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Environmental Management Plan (EMP):

The Proposed Quarrying and Crushing of Quartzite Rock for the Production of Construction Aggregates on Mining Claim 72245 in the Khomas Region, Namibia

(FINAL)

MEFT Application No: APP - 002139

Proponent: Eagle Focus Investment CC

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DOCUMENT INFORMATION

DOCUMENT TITLE: ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE PROPOSED QUARRYING AND CRUSHING OF QUARTZITE ROCK FOR PRODUCTION OF CONSTRUCTION AGGREGATES ON MINING CLAIM 72245 IN THE KHOMAS REGION, NAMIBIA

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LIST OF ABBREVIATIONS AND MEANINGS

CC	Close Corporation
CFP	Chance Finds Procedure
COVID-19:	Coronavirus disease (COVID-19) an infectious disease caused by a newly discovered coronavirus.
DEAF	Department of Environmental Affairs and Forestry
DTH:	Down-The-Hole drilling
EA	Environmental Assessment
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
ESA	Environmental Scoping Assessment
I&APs	Interested and Affected Parties

MAWLR	Ministry of Agriculture, Water & Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
MURD	Ministry of Urban and Rural Development
MWT:	Ministry of Works and Transport
NHC	National Heritage Council of Namibia
OGGC	OMAVI Geotechnical and Geo-environmental Consultants cc
PPE	Personnel Protective Equipment

1 INTRODUCTION

1.1 Brief Project Background and Location

To fulfil their operation mission in producing durable construction aggregates, Eagle Focus Investment CC (hereinafter referred to as the *Proponent*) a 100% Namibian-owned and managed company proposes to undertake quarrying and crushing of quartzite rock on Mining Claim 72245 in the Khomas Region. The Mining Claim (MC) 72245 is located approximately 40 km east of Windhoek and about 4 km south of the national B6 tarred road between Windhoek and the Hosea Kutako International Airport. The MC covers a surface area of area of 17 hectares (ha). The Mining Claim overlies and is wholly owned by the Proponent, with the primary targeted commodities being industrial minerals.

The project area is entirely underlain by rocks belonging to the Damara Super-group i.e. the Aus Formation of the Hakos Group covering mostly the southern and southwestern parts of mining claim 72245. The remaining part of the claim area is covered the Ondekaremba Member (Durachaus Formation) of the Nosib Group. The Hakos Group is dominated by siliciclastic rocks including quartzites, graphite schist, mica schist, conlomerate and diamictites. Subodinate carbonate and amphibolites are also present. The Nosib Group forms the base of the Damara Supergroup and consists of feldspathic quartzites with localized basal conglomerates, finer-grained clastic rocks and meta-evaporites. In the Claim area the Auas Formation turbiditic quartzites vary from massive to thickly bandded to thinly bedded turbidites. Sedimentary structures preserved in the quartzites are parallel mamination, flute marks, convolute bedding, gradded bedding and scoured bases. The Ondekaremba Member consists of pebble-bearing schists on uncertain stratigraphic position. Upper and lower layers of the member are thrust planes.

The aggregates will be produced from the Auas Formation quartzite that is thrusted over the feldspathic schist of the Ondekaremba Member of the Durachaus Formation.

The area hosts soils that are shallow and susceptible to erosion during the rainy season

The locality map and the map showing Mining Claim 72245 and the farms it overlies are shown in **Figure 1** and **Figure 2** below.

