mr. Sydney Hubert Lesley Goagoseb and Adaptabiz Investments CCs Windhoek NAMIBIA
<b>PROJECT TITLE:</b>	Proposed mining activities on Mining Claim No.70262 situated in the Karibib, Erongo Region.
<b>PROJECT TYPE:</b>	Environmental Impact Assessment Study
<b>PROJECT LOCATION:</b>	Karibib, Farm no. 46 Okawayo, Erongo Region, Namibia
<b>COMPETENT AUTHORITY:</b>	Environmental Commissioner (Ministry of Environment and Tourism)
<b>ENVIRONMENTAL ASSESSMENT PRACTITIONER</b>	Environclim Consulting Services cc Contact person: Mr. Gideon Kalumbu P.O Box 6917, Windhoek, Namibia E-mail: <a href="mailto:msilk@gmail.com">msilk@gmail.com</a>
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## **EXECUTIVE SUMMARY**

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Mr. Sydney Hubert Lesley Goagoseb herein intends to undertake mining activities by setting up a mining plant for dimension stones at Mining Claim (MC) No. 70262 (*16.0246 Ha in size*) at farm Okawayo No. 46 in Karibib area. This Environmental Management Plan (EMP) serves as a risk strategy that contains logical framework, monitoring programs, mitigation measures, and management control strategies to minimize potential environmental impacts to insignificant level. It further stipulates the roles and responsibility of persons involved in the project.

In a bid to conduct the mining activities in an economically sound manner, Mr. Sydney Hubert Lesley Goagoseb and Adaptabiz Investments cc, a 100% Namibian owned company, formed a joint venture at technical cooperation level. The joint venture intentions are to use the procedural and professional capacity of Adaptabiz Investment cc to guide the mining activities for dimension stone, *i.e.* marble. Hence, Adaptabiz Investment cc is hereinafter referred to as the proponent. Subsequently, this led to the appointment of EnvironClim Consulting Services cc to commission an Environmental Impact Assessment (EIA) and develop this Environmental Management Plan (EMP) for the envisioned operations, to apply for an Environmental Clearance Certificate (ECC) with the Environmental Commissioner's Office.

It is worth noting that, the sites of the proposed mining activities already border other authorized mining activities for the same commodities (*i.e. marble rocks*). Thus, the natural setting of the area is accustomed to similar operations. Moreover, the study clinched that the potential impact of the proposed development (*mining operation*) on the natural environment of the surrounding area will be insignificant. The only impact which can potentially cause detrimental impact on the environment in the long term is the potential introduction of pollutants in the environment. This can be addressed by strictly adhering to the mitigation measures recommended in the Environmental Management Plan. Other minor areas of concern such as noise and occupational health issues can be addressed through internal policies and proper housekeeping.

It is therefore recommended that this project be issued with an Environmental Clearance Certificate (ECC) on condition that the provisions of this Environmental Management Plan (EMP) are fully implemented.

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**MINING CLAIM 70262 EMP**

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## ABBREVIATIONS

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<b>DEA</b>	Department of Environmental Affairs
<b>EA</b>	Environmental Assessment
<b>EAP</b>	Environmental Assessment Practitioner
<b>ECC</b>	Environmental Clearance Certificate
<b>ECO</b>	Environmental Compliance Officer
<b>EIA</b>	Environmental Impact Assessment
<b>EMA</b>	Environmental Management Act (No. 7 of 2007)
<b>EMP</b>	Environmental Management Plan
<b>MET</b>	Ministry of Environment and Tourism
<b>SM</b>	Site Manager

# 1. INTRODUCTION

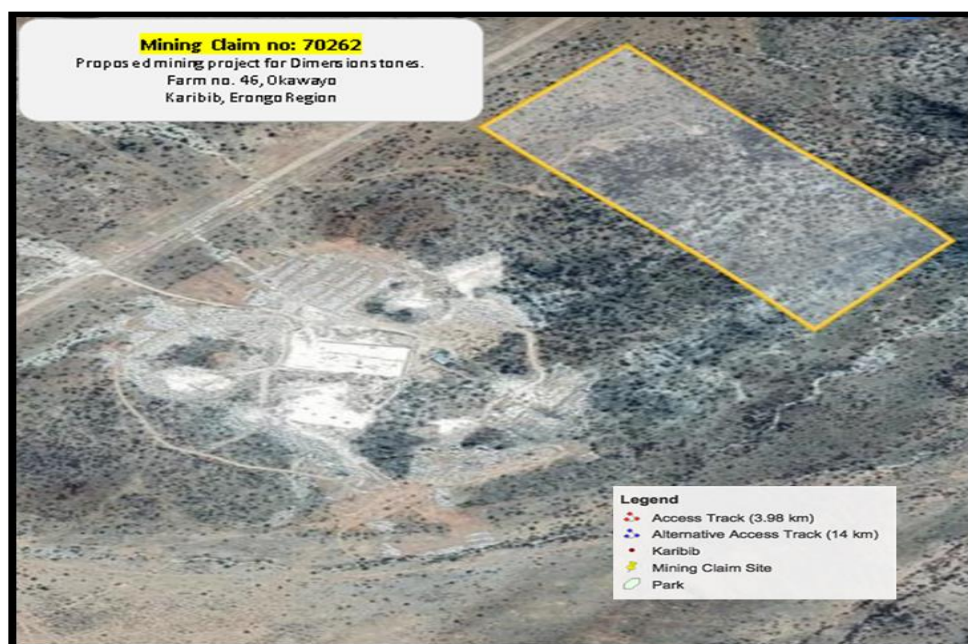
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## 1.1 BACKGROUND