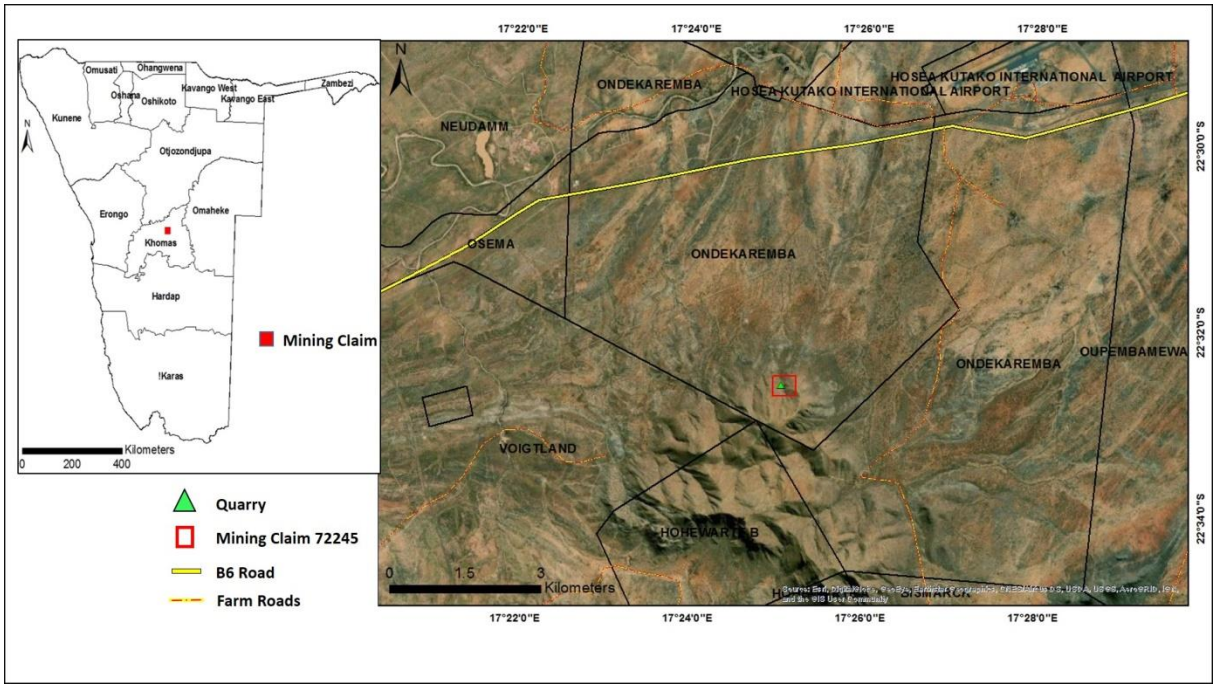

Figure 1: Locality map of MC 72245 in the Khomas Region

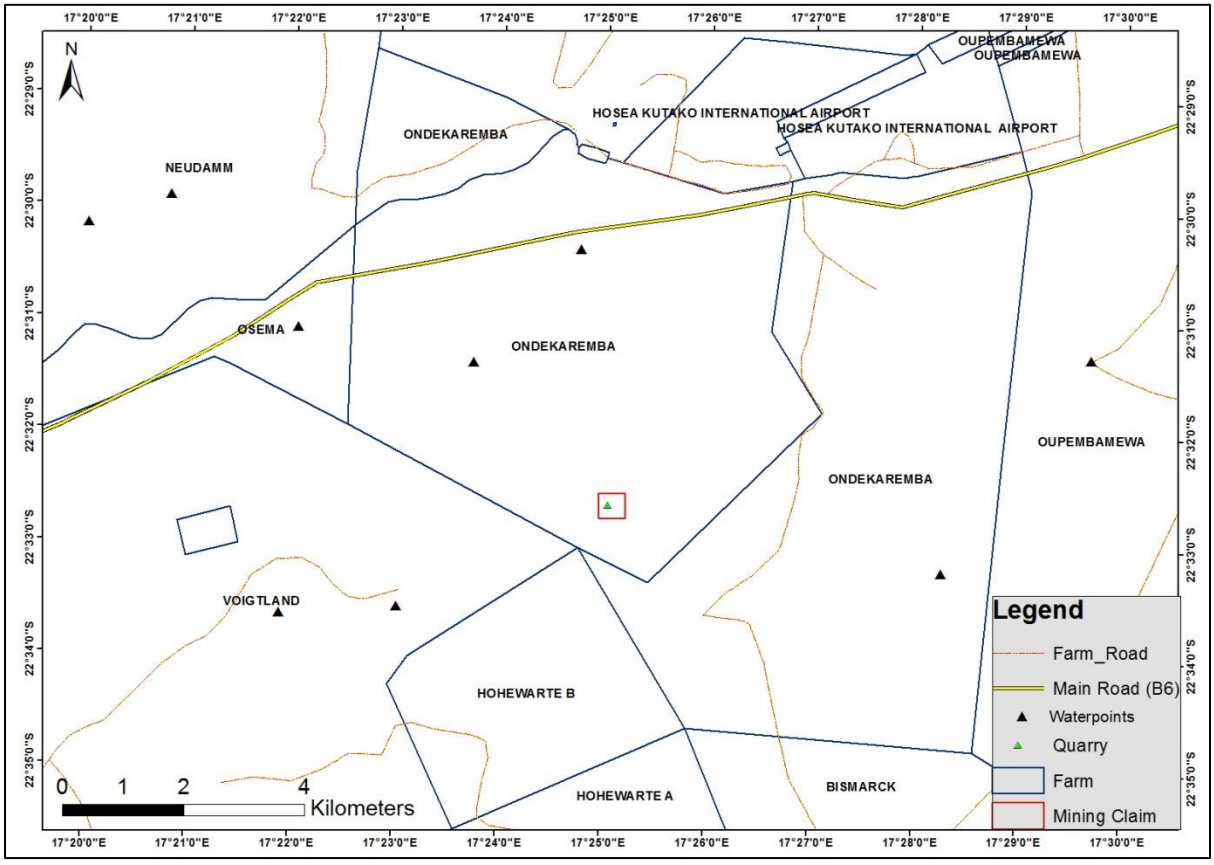

Figure 2: Location of MC 72245 on Farm Sonnleiten No. 78

Table 1-1: Approximate GPS Coordinates of MC 72245

EPL 7008	GPS Coordinates boundaries
Point A	22.54239°S / 17.41606°E
Point B	22.54586°S / 17.43264°E
Point C	22.54586°S / 17.42025°E
Point D	22.54233°S / 17.442031°E

1.2 Mining Claim 72245 Ownership and Land Tenure

Mining Claim 72245 has been pegged and partially registered in the name of Eagle Focus Investment cc, and overlies private Farm Sonnleiten No. 78 which belongs to Andrea Giel. The Mining Claim's application is pending approval by the Ministry of Mines and Energy (MME) and it is subject to an environmental clearance certificate (ECC) being issued by the Ministry of Environment, Forestry and Tourism (MEFT); a decision that will depend on the completeness of this assessment.

The current status of Mining Claim 72245 application is reflected on the Namibia Mining Cadastral Portal (upon searching) on this link https://portals.landfolio.com/namibia/ and as shown in **Figure 3** below.

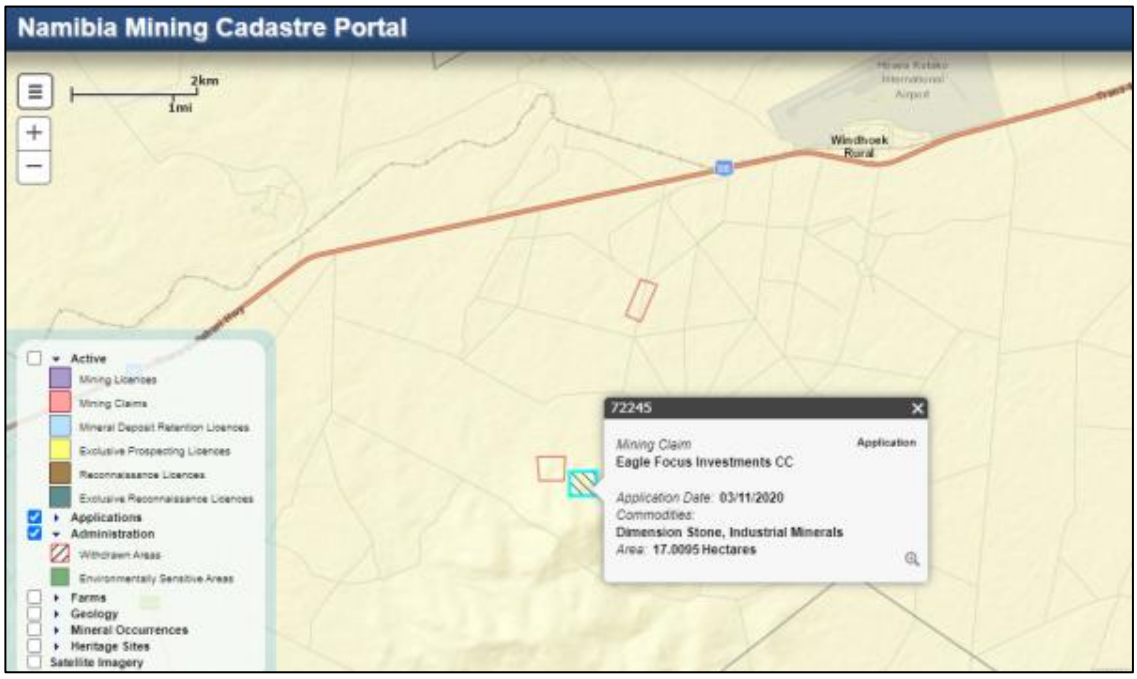

Figure 3: Current appearance of Mining Claim 72245 on the MME Portal (source: https://portals.landfolio.com/namibia/)

1.3 Purpose of the Environmental Management Plan (EMP)

Regulation 8 of the Environmental Management Act's (EMA) (7 of 2007) Environmental Impact Assessment Regulations (2012) requires that a draft Environmental Management Plan (EMP) be included as part of the Environmental Assessment (EA) process. The "draft" has context in this regard to emphasize that the document (i.e. the EMP) remains a working document which is to be updated continuously during the operational phase of the project to account for variations in site specific environmental conditions, the technology and quarrying/ crushing methods and technologies being used, and the market's demands as well as accommodate feedback or results from the recommended monitoring programs. A 'management plan' is defined as:

"…*a plan that describes how activities that may have significant environments effects on the environment are to be managed, mitigated, controlled and monitored.*"

The **EMP is a legally binding document to the project proponent** and is one of the most important outputs of the EA process as it synthesises all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the environmental assessment process and the required environmental management actions on the ground during project implementation and subsequent operations. **It is important to note that the custodian person or entity who contravenes the provisions of this EMP may face imprisonment and/or a fine.**

The purpose of this document is therefore to guide environmental management throughout the following phases of the proposed project:

- **Construction** - the period during which the project site is cleared and the ground is prepared to pave way for the construction of support infrastructures such as the mobile site office, access roads, stockpile bays, ablution facilities, the weigh bridge and quarry. This phase also includes the actual construction and installation of required services where necessary.
- **Operational phase** – during this phase, the proposed quarrying and crushing work take place in a responsible manner to produce durable construction aggregates which will then be transported to the market place.
- **Decommissioning and rehabilitation** – the period after which the quarrying and crushing activities will cease and the area is to be rehabilitated to restore the environment to a state that is as close as possible to the surrounding natural environment.

1.4 The Environmental Consultant

In accordance with the Environmental Management Act (2007) of Namibia and its Regulations of 2012, Eagle Focus Investments cc appointed OMAVI Geo-technical & Geo-Environmental consultants cc (hereinafter referred to as OMAVI Consultants or OGGC) as an independent environmental consultant to conduct an Environmental Scoping Assessment and submit the required documents as part of an application for an Environmental Clearance Certificate (ECC) to the Environmental Commissioner. This EMP is one of the required documentations to the ECC application.

This EMP was compiled on behalf of OMAVI Consultants by Evidence Kasinganetti (a qualified and experienced EAP).

1.5 Limitations of the Draft Environmental Management Plan (EMP)

The following limitations apply to this EMP:

- This report has been compiled at a scoping level with baseline information deduced from field observations/ evaluation and local literature, i.e. no specialist studies were done as part of this scoping assessment.
- OMAVI Consultants assumes that all the project technical information and data provided by the Proponent is correct and accurate, and that all necessary information has been disclosed which led to the development of this EMP.
- It is also assumed that the relevant information obtained from different local literature consulted is accurate and;
- This EMP 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 EMP and implementation of the proposed project that could substantially alter the baseline information and planned impact enhancement or mitigation measures

2 BRIEF PROJECT DESCRIPTION, ACTIVITIES AND PROCESSES

The proposed project broadly entails three (3) stages, namely: the development/ construction phase, the operational phase and the decommissioning phase. The development stage will entail surface clearing, the establishment of a small-scale quarry and a 180 tons per hour mobile crushing plant plus the erection/ installation of support infrastructures such as a stockpile bay, a small mobile weigh bridge, and a small container office with temporary ablution facilities. The operational stage will kick in as soon as the above facilities have been developed and will include ongoing quarrying and crushing of durable quartzite rock, and subsequent stockpiling and distribution of construction aggregates.