Mr. Sydney Hubert Lesley Goagoseb is a Namibian citizen who rightfully obtained a Non-Exclusive Prospecting License (NEPL) and Mining Claim (MC) 70262 at farm Okawayo No. 46 in Karibib area measuring 16.0246 Ha in size (Appendix 1).

In a bid to conduct the mining activities in an environmentally sound manner and sustainably, Mr. Sydney Hubert Lesley Goagoseb and Adaptabiz Investments cc, a 100% Namibian owned company, formed a joint venture at technical cooperation level. The joint venture intentions are to use the procedural and professional capacity of Adaptabiz Investment cc to carry out mining activities for dimension stone, marble for MC 70262. Hence Adaptabiz Investment cc would be hereinafter referred to as the proponent.

In line with the above, and in a bid to comply with Environmental Management Act of 2007 (EMA), EnvironClim Consulting Services cc was appointed to develop this Environmental Management Plan (EMP) for this operation and apply for an Environmental Clearance with the Environmental Commissioner's Office.



**Figure 1:** Project Site - Google Earth imagery with a rough sketch (not to scale) of the location of the Mining Claims in yellow.

## **1.2 PURPOSE OF THE EMP**

This Environmental Management Plan (EMP) is a risk strategy that contains logical framework, monitoring programs, mitigation measures, and management control strategies to minimize potential environmental impacts to insignificant level. It further stipulates the roles and responsibility of persons involved in the project.

The development of an EMP is a requirement for any EIA project as per Namibia's Environmental Management Act No.7 of 2007. Therefore, this EMP is a legal document that must be complied with.

### **1.2.1 TRAINING**

All key role players such as the workers on site must be informed about the contents of this EMP through structured training programs. This can form part of the regular site meetings.

## **1.3 TERMS OF REFERENCE**

The proponent required the consultant to carry out this study as per the requirements of the *Environmental Management Act No.7 of 2007* and the *Environmental Assessment Regulations* (February 2012). As such, the Terms of Reference for this study are as follow:

- Provide a detailed description of the proposed project;
- Identify all legislations that are relevant to the proposed project;
- Describe the receiving environment (both bio-physical and socio-economic) to determine environmental sensitivities;
- Conduct the public participation process by informing all Interested and Affected Parties about the proposed project and provide them with an opportunity to participate during the EIA process;
- Identify the potential environmental impacts (both bio-physical and socio-economic) of the proposed project and assess their significance; and
- Develop an Environmental Management Plan (EMP) where management and mitigation measures are outlined to minimize and/or mitigate potential negative impacts.



#### **1.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)**

EnvironClim Consulting Services cc is a wholly Namibian owned company, established to provide consulting services to various public and private sectors in areas such as Strategic Environmental Assessments (SEA) & Environmental Impact Assessments (EIA), development of Environmental Management Systems, Environmental Auditing, Monitoring and Evaluation, Water Management, Solid Waste Management and Project Management.

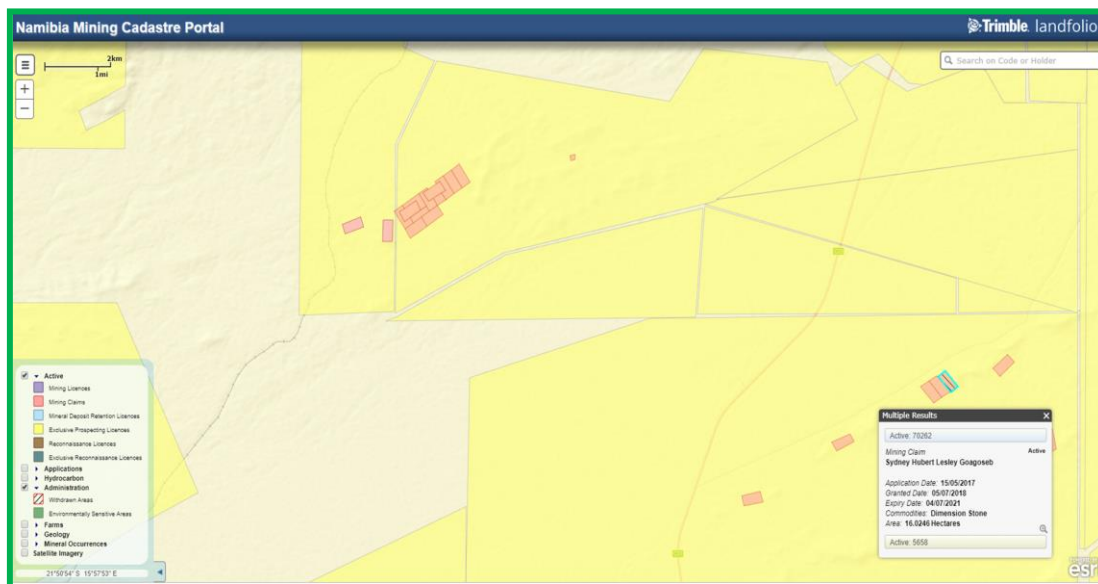
The project will be managed by Mr. Gideon Kalumbu who hold a Bachelor of Science Degree in Natural Resource, Bachelor of Science Honors Degree in Water Utilization from the University of Pretoria, South Africa, master's degree in integrated water resources management, University of Science and Technology and currently registered as a PhD candidate for Environmental Management at the University of Free State, South Africa.