During the operational phase quarrying will involve a combination of overburden stripping, followed by controlled drilling and blasting of quartzite rock, and ultimately bulk excavation of loose boulders. The excavated material will then be hauled from the quarry to a tipping bin and primary crusher, from where further down-sizing and beneficiation starts.

At the primary crusher the material will be subjected to a processed called scalping, whereby fines and potentially deleterious material are removed in order to improve crusher efficiency. The undersize from the scalping process shall then be processed into a product of lesser quality, e.g. G6 and beyond. The oversize material shall be diverted to a different route where it will be subjected to a series of crushing stages, including impact, primary, secondary and tertiary crushing to produce a semi-final product. This semi-final product will then be sieved through a series of vibrating screens to get rid of deleterious fines.

The final product will then be stockpiled into individual heaps comprising aggregates of different sizes as listed below, ready to be dispatched and transported to the market place:

- 37.5 mm stone
- 19 mm stone
- 13 mm stone
- 9 mm stone and
- Crusher dust

Due to the massive quartzite deposit available on the concerned mining claim, the quarry is anticipated to have an active life of mine exceeding 20 years.

To ensure that potential adverse and positive impacts on the environment are lessened and enhanced, respectively, the proposed quarrying and crushing activities ought to be planned and implemented future decommissioning within the Mining Claim boundaries in mind. Accordingly, it is recommended that progressive / ongoing rehabilitation be carried out by the Proponent. This can be achieved through rock shading, partial backfilling and spreading of topsoil over mined out area. This will be done to ensure that the disturbed land sites are left close to their pre-disturbed state as much as possible.

Included in the rehabilitation and decommissioning is also the dismantling and removal of all site infrastructures related to the project.

2.1 Project Inputs

Clearing of the quarry site and associated working areas (e.g. processing plant area, stockpile bays, site office, emergency assembly bays, and a small workshop) as well as stripping of overburden will require the use of a wheeled front-end loader, an excavator, a bull dozer and a few dump or tipper trucks. On the contrary, the crushing process will be carried out using a combined set of Jaw and cone crushers, screens, and conveyor systems to produce approximately 180 tons/ hour of construction aggregates. The crushing plant, site office, workshop, and Weigh Bridge will all be powered by a diesel generator to be installed on site. Diesel for the power generator and all plant will be stored on site, on a 2500L to 3500L trailer mounted diesel tank. Water supply for domestic consumption and for the scalping or washing of raw material will be sourced from a single borehole to be drilled near the quarry site. Two 10 000L storage water tanks will be installed near the crushing plant to store abstracted water and/ or water harvested during the rainy season for production purposes. The anticipated daily water demand during the operational phase will vary between 1500L and 2500L, depending on numerous factors such as the amount of fines contained in the raw material. Water used during the production process will be recycled to ensure that abstraction from the planned borehole is minimized.

It is anticipated that between 10 and 15 people will work on the site during normal operations.

2.2 Project Outputs

The final products from the proposed quarrying and crushing activities will include the following:

- 37.5 mm stones
- 19 mm stones
- 13 mm stones
- 9 mm stones and
- Crusher dust

3 EMP IMPLEMENTATION AND RESPONSIBILITIES

The EMP has identified the Project Site Manager; Safety, Health and Environment (SHE) Officer and Public Relation Officer (PRO) as important roles to implement the environmental management plan for the proposed activities. It should be noted that in practice, however, these roles may be assigned to and performed by one person, especially for small-scale projects such as this one.

A list of specific responsibilities and duties to be undertaken under each position are provided below. It should also be noted that the above-mentioned roles are delegated roles and Eagle Focus Investments cc is ultimately responsible and legally compelled for implementing the EMP. Key responsibilities for other stakeholders are also listed below.

3.1 The Project Site Manager (or the Proponent)

This Manager, **who may also be the Proponent**, will be responsible for the following:

- Managing/overseeing the implementation of this EMP and ensuring that the EMP is updated regularly as more or new data and information is collected.
- Issuing fines to or formally disciplining individuals who contravene EMP provisions and if necessary, removing such individuals from site completely.
- Setting up and managing the schedule for the day-to-day activities; taking into account that daily safely briefs are held.
- Liaison with all relevant interested and affected parties/stakeholders.
- Ensuring all incidents are recorded, documented and reported to the relevant authorities.
- Undertaking an annual review of the EMP and amending the document when necessary.
- Ensuring that all permits required for the operation are obtained timeously and are available on site at all times. Such permits include the ECC, the water abstraction certificate, Oil storage certificate, and the blasting certificate.

3.2 Safety, Health and Environmental (SHE) Officer

The SHE Officer will be responsible for the following activities:

- Planning, conducting and signing off site inductions to the workers on-site and visitors to the worksite(s).
- Developing area-specific reference safety, health and environmental manuals for all work sites, as well as quick SHE checklists that workers and visitors/ contractors may use for quick specific job risk assessments.
- Recording all SHE related incidences on site.
- Ensure availability of all PPE on site
- Ensuring that the requirements of the EMP are carried out during applicable activities throughout the project life span.
- Continuously implement the monitoring programs outlined in the EMP.

3.3 Public Relation Officer (PRO)

The Public Relation Officer will be responsible for the following tasks:

- Liaising between the affected farmers (property owners) and/or occupiers of land and Eagle Focus Investments cc.
- Ensure effective communication with stakeholders (affected farmers or landowners or occupiers of land), media (if necessary) and the public.
- Managing public relations and dispute issues.
- Preparing and submitting public relations reports, if required.
- Collaborating with personnel and maintaining project-related open communication among personnel.
- Ensuring timely communication or notices of blasting schedules to interested and affected parties

3.4 Landowners and the affected Community

- Monitor implementation of the EMP
- Actively participate in stakeholder forums
- Make use of the grievances mechanisms to communicate issues to the Proponent and/ or to relevant authorities
- Monitor legal compliance
- Review performance reports
- Sanction poor performance and non-compliance where appropriate through directives, penalties and fines

3.5 Technical Staff and Consultants

- To safely and effectively monitor various technical parameters related to soil preservation/ protection; ground stability; employee/ contractor health; water resources management; waste management; and mechanical designs of various equipment on site.

3.6 Archaeology: Chance Finds Procedure (CFP) Implementation Roles

The following personnel have been assigned responsibilities as per the Chance Finds Procedure developed by the Namibian National Heritage Council:

3.6.1 Machine Operator

- Must exercise due caution if archaeological remains or suspects of such are found
- Must immediately stop any earthworks if suspect remains are discovered and immediately report to the Site Foreman

3.6.2 Foreman

- Must secure such a site and advise management timeously
- Must determine safe working boundary and request inspection

3.6.3 Independent Archaeologist

- Must inspect, identify, advise management, and recover remains.

The Proponent should assess these commitments in detail and should acknowledge their obligation to the specific management actions detailed in the Tables of the following sections.

4 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN ACTIONS

This chapter presents a list of legal requirements in terms of permitting and licensing for certain project activities and then moves on to document impact enhancement and mitigation measures (management plan actions) related to this project.

The aim of the management plan actions laid provided in Tables below is to enhance potential benefits and avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce or manage the significance of these impacts.

These management plan actions are a ''translation'' of mitigation measures recommended to manage the potential impacts identified in the project's Environmental Scoping Report.

4.1 Applicable Legislation: Authorisation (Permits and Licenses)

This section covers information on the legal obligations (legislations, policies, and guidelines) that governs certain project activities, where permitting and/or licensing may be required from different applicable regulatory authorities - Please refer to **Table 4-1** below. The full list and description of the legal framework (where permits are required or not) is presented in the Scoping Report.