## 2. DESCRIPTION OF THE PROPOSED PROJECT

### 2.1 SITE LOCATION AND SURROUNDING LAND USE

#### ▪ Location

The proponent intends to carry out mining activities at the and Mining Claim (MC) 70262 at farm Okawayo No. 46 in Karibib area measuring 16.0246 Ha in size. The sketch and details obtained from <http://portals.flexicadastre.com/Namibia/> are below (in figure 1).



**Figure 2:** Show the comprehensive details of the Mining Claim 70262. Google Earth imagery with a rough sketch (not to scale) of the location of the Mining Claim.

#### ▪ Surrounding land use

The site in the Karibib area is surrounded by small scale mining activities, and majority are in the semi-precious stones and dimension stones mining. The proposed mining plant will be developed in an area that is already disturbed by ongoing mining activities by the adjacent mining claims as shown on the pictures below.



**Picture 3:** Snippets of current mining activity disturbances near the site at the MC 70262.

## **2.2 PROPOSED PROJECT ACTIVITIES**

The mining operations will be undertaken at MC 70262 in the Karibib area. The proponent intends to mine for Dimension stones, i.e. marble.

### **Project phases**

The project development would be conducted into four (4) key phases as per the project business case/concept note;

#### **1. Pre-Construction Phase**

This shall encompass initial preparatory steps of the mining project, and hence begin with the establishment of access roads. This project however, borders an existing active quarry with similar operations (*dimension stones mining*). Therefore, the requirement by this project would be to ensure that existing access road maintenance and basic infrastructural considerations i.e. for the D 1941 road which is accessed via C33.

A small administration building, storage and workshops would be erected using pre-fabricated materials in line with best practices regarding health and safety. A containerized electric generator would be installed for electricity generation. A borehole would be drilled on site to supply water for mining operation, mainly for dust suppression of which 100% of the water used would be recycled. Workers will be accommodated at Karibib where all amenities shall be supplied and connected to municipal services.

#### **2. Construction Phase**

A stock yard and waste rock dump would be constructed during the establishment of the quarry site. Waste rocks would be stored near the quarry, which would be later be dumped into the quarry pit after the depletion of the marble ore. In a bid to boost local trade, some of the waste rocks would be sold to small miners for further processing into finished products such as tiles, while cracked and good quality rocks would be crushed into rock powder and sold to other industries such as paint and wall fillers industries. Henceforth there would be no excessive waste generation. A stock yard would only require vegetation clearing, and levelling. During this phase there would be no excavation for its construction.

### **3. Operational Phase**

#### *Removal of overburden*

The overburden on top of the ore would be done by scrapping and excavating prior to the commencement of mining activities on the claim. Furthermore, the overburden would mainly consist of top rocks that are damaged by radiation exposure. These materials would be dumped at the approved and designated waste rock dump.

#### *Marble Extraction*

This phase will happen after exposing the ore. The marble would be extracted using non-explosive cutting technologies. This would be achieved by drilling a series of overlapping holes using a drill that is mounted on a quarry bar or frame that aligns the holes and holds the drill in position. An expansion material would be filled into the hole to enable cracking. Sawing would be done using cutting disk and diamond wire. The large volumes of rocks would be cut using a diamond wire, and then separated into smaller pieces that are suitable for transportation. In some instances, commercial blocks would be cut directly from the rock body.

### **4. Decommissioning phase**

It is envisioned that, after the depletion of resource from the pit, mining operation would gradually cease, and a mine closure and rehabilitation plan operationalized. To ensure environment management and human safety, the following aspects shall be undertaken at the end of the project series

1. *The mine must not be abandoned*
2. *Employees, relevant authorities and public must be notified about the mine closure before time*
3. *Establish a mine closure plan for rehabilitation*
4. *Establish employees benefits after closure*
5. *Ensure that all contaminated materials must be properly cleaned before they disposed to approved sites. No burying of waste is permitted.*
6. *All building and installations must be demolished and used to fill up the quarry.*
7. *The quarry must be filled to 30m from the surface to enable a health water harvesting body.*
8. *These works must be supervised by qualified and competed persons.*
9. *Further, it is recommended that an environmental specialist be hired to monitor environmental concerns during the decommissioning phase*
10. *Workers must be provided with all necessary PPE during demolition*
11. *Blasting would not be allowed during decommissioning.*

## 2.3 INFRASTRUCTURE AND SERVICES

### Access road

The project site will be accessed by the two-track existing road as shown on the pictures below figure 4.