Table 4-1. Applicable legislations in terms of permitting or licensing requirements for the proposed activities

Legislation	Relevance to Project	Contact Details for obtaining Permits
Environmental Management Act 2007 Environmental Impact Assessment (EIA) Regulations (EIAR) (GG No. 4878)	Activities listed in Government Notice (GN) No. 29 of GG No. 4878 require an Environmental Clearance Certificate (ECC). The amendment, transfer, or renewal of the ECC (EMA S39-42; EIAR Regs19 & 20). Amendments to this EMP will require an amendment to the terms and conditions of the ECC. **The ECC needs to be renewed every 3 years.**	**Mr Damian Nchindo (Ministry of Environment, Forestry and Tourism's Department of Environmental Affairs and Forestry (DEAF) – Chief Conservation Scientist)** **Tel: (061) 284 2701**
The Water Act 54 of 1956 The Water Resources Management Act No. 11 of 2013 (unpromulgated)	The Water Act 54 of 1956 was formulated to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes; to make provision for the control, in certain respects, of the use of sea water for	**Mr Franciskus Witbooi (Deputy Director: Water Policy and Water Law Administration.** **Tel: (061) 208 7158**

Legislation	Relevance to Project	Contact Details for obtaining Permits
	certain purposes; for the control of certain activities on or in water in certain areas. **Provision for a Groundwater abstraction and use permit for commercial use to be applied for and obtained from the Department of Water Affairs (DWA): Directorate of Water Resources Management. When issued, Proponent, the permit should be renewed as required (as stipulated in therein).**	
Mineral Prospecting & Mining Act (Act No. 33 of 1992)	Section 38 (1): Applications for renewal of registration of EPLs. The Proponent should ensure that all the necessary permits/authorisation for activities performed on the EPL are obtained from the Ministry of Mines & Energy (MME)'s Mine Directorate. Section 54(2): details provisions pertaining to the decommissioning or abandonment of a mine / explored sites because of related activities.	**Mr Erasmus Shivolo (Mining Commissioner)** **Tel: 061 284 8167** **E:** Erasmus.Shivolo@mme.gov.na
	Under this Act (Section 51 (1a)), 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. **The Mining Claim must be renewed with MME every 3 years**	**The Proponent should on time enter into and sign access and land use agreement (consent) with respective affected farm owners or representatives of the occupiers of land.**
Local Authorities Act No 23 of 1992	The City of Windhoek (Windhoek Municipal Council) is the responsible Local Authority of the affected project site area, and therefore they should be consulted in compliance with the Act and its Regulations, as relevant to the proposed project. Additionally, regulations specific to the City of Windhoek shall be adhered to	**Contact Person Ms. Mary-Anne Kahitu (Manager: Health & Environment Services)** **Tel: 061 290 2485** *With all official correspondence addressed to the office of the Chief Executive Officer (P. o. Box 59 Windhoek)*
Explosives Act (Act 26 of 1956)	Regulations under this Act stipulate that a Blasting Certificate is issued prior to any blasting work	**Mr. Mathews Amunghete (Chief Inspector of Mines)** **Tel: 061 284 8254** **E:** Mathews.Amunghete@mme.gov.na
Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations	Provides for the control of traffic on public roads and the regulations pertaining to road transport, including the licensing of vehicles and drivers. **A site access road permit from the main road (B6) should be applied for and obtained from the Roads Authority and conditions set therein to be compiled with.**	**Mr Elina Lumbu (Roads Authority – Specialist Road Legislation)** **Tel.: (061) 284 7027**

Legislation	Relevance to Project	Contact Details for obtaining Permits
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	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". If there is fuel stored or is intended to be stored on site, the relevant petroleum products storage licenses/permits should be applied for from the Petroleum Affairs at the Ministry of Mines and Energy	**Carlo Mcleod (Ministry of Mines and Energy: Acting Director – Petroleum Affairs** **Tel.: (061) 284 8291** **E: Carlo.McLeod@mme.gov.na** **OR** **Mr. Tupa Iyambo (Chief Petroleum Inspector)** **Tel: 061 284 8300** **Email:** **Tupa.Iyambo@mme.gov.na**
Forestry Act (No. 12 of 2001)	Permits are required for the removal of protected plants species.	**The nearest Forestry Office (Ministry of Environment, Forestry and Tourism)** **Mr Joseph Hailwa (Director: Forestry), Tel: (061) 208 7663**
Nature Conservation Ordinance No. 4 of 1975 (as amended)	Permits are required for the removal of protected plants species.	
National Heritage Act (Act No. 27 of 2004)	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. Should any objects of heritage significance be identified during the site clearing and or quarrying work, the work must cease immediately in the affected sites and **the necessary steps taken to seek authorisation from the Council**.	**Mrs. Erica Ndalikokule (Acting Director) – National Heritage Council of Namibia** **Tel:(061) 301 903**
Labour Act 11 of 2007Health and Safety Regulations (HSR) GN 156/1997 (GG 1617).	Adhere to all applicable provisions of the Labour Act and the Health and Safety regulations in terms of employee benefits, occupational health and safety, dispute resolution measures, etc.	**No permit is required, but adherence to the Act's Relevant Regulations is highly recommended to prevent labour protests and legal actions related to labour issues.**
Drainage Regulations of the Windhoek Municipality Council	The Drainage Regulations of the Windhoek Municipality Council foster for safe disposal and management of sewage and wastewater in order to prevent deterioration of both surface	**Contact Person Ms. Mary-Anne Kahitu (Manager: Health & Environment Services)** **Tel: 061 290 2485**

Legislation	Relevance to Project	Contact Details for obtaining Permits
	and groundwater bodies. A site specific wastewater and effluent management procedure shall be drafted to outline how any waste water from the crushing plant or from drilling activities will be managed, and released into the natural environment.	*With all official correspondence addressed to the office of the Chief Executive Officer (P. o. Box 59 Windhoek)*
Waste Management Regulations of Windhoek Municipal Council	The Proponents should familiarize themselves with the specific City of Windhoek's Regulations with regards to managing waste (both solid and liquid) on the project sites and where to dispose it. This will also entail the process to apply for permission to dispose off waste on designated Municipality landfill/waste sites within the municipality's boundaries such as the Kupferberg landfill site located west of Windhoek	**Contact Person Ms. Mary-Anne Kahitu (Manager: Health & Environment Services)** **Tel: 061 290 2485** *With all official correspondence addressed to the office of the Chief Executive Officer (P. o. Box 59 Windhoek)*
Health and safety: Public Health Act (No. 36 of 1919)	Section 119 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." This therefore requires the proponent to ensure that any possible nuisance in the form of noise, dust levels, visual impacts are limited to acceptable levels as provided for under the relevant regulations of this Act	The Proponents and all its employees should ensure compliance with the provisions of these legal instruments. **No permit or license required, but adherence to the Act's Relevant Regulations is highly recommended.**
Other relevant legal requirements (institutional/City of Windhoek) include: • Drainage Regulations of Windhoek Municipal Council (Sewerage and Drainage Regulations published under General Notice No. 312 of 11 November 2010) • Noise Control Regulations of Windhoek Municipal Council (General Notice No. 77 of 30 March 2006).		

4.2 Impact Enhancement/ Mitigation Actions AND Monitoring

The management plan actions for the enhancement of potential benefits and mitigation of potential adverse impacts are presented in **Table 4-2** below. Since there is quite an overlap in terms of impacts between the various phases of the project, the impacts have not been separated per phase of the project. The Table contains the following aspects:

- Environmental aspect and issues for which management actions are required;
- Proposed impact enhancement/ mitigation measures;
- Key performance indicators for monitoring success levels of management actions;
- Responsible person(s) for implementing the proposed management actions;
- Resources required for implementing management actions and monitoring and;
- Implementation timeframes for the proposed management actions.

Table 4-2. Management Plan Actions for the Development, Operational, and Decommissioning Phases of the Project

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
ADVERSE IMPACTS						
Blasting	-Uncontrolled flying rocks on aviation traffic and personnel -Repeated short-term high noise levels	-Blasting to be executed following appropriate design by competent blast engineer to ensure that blast holes are not overcharged -Give timely notice to Airport Safety division as well as to surrounding landowners on blasting schedules -Have a clear and strict site evacuation plan which must be followed prior to any blasting -Ensure that post blasting work in quarry only commences once dust levels in the area have subsided to threshold levels stipulated under the National Public Health and Safety Act -Adjust blast design periodically to suit geotechnical conditions encountered in quarry -Bi-annual environmental audits must cover this	-Record number of incidences related to flying rock damage -Run regular surveys on farmer satisfaction with respect to blasting nuisance -Keep a record of all blast designs and blasts executed	-Production Site Manager (holds overall responsibility) -Blast Engineer/ Contractor (2nd in charge) -Public Relations Officer -Health and Safety Officer	-Drill rig for drilling blast holes -Grievances logbook -Technical Staff (Geotechnical Engineer & Blast Engineer) -Explosives and blasting chemicals	Likely once every week, depending on production rate and product demand
Slope Instability	-Slope instability in quarry after heavy rains	-Monthly site inspections by a geotechnical engineer to assess stability of quarry slopes or walls, and recommend stabilization measures where necessary	-Presence, frequency and extent of ground cracks -General condition of quarry walls (is there	-Production Site Manager (holds overall responsibility) -Geotechnical	Technical Staff (Geotechnical Engineer)	Once every month and as and when signs of ground instability are detected/

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
			evidence of slumping, loose rocks at base on slope, over-hanging rocks)	Engineer/ Geotechnical Consultant (2nd in charge)		observed
Soils	-Destruction of soil structure through excavation and compaction works -Soil Erosion -Soil Contamination and Pollution	-Top soil overburden should be stockpiled in designated areas during both site development and quarrying to avoid erosion and mixing with unfertile subsoils -Use subsoils to backfill worked areas, and place fertile topsoil on top -Minimize disturbed footprint as much as practically possible at any given time by mining in blocks not exceeding 250m by 250m -Haul roads must have compacted drainage channels along shoulders covered with riprap (or possibly concrete lined) to minimize erosion -Avoid creation of new tracks to minimize soil compaction as much as possible. All traffic should stick to access roads provided and or meant for the project operations -Scoop up polluted soils and transport them to designated landfills in Windhoek such as Kupferberg Landfill -Enforce punishment for non-compliance in the form of disciplinary hearing -Soil conservation training to staff	-Record any evidence of new traffic tracks outside of designated access and haul roads by means of photographs -Record evidence of new erosion gullies (photographs) -Record evidence of soil contamination -Annual site wide evaluation on the effectiveness of erosion control efforts including erosion control structures - Monitor depth of soil profile and contamination levels every 6 months in areas on runoff	-Health and Safety Officer -Hired soil scientist	-Technical Staff (Soil Conservation Scientist to offer training and monitor depth profiles as well as contamination levels)	-Throughout the operational phase -Once every 6 months for monitoring depth of soil profile and contamination levels in areas of high runoff

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
Land Use	-Changes in land use due to creation of quarry and erection of site infrastructure	-Compensate affected farmers for lost agricultural land -Fence off access roads, quarry site and crusher plant site to minimize risk of vehicle-animal collisions	-Affected farmers effectively compensated -Sites fenced off	-Production Site Manager (holds overall responsibility)	-Funds or Equity to compensate affected farmers and acquire fencing material -Labour force to fence off sites	-Compensation can be once off or throughout the life of the operation -Fencing to be completed during site development and prior to production
Topography and Landscape	-Changes in topography and landscape	-Quarry must be developed in small blocks. -Partially backfill and landscape worked out blocks of the quarry to a slope as close as possible to the natural surrounding areas -Minimize disturbed footprint at any given time by limiting cleared site to that which is to be mined in the next 6 months -Have designated stockpile areas -Maintain one access road to and from the quarry and crusher site	-Annual site wide evaluation on the effectiveness of rehabilitation of worked out portion of quarry, spoil areas, stockpile areas; and the spatial extent of cleared ground at the quarry and crusher site. Recommended that at any given time cleared ground at crusher site must NOT extent beyond 20m from the edge of the crushing plant.	-Production Site Manager (holds overall responsibility)	-Fund for ongoing site rehabilitation -Earthmoving plant to backfill worked areas in quarry; spread topsoil over worked out areas; and grade rehabilitated areas to acceptable slopes	-Ongoing throughout the operational phase of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
Vegetation	-Removal of vegetation during site clearing and quarrying -Destruction of vegetation/ habitats by veld fires, excessive dust and illegal firewood collection	-Minimize disturbed footprint as much as practically possible at any given time by mining in blocks not exceeding 250m by 250m -Before clearing each site hire an independent botanist to inspect the area for any protected plant species. If any identified, obtain removal permits from the Directorate of Forestry -Restrict movement of vehicle and machinery to existing roads and tracks to prevent unnecessary damage to vegetation -No onsite vegetation should cut or used for firewood related to the project's operations. The Proponent should provide firewood for onsite camping workers from authorized firewood producer or sellers -Draft a restoration plan -Encroacher bush cut during site development may be stockpiled and sold to local charcoal producers	-Keep record of names of all protected plant species identified by independent botanist prior to clearing any site -Monitor the following parameters for all rehabilitated areas: % vegetative cover; vertical structure of vegetation; plant health; richness and abundance of indicator species; type and extent of erosion; presence and extent of invasive alien plants -Record all illegal activities related to destruction of vegetation such as illegal cutting of trees	-Production Site Manager (holds overall responsibility) -Environmental Health and Safety Officer	-Funds for flora restoration program -Technical Consultants to help with monitoring restoration progress	-Ongoing throughout the operation of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
Waste Management	-Solid waste pollution due to littering and storage of domestic and industrial (explosives, scrap metal, empty containers, conveyor belts, used tyres) waste on site -Solid waste pollution due to stockpiling of waste rock, cleared vegetation -Waste pollution due to usage and storage of reagents, fuels and lubricants on site	-A site specific Solid Waste Management procedure should be drafted during site development and updated as the site developed and as quarrying progresses -A record of all waste generated and disposed from site is to be kept on site -All industrial solid waste should either be disposed off at the Kupferberg Landfill in Windhoek, or be sold off to used equipment dealers or recycled periodically, or simply given away. The necessary permits should be obtained from the City of Windhoek. All industrial waste should be stored in secure fenced off areas -Used tyres may be painted and used to mark the edges of roads, bends and accidental blind spots -Waste separation at source will be enforced by availing clearly labelled or differently coloured general waste (paper, plastic, organic waste) rubbish bins at all working areas. These must be emptied weekly at the	-Site wide evaluation of the general condition of all waste storage sites must be conducted as part of the bi-annual environmental audits -A register of all waste generated on site is kept on site -All waste disposal permits from relevant authorities are available on site	-Environmental Health and Safety Officer	-Funds to acquire waste storage bins/ drums; and transport all waste from the site -Funds to hire an independent environmental consultant to conduct bi-annual environmental audits	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
		nearest registered waste dumping site -All hazardous waste such as oil drums and grease should be stored in secure fenced off and overhead covered areas. Such areas must also have a concrete floor for spillage containment purposes. Used oils and grease must sold to recycling companies -Poor quality waste rock is to be stockpiled in designated areas away from runoff pathways, and must be subsequently used as backfill in the quarry -Ensure that sewage from portable sanitation facilities complies with the relevant Windhoek Municipality Council regulations				
Indigenous Fauna	-Forced migration of fauna due to physical disturbance/ destruction of habitats, increased noise levels and increased dust in the are	-Minimize impact on animal migration by having culverts below roads -Minimize animal fatalities from collisions with vehicles by fencing off access and haul roads as well as the crusher site -Site personnel shall refrain from	-Keep records of all illegal hunting activities; vehicle-animal collision incidences; animal poisoning through consumption of hazardous substances -Do animal counts at the quarry and crusher	- Environmental Health and Safety Officer	-Funds to hire an independent environmental consultant to conduct bi-annual environmental audits	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
	-Impended free movement of fauna due to physical obstructions (fences, quarry, etc) -Threats from illegal hunting and possible poaching	killing/poaching or snaring or intentionally disturbing local animals that may be found on and around the working areas. Personnel are not allowed to kill or in any way disturb local livestock -All wild animals found to be causing trouble at the working areas are to be reported to the relevant directorate at the MEFT, and shall only be removed from site by authorized personnel from such directorates	site every 6 months as part of the bi-annual environmental audit			
Air Quality	-Dust generated from drilling, blasting, bulk excavations and haul/ access roads -Dust generated from crusher	-Apply a thin layer of crushed aggregates as cover on access and haul roads to minimize dust generation -Locate stockpiles the predominant wind direction - Cover vehicles carrying dusty materials to prevent materials being blown from the vehicles -Set speed limits to minimize the creation of fugitive dust within the project boundary -Limit vehicle idling and keep vehicles well maintained to minimize particulate and gaseous emissions -Where practical plant trees and vegetation outside the quarry limits to minimize	-Monthly dust level monitoring by installing dust buckets down-wind from the crusher and quarry -Continuous monitoring for ambient dust/ particulate (PM10 and PM2.5) -All employees must do a mandatory health check every 6 months to monitor impact on their respiratory systems	- Environmental Health and Safety Officer	-Funds to implement the dust and air quality monitoring program, including the bi-annual personnel health checks -Technical Specialists (Air quality)	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
		spreading of dust to surroundings -Material transfer points in the crusher plant must have spray bars and enclosures installed to ensure dust emissions from the crushing and conveying systems are properly managed to meet emissions and ambient air quality targets -The production drill to be used must be fitted with dust capture equipment -Reduction in unnecessary traffic volumes; -Use of wet suppression during drilling -All personnel onsite to wear appropriate PPE				
Noise and Ground Vibrations	-Increased nuisance due to increased noise and ground vibrations from drilling, blasting and excavation works -Increased nuisance	- During construction, when the intensity of works is anticipated to be variable, monthly noise surveys will be undertaken at the receptors closest to the active work areas. Each receptor will be monitored for a period not less than 24 hours and the results	- Measured levels will be recorded in a log and checked for compliance	- Environmental Health and Safety Officer	-Funds to implement the noise and vibration monitoring program, including purchasing of simple equipment	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
	due to increased noise and ground vibrations from crusher	compared with the threshold values stipulated under the relevant SABS standard - During the operations phases, when noise levels are anticipated to be less variable, the frequency of monitoring will be reduced to annual surveys, with spot-checks of 1 hour's duration during the daytime and night-time at receptors conducted monthly. Additional 24-hour surveys will be conducted should noise complaints be received -Vibration surveys will be completed in accordance with the method set out in an appropriate Standard, such as BS 5228. The frequency of the surveys will be determined by the blasting schedule, and receptors will be installed at or closest to permanent structures in the area -Project employees will be trained to operate a sound level meter and how to undertake reliable environmental noise measurements.	with the evaluation criteria stipulated under appropriate standards such as SABS or BS 5228		-Technical Specialists (noise and ground vibrations)	