**Figure 4:** Shows the access road from the main road, and the outlet that branches off leading to the site.

### Electricity supply

Power for the proposed mining activities will be supplied using generators.

### Water supply

Water will be supplied from boreholes within the area.

### Sewage management

Toilet facilities will be provided on the sites for the use of the workers. Septic tanks will be provided and emptied as need be.

### Waste management

All waste generated at the sites will be stored in appropriate containers and transported to the nearest waste disposal sites (*subject to Karibib Municipality guidance*). Hazardous waste such as hydrocarbons and other chemical waste used in the operations will be especially stored in designated containers and disposed of accordingly.

### 3. LEGAL REQUIREMENTS

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This section provides an analysis of the policies and legislations that are relevant to the proposed development of mining activities at MC 70262.. The table below starts off with the Constitution as the overarching legal statute and subsequently lists the various environmental and developmental policies and legislations that have relevance to the proposed project. The relevant clauses and provisions of these policies/legislations are also highlighted. A generic comment on what the developer needs to note is also included in the table.

**Table 2: Legal Framework of the proposed project**

LEGISLATION	PROVISION	REGULATORY AUTHORITY	APPLICATION TO THE PROJECT
The Constitution of the Republic of Namibia	Article 91 (c) and 95 (i) which commit the state to actively promote and maintain environmental welfare of all Namibians by promoting sustainable development	Government of the Republic of Namibia	The project should not pose a threat to the natural and human environment.

Legislation	Summary	Applicability to Assessment
<b>Environmental Management Act No. 7 of 2007</b>	This act aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters	The Act provides a list of activities that may not be undertake without an environmental clearance certificate to prevent environmental damages. The project area harbors a variety of both flora and fauna including protected and endemic species.
<b>Mineral Resource Act, Act 1992.</b>	Reconnaissance, prospecting, and Mining of Mineral in Namibia and Issuance of all permits.	Issuance of Mining permits

Legislation	Summary	Applicability to Assessment
<b>Draft Pollution Control and Waste Management Bill</b>	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management	To protect the Environment from possible hydrocarbons and oil leaks from the machinery, trucks and vehicles. Eliminate or minimize ground water contamination.
<b>Environmental Policy framework (1995)</b>	This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment.	Consideration of all possible impacts and incorporate them in the development stages

Legislation	Summary	Applicability to Assessment
The Occupational Safety and Health Act No. 11 of 2007	Promotes the Safety and Health of employees at the work place	Employees subjected to noise and dust
Public Health Act No. 36 of 1919	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.	Application of proper mitigation measure to noise and dust and safety risk
Labour Act No. 11 of 2007	This Act outlines the labour laws which encompass protection and safety of employees at work.	This project will require labour during its operational stage and decommissioning stage.



Legislation	Summary	Applicability to Assessment
<b>Water Act No, 54 of 1956</b>	<p>All water resources belong to the State. It prevents pollution and promotes the sustainable utilization of the resource</p> <p>All applicable permits must be obtained under the provisions of Sections 21(1) such as;</p> <ul style="list-style-type: none"> <li>▪ water abstraction permits;</li> <li>▪ domestic effluent discharge permits (site offices, construction camp); industrial</li> <li>▪ effluent discharge permits;</li> <li>▪ water use for dust suppression; and</li> <li>▪ water reticulation permits (pipelines).</li> </ul>	<p>Prevention of discharging contaminated water at unauthorized places particularly areas with shallow water table.</p> <p>Sustainable use of water resource</p>
<b>Soil Conservation Act No. 76 of 1969</b>	<p>To promotes the conservation and compacting of soil erosion</p>	<p>Uncontrolled movement of heavy vehicles and truck at areas surrounding the site may cause land degradation</p>
<b>Water Resource Management Act No.11 of 2011</b>	<p>The Act stipulates the prevention of both Surface and Ground water sources.</p>	<p>Oil spillage coming from mining equipment and transporting vehicles need to be minimised to avoid groundwater contamination.</p>