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
		-A communications plan will be enacted to communicate the results of the monitoring to nearby residents and to record and investigate any noise complaints. -Use specific blasting plans, correct charging procedures and blasting ratios, delayed/micro delayed or electronic detonators, and specific insitu blasting tests (the use of down hole initiation with short-delay detonators improves fragmentation and reduces ground vibrations); Undertake blast design, including a blasting-surfaces survey, to avoid over-confined charges, and drill-hole surveys to check for deviation and consequent blasting recalculations; -Monitor ground vibration at sensitive				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
		receptors and evaluating any impact on structures should they occur				
Surface Water Resources	-Pollution of surface water resources through hydrocarbon spillages in runoff areas and contamination of small streams in the area as a result of inadequate sanitation facilities resulting in reduced water quality	- Install and maintain efficient oil and grease traps or sumps at refuelling above-ground fuel storage tank, workshops, and containment areas, and making spill kits available with emergency response plans -Attenuate surface runoff by using on-site storage and water management infrastructure (e.g. storage sumps, low gradient ditches, clean water diversion ditches) -Construct and maintain containment facilities for hazardous materials -Install adequate portable toilets fitted with well-sealed septic tanks -Divert clean water from quarry, crusher and access/ haul road sites through construction of gently sloping diversion ditches	-Implement monthly surface water quality monitoring. Target levels to comply with the City of Windhoek's portal and effluent targets	- Environmental Health and Safety Officer	-Funds to implement the monitoring program -Technical Specialists (Water Specialist)	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
Groundwater Resources and use	-Pollution of groundwater resources -Abstraction may result in lowering of the water table in the area	-The proponent must implement contamination mitigation measures as for surface water impacts, especially in the vicinity of the quarry, crusher and, oil storage tank -Seal off unused boreholes -Monitor groundwater levels in abstraction wells/ boreholes to assess potential effects of dewatering on groundwater levels as well as on borehole yield with time	-Implement monthly surface water quality monitoring. Target levels to comply with baseline water quality -Monitor flow rates by installing flow meters in boreholes	- Environmental Health and Safety Officer	-Funds to implement the monitoring program -Technical Specialists (Water Specialist)	Ongoing throughout the life of the quarry and crusher
Occupational Health and Safety	-Short to Long-term safety effects -Short to Long-term health effects from dust and noise	-Proponent must avail adequate and appropriate PPE to all workers and visitors -Timeously recording and reporting of all health and safety incidences -Develop an MOU with the Local Healthcare Centres in Windhoek for service provision to the local workforce -Enforcement of speed limits and sanctions for any personnel found in violation of speed	-Regular health screening of workers -Bi-annual health and safety audits done	-Production Site Manager (holds overall responsibility) -Environmental Health and Safety Officer	-Funds to acquire health and safety related equipment; and to pay for employee medical services -First Aid training for at least 2 personnel at each work site	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
		limits, including senior staff and contractors' and sub-contractors' employees -Appropriate signalling of moving heavy machinery -All drivers to be given safety education focussing on speed and conflicts between pedestrians and animals -Proper screening of appointed security personnel to ensure they were not implicated in human rights abuses in the past				
Farm Security	-Security threats to farmers due to increased/ easy farm access	-Appoint a security company to safeguard entrance to the site as well as in and around the site -Install flood light at the crusher site to facilitate visibility during the night	-Record and report (timeously) all theft, injury related incidences	-Production Site Manager (holds overall responsibility)	-Funds to procure security services	Ongoing throughout the life of the quarry and crusher
	-Visual impact due to lighting at night -Visual impact from B6 road due to	-Practice rock bliding in quarry -Only floods at the crusher site must be left on at night	-	-Site Foreman	-	-

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
Visual Damage	visible quarry and support infrastructure					
Heritage/ Archaeology	-Possible destruction of unforeseen heritage/ archaeological sites	-Prior to excavating each 250m by 250m block, conduct a visual inspection of the site for any features of archaeological/ heritage/ religious importance. This must be done by an independent person trained in heritage resource identification -Apply the chance find procedure documented above	-Records of all archaeological/ heritage/ religious sites or features identified	-Production Site Manager (holds overall responsibility)	-Technical Specialists (Historian/ Archaeologist)	Ongoing throughout the life of the quarry and crusher
Public Disputes/ Grievances	-Risk of compromised relationships between Project owners and farm owners	-Have a complaints logbook. Monitor community grievances and provide feedback	Monitor community grievances and provide feedback	-Production Site Manager (holds overall responsibility)	-	Ongoing throughout the life of the quarry and crusher
POSITIVE IMPACTS						
Employment and technical skills transfer	-Employment opportunities for youth from Windhoek -Transfer of technical skills	-Regular and accessible (transparent) dissemination of the human resources and employment policy to interested and affected communities -Complaints of inequality and discrimination	-For every key job occupied by a foreign national evaluate skills learned by local under-study at the end of each financial year	-Production Site Manager (holds overall responsibility) -Public Relations Officer	-On the job training resources	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
		in job selection and in jobs -Ensure that every job occupied by a foreign national has a local under-study to ensure on the job training of the under-study				
Local Empowerment and Procurement Opportunities	- Empowerment of Previously Disadvantaged Persons -Opportunities for local companies to procure support services such as cleaning, marketing, cooking, canteen services, and supply of spares	-Procure support services (cleaning, cooking, machinery maintenance, security and product transportation services from local previously disadvantaged contractors)	-Every 6 months review contracts awarded for support services to assess extent of local previously disadvantaged contractors	-Production Site Manager (holds overall responsibility) -Public Relations Officer	-	Ongoing throughout the life of the quarry and crusher
Financial benefits to Landowners	-Financial benefits to farm owners through surface lease fees	-Ensure affected landowners are reasonably compensated either in cash or through equities or through surface rentals	-Evaluate mode and magnitude of compensation during the bi-annual environmental audits	-Production Site Manager (holds overall responsibility)	-Funds for compensation	Once off
Revenue for Government	-Revenue collection for government through taxes and Mining Claim License levies	-The proponent must pay all relevant taxes applicable under the constitution of the Republic of Namibia	- Evaluate mode and magnitude of compensation during the bi-annual environmental audits	-Production Site Manager (holds overall responsibility)	-	Ongoing throughout the life of the quarry and crusher

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeframe of management action(s)
EMP implementation and training	Lack of EMP awareness and implications thereof	An EMP non-compliance penalty system should be implemented on site. The Proponent should appoint an SHE Officer to be responsible for managing the EMP implementation and monitoring.	All required Plans and systems are compiled and in place Safety, Health and Environmental (SHE) Officer is appointed	Proponent	Records of EMP implementation Plans and Systems	Pre-exploration (project activities)

4.3 Rehabilitation Measures After Site Closure

Table 4-3 provides the rehabilitation and closure measures to be implemented at closure of the quarry and crusher to meet the requirements of the Environmental Management Act.

Table 4-3. Rehabilitation Measures After Site Closure

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
Revegetation	-All surface infrastructure areas affected by the project will be re-vegetated using local plant species. The following revegetation measures will be implemented over the disturbed site: Prepare surface rehabilitation areas for the natural establishment of vegetation by undertaking the following: • Rip disturbed footprint to a depth of approximately 500 mm with suitable agricultural equipment to alleviate compaction; • For areas that are heavily compacted (hard stands, access	- Exotic weed species are not observed to be elevated in abundance when compare to the regional setting as reported by a trained independent botanist -Monitoring sites are established on site (1 every 10 ha) and surrounding sites (at least four representative control sites). Flora species diversity in rehabilitated areas are representative of control sites. Vegetation density of monitoring sites are at least 80% when compared to the average of the control sites.

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	roads, haul roads), rip with construction equipment to a depth of at least 1 m, and over-rip with agricultural equipment in order to create suitable conditions for vegetation establishment; spread stockpiled topsoil; and ameliorate soils as required. • Allow for natural establishment of a viable self-sustaining vegetation community, in keeping with the surrounding natural environment, or establish pioneer vegetation species as per findings of dedicated rehabilitation trials to be run from the start of the project; and • Undertake vegetation monitoring (including % recovery of un-revegetated sites) post closure to ensure rehabilitation success	
Contaminated Soils	-Undertake a site-wide contaminated soil to determine the nature and extent of contamination, the sources of contamination and to identify appropriate remediation measures; -Rehabilitate moderately contaminated (inorganically contaminated) soils as follows: • Excavate contaminated material to a depth of 300 mm and remove and dispose of at the Kupferberg Landfill. - Rehabilitate moderately contaminated (organically contaminated) soils as follows: • Treat organic contamination by means of biological remediation via the establishment of a bioremediation site and monitor soil quality against a selected control site.	-Inorganically contaminated soils are safely disposed off at the Kupferberg Landfill, subject to granting of relevant permits -Organically contaminated soils are effectively treated and compositions are restored to acceptable levels once compared with control sites
Surface Infrastructure	**Infrastructure for Potential Beneficial re-use** • Compile an inventory of infrastructure and equipment to	-Formal transfer of ownership and liability of specific infrastructure

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
and Equipment	potentially remain at closure, aligning to end land use plan; • Obtain legal authorisations from City of Windhoek and Farm owner for infrastructure to remain and to be transferred; and • Finalise agreements with third parties, along with transfer schedule **<u>Surface infrastructure to be removed</u>** • Remove all assets/equipment that can be profitably removed for salvage or resale; • Dismantle/demolish infrastructure; • Decontaminate hazardous waste storage tanks and containers at a dedicated decontamination bay in Windhoek; • Demolish and excavate concrete foundations to 1 m below ground level. Alternatively and in appropriate instances the concrete slabs of "clean" infrastructure (not processing infrastructure) can be covered with a 1 000 mm soil cover as part of site re-profiling and integrated into the surrounding topography; • Backfill excavations of disturbed infrastructure footprint areas through a cut to fill action; • Shape and profile the disturbed surface areas to match surrounding topography and to ensure free drainage, thus limiting run-off erosion; • Stabilise disturbed areas to prevent erosion and sediment mobilisation in the short to medium term until a suitable vegetation cover has been established; • Rip disturbed footprint to a depth of approximately 500 mm with suitable agricultural equipment to alleviate compaction; and • Establish vegetation species that mimic the surrounding flora by	-Independent sign-off by a qualified engineer confirming the safe and stable condition of all transferred infrastructure -All other infrastructure decommissioned to ground level and removed from site

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	collecting seed from pristine bush and shrub land and actively planting before the wet season **Measures relating to support Infrastructure** • Obtain legal authorisations for infrastructure to remain and to be transferred; • In addition Identify and donate equipment to affected farmer that can be reused and/or recycled • Dismantle the remaining overland pipelines and salvage as possible; • Seal open ends of buried pipelines and fully cover with nothing exposed **Measures relating to transport Infrastructure** • Agreements will be put in place between Eagle Focus and local communities as well as the relevant authorities for roads to remain post closure for beneficial use by farmers. -Roads that will no longer be used by local communities post closure will be rehabilitated as follows: • Re-establish natural drainage, including the removal of culverts and/or trenching; • Profile to be free draining and emulating the natural surface topography; • Rip access roads to a depth of approximately 300 mm with suitable agricultural equipment to alleviate compaction; and • Establish vegetation species that mimic the surrounding shrub/ bushland by collecting seeds from pristine surroundings and actively planting before the wet season	

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	Measures relating to Electrical Infrastructure • Remove generators offsite and demolish concrete bases; • Dispose of demolition waste at demolition waste site; • Clean up contaminated soils at the generator site, as required **Measures relating to crusher plant and Mobile Machinery/ Vehicles** Conveyors • Dismantle steel structures and demolish concrete footings; and • Dispose demolition waste at demolition waste site Crusher Plants • Dismantle/demolish crushing plant; • Decontaminate crushing plant equipment at dedicated decontamination bay in Windhoek; • Demolish and excavate concrete foundations to 1 m below ground level. Alternatively and in appropriate instances the concrete slabs of "clean" infrastructure can be covered with a 1 000 mm soil cover as part of site re-profiling and integrated into the surrounding topography; • Clean up contaminated soils; and • Undertake general surface rehabilitation Machinery and Vehicles • Identify equipment that can be reused and/or recycled that will not be salvaged; • Remove remaining equipment offsite for sale or disposal at a registered waste site in Windhoek; and • Clean-up contaminated soils	

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
Above Ground Openings (quarry, diversion ditches)	• Place topsoil over the backfilled area; • Shape footprint area to be free-draining (aligned to site-wide routing); • Rip area to alleviate compaction; and • Establish vegetation	
Surface and Groundwater	Surface and groundwater monitoring must continue to be undertaken post closure to ensure that mining effluents meet the regulatory requirements. The following actions are to be undertaken: <u>For Surface Water</u> • Monthly monitoring of surface water sites for quality – for at least 5 years post closure or until site relinquishment criteria have been achieved; and • Conduct biomonitoring at selected downstream sites for at least 5 years or until site relinquishment criteria have been achieved. <u>For Groundwater</u> • Quarterly monitoring of boreholes (water quality and level) – for at least 5 years post-closure or until site relinquishment criteria have been achieved	-Water samples taken from sampling points downstream of the mine are within the National effluent quality specifications for a 12 month period - Water samples taken from representative groundwater monitoring boreholes are within the National effluent quality guidelines for a 12 month period
Petroleum Products	• Remove oil drums and petroleum products off site for re-sale/use; • Demolish the storage area and associated tanks in which petroleum products are stored; • Decontaminate at dedicated decontamination bay in Windhoek; • Demolish and excavate concrete foundations to 1 m below ground level; and	