Legislation	Summary	Applicability to Assessment
<b>Public Health Act no. 36 of 1919</b>	The Act gives provision for the protection for the health of all people.	The noise and dust level emanating from the project could affect the surrounding community and vegetation in the vicinity.
<b>National Heritage Act No.27 of 2004</b>	The Act gives provision of the protection and conservation of places and objects with heritage significance.	The chance of finding Human Remains due to colonial history or crime, Artefacts, and or heritage materials at and around the mine site is probable
<b>Local Authority Act No. 23 of 1992</b>	This Act underlines the duties and functions of the Local Authority is be aware of activities such as mining within or adjacent to the boundary of the town.	All stakeholders affected by the operations of the project have been informed of the developments including that of undertaking the EIA.
<b>Minerals (Prospecting and Mining) Act No 33 of 1992</b>	Section 50 (i) requires “an environmental impact assessment indicating the extent of any pollution of the environment before any prospecting operations or mining operations are being carried out and an estimate of any pollution, if any, likely to be caused by such prospecting operations or mining operations”	The proposed activity is prospecting for minerals, hence it requires an EIA to be carried out and adhere to the act’s provisions.
<b>Climate Change</b>	Namibia is a signatory to United Nations Framework Convention on Climate Change (UNFCCC) (1994), the convention sets framework for intergovernmental Efforts to address challenge posed by climate change, such as carbon dioxide emission.	Use of heavy machinery that consumes hydrocarbons  Burning of fuel for electricity generation

## **4. ROLES AND RESPONSIBILITIES**

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### **4.1 Environmental Compliance Officer (ECO)**

This is an individual that represent the governing authority (MET). Depending on his/her work schedule, the ECO shall visit the site at any time for environmental inspection and monitoring.

### **4.2 The Proponent**

The management hereinafter referred to as Adaptabiz Investment, shall assume overall responsibility to ensure full implementation of the EMP. Further the proponent must ensure to;

- *Appoint a site Manager*
- *Ensuring that all workers are inducted on safety measures*
- *Safer working environment*
- *Provide workers with Personal Protective Clothing*
- *Monitor the employees works about safety*
- *Ensure employees understand the guidelines of the Environmental Management Plan (EMP)*
- *Ensure the environment is protected and*
- *Maintain healthy relationship with the neighbours*

### **4.3 Site Manager (SM)**

The Site Manager will be responsible for the monitoring of daily operations and ensure adequate adherence to the EMP. The Site Manager should ensure that a copy of the EMP is always available at all project premises. Further, an induction should be conducted with all employees and be made understand the provision of this EMP.

### **4.4 Employees**

- *Adhere to the EMP*
- *Ensure to wear personal protective clothing at all time when working*
- *Report worn out PPE and request for replacement*
- *Adhere to the Company rules and policies*

### **4.5 DISCIPLINARY ACTION**

The EMP is a legally binding document. Non-compliance to the EMP must result in punitive Legal action measure to be taken against the Proponent such as; Suspension of work, Financial penalties. The disciplinary action shall be determined according to the nature and extend of the non-compliance, and exact penalties are to be weighed against the severity of the incident.

## 5. THE ENVIRONMENTAL MANAGEMENT PLAN

The scope of this EMP is with reference to the EIA for the Pre-Construction, Construction, Operational and Decommissioning phase of the proposed project. This EMP is structured by considering Social, Environment and Safety and Occupational Health aspects associated with this project as summarised in table 5.1.

**Table 5.1 Environmental Social Management Plan (ESMP)**

Activity	Objectives
A – Staff Induction	Induction
	Communication
B – Health and Safety	General safety at work place
	Road Safety
	Ablution facilities
	Dust and Noise Exposure
C – Pollution and Waste Management	Material waste, domestic waste, vehicle Parts etc.
	Vehicle emissions, Dust and Noise
	Hydrocarbon, Oil and Lubricant leakages
D – Environment	Water
	Ecology
	Rehabilitation
E – Cultural Heritage	Archaeology or Heritage
F – Socio- Economic	Employment
	Alcohol and Drug Abuse
	Working hours
	Capacity building
	HIV / AIDS

## SECTION A: STAFF INDUCTION

**Table 5.2 : Staff Induction Mitigation Measures**

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
Staff Induction	To ensure that all staff and employees are familiar with the requirements of the EMP	<ol style="list-style-type: none"> <li>1. All employees must attend a thorough and comprehensive induction course on all the provisions of the EMP.</li> <li>2. Staff operating specialised equipment and heavy vehicle must be properly trained and informed of the potential risks associated with their tasks</li> <li>3. There must be an annual induction course for all the workers.</li> <li>4. New employees must not start</li> </ol>	<p>Induction Minutes and Attendance Register Signed by each staff member</p> <p>Induction Report</p>	Management or Site Manager

		work without taken through the induction course.		
	Disciplinary	<p>1. Company must adopt a disciplinary system to discipline staff for non-compliance, such as not using ablution facilities and disposing off waste uncontrollably etc.</p> <p>2. Strict measure must be put in place, any employee found contravening provisions of the EMP, must be granted a warning letter.</p>	<p>Disciplinary meetings and actions</p> <p>Disciplinary letters / Warnings</p>	Management or Site Manager
	Availability of the EMP on site for ease of reference	1. Ensure that a copy of the EMP is kept on site and accessible	Physical view of the EMP	Management or Site Manager