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	• Clean up contaminated waste	
Solid Waste	• Sort and screen waste produced from the dismantling and demolition of infrastructure; • Crush decontaminated concrete, if required, to reduce uptake in waste cells; • Recycle waste that can be recycled/salvaged (e.g. steel) after decontamination; and • Dispose of inert demolition waste at the Kupferberg landfill	

4.4 A Quick Guide on Monitoring of EMP Implementation

To support and ensure that the proposed mitigation measures are achieving the desired results throughout the project's life cycle, a monitoring plan must be implemented alongside the mitigation plan. The environmental monitoring programme will also ensure compliance to the recommended mitigation measures and best practice environmental standards. Collectively, the environmental monitoring plan/ programme will serve the following purposes:

- To establish a baseline, that is, gathering information on the basic site characteristics to establish current conditions;
- To establish long term trends in disturbed systems;
- To estimate inherent variation within the environment, which can be compared with the variation observed in another specific area;
- To make comparisons against a standard or target level.

The following monitoring tools/ techniques are recommended:

- **PHOTOGRAPHS** must be used to provide evidence and verify compliance with respect to the following aspects:
    - Provision for quarry slope stabilization methods, e.g. benching, rock nails or bolts, meshing, etc.;
    - Provision for erosion control facilities onsite, e.g. silt traps, re-vegetation works on exposed areas;
    - Provision for dust and noise suppression facilities, e.g. planting of trees around the crusher plant, condition of access roads;
    - Stockpile areas for overburden and topsoil, highlighting zones with any evidence of erosion or those requiring protection from erosion;
    - Provision of wet suppression system provided at the crusher plant or other dust encapsulation system;
    - Provision of site signboards that are erected to indicate date and time of blasting operations;
    - Changes to the landscape of the area;
    - Proper waste management practice onsite, e.g. provision for waste collection bins, general site conditions at the working areas, site office, storage area, workshop, sewage facilities, and others;
    - Proper transportation management including utilisation of approved routes, allowable vehicles load and other;
    - Evidence for creation of new tracks due to non-compliance

Additionally, when photographs are submitted for compliance monitoring, they should be geo-referenced or their exact location should be clearly marked on a map together with GPS coordintes, as well as the date and time they were taken.

- **PERIODIC FIELD CHECKS** must be done during site preparation and operation stage of the stone quarry activities in order to ensure compliance with the following mitigation measures:
    - Conditions of quarry slopes;
    - Validity of all operating permits such as the ECC, water abstraction permit, blasting permits, etc;
    - Improved working practices/ management procedures at all work sites;
    - Phased quarrying and rehabilitation progress;
    - Acceptable conditions of man-made structures such as slope protection, drainage diversion and collection systems, ablution facilities, and oil storage facility;
    - Landscaping works post progressive rehabilitation of quarry;
    - Compliance to provision of appropriate and adequate PPE;
    - Compliance to recommended safe practice such as holding daily safety meetings and conducting daily inspections on vehicles and plant;
    - Compliance to reporting of all safety, health and environmental incidences through inspection of safety books;
    - Proper waste handling at all working areas;
    - Proper transportation management;
    - Visual inspection for general cleanliness and good management practices within the site;
    - Effectiveness of dust and noise suppression systems
- **RECORDS** of stone quarry activities to ensure compliance with the following mitigation measures:
    - Record of all blasting notices to surrounding farmers, residents and the Hosea Kutako airport's safety division;
    - Record of all safety, health and environmental incidences;
    - Blasting operation details to ensure that the blasting design and execution plans are strictly being followed;
    - Maintenance of erosion control facilities, e.g. drainage diversion and containment systems, gabions along steep access/ haul road shoulders;
    - Daily working hours;
    - Daily inspection logs for all vehicles and plant;
    - Records of any chance finds in so far as archaeological sites are concerned;

  - Records of any complains launched to Eagle Focus Investments concerning the quarry activities;
  - Whether data records being collected for monitoring purposes are actually being utilized by the proponent to assess trends and continuously improve on the recommended impact management and mitigation measures;
- **MAPS/ LAYOUT PLANS** to indicate locations of key structures and all monitoring tools or instruments being utilized during the operational phase. Such layout plans should encompass the following:
  - Boundary fence (if any) of the quarry and crusher areas;
  - Quarry boundary, slopes and any hazardous geological structures based on regular simple drone surveys and field inspections;
  - Haul and access roads;
  - Waste rock dumps;
  - Drainage collection and diversion channels;
  - Erosion control structures;
  - As-built outline of the crusher site including all stockpile bays;
  - As-built outline of all other infrastructures on site such as the mobile container office, workshop, weigh bridge, traffic sign boards;
  - As-built positions for all water and air quality monitoring stations;

5 RECOMMENDATIONS AND CONCLUSIONS

It is recommended that an Environmental Clearance Certificate be issued for the proposed quartzite quarrying and crushing activities on mining claim 72245, subject to the following recommendations:

- All required permits, licenses and approvals for the proposed activities are obtained as required. These include permits and licenses for land/farm access; water abstraction; blasting; removal of protected plant species; and all other necessary documentation for ensuring compliance with the specific legal requirements provided in this document.
- The management actions, monitoring plans and rehabilitation measures in this EMP are implemented and monitoring conducted as provided in **Table 4-2** and **Table 4-3** as well as the implementation of Archaeological Resources management measures indicated in **Appendix 1**.
- The Proponent complies with the legal requirements governing this type of project and its associated activities.

- All the necessary environmental and social (occupational health and safety) precautions provided shall be adhered to.
- The project' SHE Officer (or Environmental Coordinator) should effectively conduct EMP Compliance Monitoring. An Environmental Audit/Compliance Report shall be compiled for every monitoring and submitted to the DEAF at the Ministry of Environment, Forestry and Tourism for archiving. This would make the next ECC Renewal easier because of an in-between track record of monitoring progress prior to the expiry date of the valid ECC.
- An ECC Renewal application should be submitted at least 3 months before the expiry date of the valid ECC to allow time for the evaluation of the ECC Renewal report by the DEAF.

In conclusion, the effective implementation of the recommended management and monitoring actions (mitigation measures) will see the significant reduction in impacts' significance (that cannot be avoided) to acceptable degrees. It is therefore firmly recommended that the Proponent and their contractors/employees effectively implement the recommended management actions (mitigation measures). Furthermore, to maintain low significance, the implementation of measures will need to be continuously monitored by the Proponent (or the SHE Officer). Monitoring will not only be carried out to maintain a low rating of impacts' significance but to also ensure that all potential impacts identified in this study and other impacts that might arise during project implementation are properly identified in time and addressed.

APPENDIX 1: CHANCE FINDS PROCEDURE (AFTER KINAHAN, 2020)

Areas of proposed development activity are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The "*chance finds*" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): "*a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council*". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Responsibility:

Operator:	To exercise due caution if archaeological remains are found
Foreman:	To secure site and advise management timeously
Superintendent	To determine safe working boundary and request inspection
Archaeologist	To inspect, identify, advise management, and recover remains

Procedure:

<u>Action by person identifying archaeological or heritage material</u>

a) If operating machinery or equipment stop work

b) Identify the site with flag tape

c) Determine GPS position if possible

d) Report findings to foreman

<u>Action by foreman</u>

a) Report findings, site location and actions taken to superintendent

b) Cease any works in immediate vicinity

Action by superintendent

a) Visit site and determine whether work can proceed without damage to findings

b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by archaeologist

Action by Archaeologist

a) Inspect site and confirm addition to project GIS

b) Advise NHC and request written permission to remove findings from work area

c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

a) Actions as above

b) Field inspection by archaeologist to confirm that remains are human

c) Advise and liaise with NHC and Police

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.