<p><b>Communication</b></p>	<p>To ensure effective communication</p>	<ol style="list-style-type: none"> <li>1. Develop a communication strategy</li> <li>2. Correspondences must be in writing</li> <li>3. The contact numbers for the Site Manager and Team Leaders must be available displayed onsite in case of emergencies.</li> <li>4. There must be an alarm bell for emergency communication</li> </ol>	<p>Communication Strategy</p> <p>Letters, e-mail, Notices, Minutes</p>	<p>Management or Site Manager</p>
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## SECTION B: HEALTH AND SAFETY

**Table 5.1: Health and Safety Measures to be implemented**

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
Safety at Work Place	Ensure safety of employees  Adhere to the Health and Safety Regulations, Government Notice 156/1997 (GG 1617)	<ol style="list-style-type: none"> <li>1. Develop a Health and safety Plan</li> <li>2. Occupational health and safety measures must be implemented in accordance to the Labour Act of 2007 and other relevant laws and legislation</li> <li>3. A compulsory safety induction course must be given to all employees.</li> <li>4. Adequate safety signs must be put at designated places</li> </ol>	<p>Health and Safety included and reflected in the Induction Minutes</p> <p>Thorough inspection of the workers</p> <p>Record and Minutes of Induction Course</p>	Management or Site Manager



Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<p>around the mining site.</p> <p>5. Each employee must be provided with personal protective equipment (PPE) and must be worn all the time during working and when on site.</p> <p>6. Employees must be properly trained in using machines to avoid fatalities.</p> <p>7. Supervisors must undergo an occupational health and first aid course.</p> <p>8. Waste rock dump and Stock yard must be stable to</p>	<p>Adequate protective gear for all staff</p> <p>Availability of the first aid kit onsite</p>	

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<p>avoid rolling of rocks</p> <p>9. There must be clear health and safety signs at designated sites such as, NO SMOKING “DANGER”, “ENTRANCE PROHIBITED” etc.</p> <p>10. No unauthorised fires shall be permitted on or off site;</p> <p>11. Smoking is only permitted at designated sites with low risk to fire;</p> <p>12. There must be adequate and suitable fire-fighting equipment which must be</p>	<p>Availability fire extinguishers and evidence training (e.g. minutes, training pictures etc.).</p>	

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<p>well inspected at all time;</p> <p>13. There must be clear signs of high risk fire areas</p> <p>14. NO firearms or weapons of any sort must be allowed on the work premises</p>		
<b>Sanitation diseases hazard</b>	Reduce health risks and environmental pollution	<p>1. Provide adequate and clean ablution facilities for all staff at a ratio of one toilet to 15, and 30 for female and males respectively</p> <p>2. No faecal waste should be discharged on the open environment;</p> <p>3. Acts of secretion and</p>	<p>Number of ablution facilities on site</p> <p>Reports of faecal secretion on site</p> <p>Visual inspection of ablution facilities</p>	Management and Site Manager

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
Employee Hearing loss and Wildlife		<p>urination, other than at the toilet facility provided, must be strictly prohibited.</p> <p>4. Appoint a cleaner or rotate cleaning responsibilities among workers to ensure clean ablution facilities</p> <p>5. Separate Male and female toilets</p> <p>6. Inspect ablution facilities regularly</p> <p>7. Supply safe drinking water</p> <p>8. No employees must be exposed to noise levels above the 85dB (A) limit</p>	Visual inspections	

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
Disturbances		<p>over a period of 8 hours.</p> <p>Should the noise level be higher than 85dB (A), the employer must implement a hearing conservation program such as noise monitoring.</p> <p>9. Vehicles and machinery must be switched off when not in use</p> <p>10. Where possible, install silencer on vehicle and machinery exhaust to reduce noise levels</p> <p>11. Purchase equipment with</p>		

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<p>low noise emission;</p> <p>12. Power generators must be containerized to suppress noise emission.</p>		
Air pollution	To reduce dust emission	<p>1. Adhere to the Labour Act No. 11 of 2007.</p> <p>2. Non-toxic human dust exposure levels may not exceed 5mg/m<sup>3</sup> for respiratory dust and 15mg/m<sup>3</sup> for total dust.</p> <p>3. Apply dust suppression method such as water spraying during cutting of marble blocks from the ore</p>	Number of poor health complains	

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<p>body</p> <p>4. Avoid working during windy times.</p> <p>5. Provide protective eye glasses, dust masks and ear muffs to all employees operating in a dusty or noisy environment</p> <p>6. Workers must do an annual health check up on the cost of the proponent</p> <p>7. Wet drilling is recommended</p>		
<b>Road Accidents</b>	To avoid road accidents during marble and	1. Adhere to the Road Authority Act regarding the transportation of goods on	Road accident report  Damage to roads	Project Management and Site Managers

Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
	<p>machinery transportation</p>	<p>public roads.</p> <p>2. Movement of heavy and slow vehicles on C33 road must not take place during peak traffic hours to avoid traffic congestion.</p> <p>3. Inform the Traffic Department at Karibib when transporting /operating abnormal machinery.</p> <p>4. Road maintenance by continuous recycled water spraying and grading or scrapping.</p> <p>5. Do not operate heavy</p>		



Environmental / Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		vehicles on wet roads  6. Waste rocks must be dumped on a stable waste rock dump to avoid rolling of rocks		

## SECTION C: POLLUTION CONTROL AND WASTE MANAGEMENT

**Table 5.4: Waste Management Mitigation Measures**

Environmental / Social Aspect	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
<b>Vehicle Emissions</b>	Reduce greenhouse gas (GHG) emissions from vehicles / machinery	<ol style="list-style-type: none"> <li>All vehicles and equipment must be kept in good working condition and serviced frequently to prevent leakage and emission of poisonous smoke etc.</li> <li>Switch off engines when vehicle is not operations</li> </ol>	Vehicle servicing records Reports of smoke emissions from machinery	Management or Site Manager
<b>Handling, Storage and Disposal of hazardous material</b>	Prevent pollution from hazardous materials such as fuel, oil and lubricants	1. Abide to the Draft Pollution Control and Waste Management Bill, Public Health Act No. 11 of 2007, Water Act No, 54 of 1956 and the Petroleum Product and Energy Act No, 13 of	Non-Compliance reports from organs of state	Management or Site Manager

Environmental Social Aspect	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
		<p>1990.</p> <p>2. There must be drums on concrete bunds to contain waste/used oil and lubricants.</p> <p>3. Ensure all vehicle are well service and leak inspection are done</p> <p>4. Provide drip trays to stationary vehicle</p> <p>5. Servicing of vehicle must be done at an approved site</p> <p>6. Re-fuelling, oil replacement must be done on concrete bund</p> <p>7. Storage of fuel, oil and lubricants must be kept on bunded structure</p>	<p>Visual Inspection</p> <p>Visual Inspection</p> <p>Visual Inspection</p> <p>Visual Inspection</p> <p>Visual Inspection</p> <p>Visual Inspection</p>	

Environmental Social Aspect	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
		<p>8. Bund and concrete slabs should be installed at each point where oils and lubricant are likely leak.</p> <p>9. If an oil leak occur, collect the contaminated soil, store in appropriate container and dispose of at appropriate waste disposal site (e.g. Municipal disposal site)</p> <p>10. Contaminated soils must be collected and disposed of at appropriated municipal disposal site</p>		
<b>Handling, Storage and Disposal of non-hazardous waste</b>	Proper disposing of welding, joinery and various construction and operational waste. These	<ol style="list-style-type: none"> <li>1. Non-hazardous waste must be disposed of at an approved site</li> <li>2. All recyclable material must be</li> </ol>	Visual Inspection	Management and Site Manager

Environmental / Social Aspect	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
	will include, steel etc.	transported to recycling companies		
<b>Domestic Effluent</b>	Adequate management of household sewage	<ol style="list-style-type: none"> <li>1. Ensure domestic effluent from ablution facilities must be disposed of by trucks regularly to the waste treatment plant.</li> <li>2. Abide to relevant laws and regulation</li> </ol>	Visual Inspection	Management and Site Manager
<b>Water Pollution</b>	Prevent surface and ground water pollution	<ol style="list-style-type: none"> <li>1. A dirty water collection system must divert water to a settlement pond that would be re-used in mine operations, such as dust suppression measures.</li> <li>2. Oils, fuel and lubricants must be handled as stated above</li> </ol>	Visual inspection	Management and Site Manager

**SECTION D: ENVIRONMENT**

**Table 5.2: Environmental Mitigation Measures to be implemented**

Aspect	Objective	Proposed Mitigation Measure	Monitoring Indicator	Party responsible
Water Resource Availability	The area receive less rainfall and conservation of underground water is eminent	<ol style="list-style-type: none"> <li>1. Obtain a water abstraction permit from Ministry of Agriculture, Water and Forestry;</li> <li>2. At the commencement of the project, establish the water table baseline for continuous monitoring of the water table;</li> <li>3. Ensure all used water are recycled and reused in the mining operations;</li> <li>4. Construct a water pond that would harvest rain water, and all rain water in the quarry pit must be well stored</li> </ol>	<p>Borehole monitoring of the water table levels.</p> <p>Visible water harvesting pond</p> <p>Recycling plant/operation</p> <p>Water Permit</p>	Management and Site Manager

Aspect	Objective	Proposed Mitigation Measure	Monitoring Indicator	Party responsible
		<p>and used;</p> <p>5. Implement measures of ground water infiltration to enable fast recharge of underground water in the catchment area</p> <p>6. Water for domestic use must be recycled for use in the mine processes</p>		
<b>Biodiversity conservation</b> <b>Flora</b>	Protect trees and other plants and only remove trees when necessary	<p>1. Only remove trees at the pit area</p> <p>2. Bigger trees at the stock yards and waste rock area must not be removed</p> <p>3. Do not plant alien trees</p> <p>4. Don not harvest fire wood</p>	Inspection report	Management or Site Manager
<b>Fauna</b>	To protect wild animals and livestock	1. Do not kill any animal, unless it is a threat to human life.	<p>Visual Inspection</p> <p>Report on poaching</p>	Management or Site Manager

Aspect	Objective	Proposed Mitigation Measure	Monitoring Indicator	Party responsible
		<ul style="list-style-type: none"> <li>2. There must be zero tolerance to poaching of any wild animal or livestock in the area.</li> <li>3. No weapons can be taken to the mine</li> </ul>		
<b>Lights Vs. Wildlife</b>	To preserve the natural environment at night, and to prevent scaring animals away	<ul style="list-style-type: none"> <li>1. There must be no open light during the night.</li> <li>2. All pole lights must face downwards into the mine area</li> </ul>	Visual Inspection	Management and Site Manager
<b>Visual Impacts</b>	To prevent an eye sore to the tourism industry	<ul style="list-style-type: none"> <li>1. After mine closure, buildings and structures must be dismantled and ensure adequate rehabilitation</li> <li>2. All waste rock must be disposed of into the quarry pit</li> </ul>	Visual Monitoring	Management



## SECTION E: HERITAGE AND ARCHEOLOGICAL SITES

**Table: 5.6: Archaeology and Heritage Mitigation Measures**

Environment / Social Aspect	Objective	Proposed Mitigation Measure	Monitoring Indicator	Responsibility
Heritage Resources / artefacts	Preserve Heritage	<ol style="list-style-type: none"> <li>1. Workers must be go through an induction course of the possible archaeological find possible in the area</li> <li>2. Establish a “Chance Find Procedure” where if any archaeological finding (Heritage rock painting and drawings), human remains or artefacts) during site activities is encountered;               <ol style="list-style-type: none"> <li>a. The activity must be stopped immediately and the operation manager of that activity be informed</li> <li>b. The manager oversee the cordoning off the area with</li> </ol> </li> </ol>	Sighting report/s of heritage resources / artefacts	Management or Site Manager

Environment / Social Aspect	Objective	Proposed Mitigation Measure	Monitoring Indicator	Responsibility
		<p>a danger tape and take appropriate records and picture</p> <p>c. The manager must immediately report the findings to the National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461).</p> <p>d. No artefacts must be removed or be interfered without prior authorisation from the Namibian National Heritage Council (NHC)</p>		

## SECTION F: SOCIO ECONOMIC

**Table 5.7: Social Economic Mitigation Measures**

Environmental / Social Aspects	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
Employment opportunities for Locals	Promote benefits to the local and marginalised community	<ol style="list-style-type: none"> <li>1. Recruit locals for unskilled labour</li> <li>2. Where possible, procure materials from local suppliers</li> <li>3. Abide to the labour laws</li> </ol>	Employee structure and proportion of local employment	Management or Site Manager
Alcohol and Drug use	Prevent alcohol and drug use	<ol style="list-style-type: none"> <li>1. Ban the use of alcohol and drugs at work place</li> <li>2. Teach employees about dangers alcohol and substance abuse</li> <li>3. All employees must be screen with the breathalyser to avoid intoxicated personnel on site</li> </ol>	Drunk / Misbehaving employees  Breathalyser report  Monitor presence of alcohol at the construction site	Management or Site Manager
Working hours	Adhere to the Labour Act No. 11 of 2007	<ol style="list-style-type: none"> <li>1. Operate within the prescribed working days and hours as per the Namibian Labour</li> </ol>	Verification of working hours against the labour Act	Management or Site Manager

Environmental / Social Aspects	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
		laws and regulations		
HIV / AIDS	Provide HIV / AIDS awareness to employees	<ol style="list-style-type: none"> <li>1. Provide HIV / AIDS awareness at induction</li> <li>2. Avail Condoms at the mine site, especially at secluded/secretive areas</li> </ol>	Availability of condoms at construction site	Management or Site Manager

## 6. CONCLUSIONS AND RECOMMENDATIONS

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Like any other resource extraction industry, it is expected that the construction and operation of the proposed mining operation would alter physical landscape of the environment with pits and waste rocks dumps. In many cases, these open pits, waste rocks may be an eye shore especially to the tourism industry. However, there are no tourism activities at areas near the mine, further, the overburden shall be backfilled into the mine pit after its exhausted.

Not many environmental impacts arise from the proposed mining operation. The only impact which can potentially cause detrimental impact on the environment in the long term is the potential introduction of pollutants to the surrounding environment. This can be addressed by strictly adhering to the mitigation measures recommended in the Environmental Management Plan. Other minor areas of concern such as noise and occupational health issues can be addressed through proper housekeeping.

It can thus be concluded that this project does not cause any significant impacts. Most of the impacts identified for the proposed mining operations are generic concerns associated with the mining activities which can be satisfactorily mitigated through the full implementation of the Environmental Management Plan (EMP). More importantly, the mine is expected to provide the much-needed employment especially to the locals and boost the economy of Karibib town.

It is therefore recommended that this project be issued with an Environmental Clearance on condition that the provisions of the Environmental Management Plan are fully implemented.

## 7. REFERENCES

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## **8. APPENDICES**

### **APPENDIX A: CV OF ENVIRONMENTAL ASSESSMENT PRACTITIONER**

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