ENVIROLEAP CONSULTING CC

P. O. Box 25874, Windhoek
Email: info@enviroleap.com | Cell: +264 81 232 6843 | EFax: +264 88 655

ENVIRONMENTAL MANAGEMENT PLAN SMALL-SCALE DIMENSION STONE QUARRYING ON QUARRYING ON MINING CLAIM NO. 70785 ON FARM ETUSIS – NO. 75, KARIBIB DISTRICT, ERONGO REGION.

Prepared For

Mr. Jessy J. K. Nombanza
P. O. Box 25819
ERF 1038, St. Helen Road
Windhoek, Namibia

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Project Manager	Vilho Mtuleni
Author	Vilho Mtuleni
Reviewer	TGi-Enviro Leap Consulting cc
Client	Mr. Jessy J. K. Nombanza
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1 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.1 OVERALL OBJECTIVES OF THE EMP

The following overall environmental objectives have been set for the IPMMs and Partners small-scale quarrying project:

- To comply with national legislation and standards for the protection of the environment.
- To limit potential impacts on biodiversity through the minimisation of the footprint (as far as practically possible) and the conservation of residual habitat within the mine area.
- To keep surrounding communities informed of farming activities through the implementation of forums for communication and constructive dialogue.
- To ensure the legal and appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, recycling, management, temporary storage and removal of waste.
- To develop, implement and manage monitoring systems to ensure good environmental performance in respect of the following: ground and surface water, air quality, noise and vibration, biodiversity and rehabilitation.

1.2 METHODS OF IMPACT SCOPING / ASSESSMENT

As part of the Scoping and EMP processes for the marble quarry, environmental aspects and potential environmental impacts associated with the activities and facilities were identified. Detailed mining claim's activities associated with the operation shall be described in section of this EMP. Table 4 provides a description of the environmental aspects that are associated with the marble quarry operations and how they impact the biophysical and human environments, respectively.

Both the criteria used to assess the impacts and the method of determining the significance of the impacts is outlined in **Table** 5. This method complies with the method provided in the Namibian EIA Policy document and the draft EIA regulations. Part A provides the approach for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D. Both mitigated and unmitigated scenarios are considered for each impact.

Table 1: Criteria for Assessing Impacts

PART A: DEFINITION AND CRITERIA		
Definition of SIGNIFICANCE		**Significance = consequence x probability**
Definition of CONSEQUENCE		**Consequence is a function of severity, spatial extent and duration**
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	**H**	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favorable publicity.
Criteria for ranking the DURATION of impacts	**L**	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of Impacts	**L**	Localized - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

PART B: DETERMINING CONSEQUENCE					
		SEVERITY = L			
DURATION	Long term	H	Medium	Medium	Medium
	Medium term	M	Low	Low	Medium
	Short term	L	Low	Low	Medium
		SEVERITY = M			
DURATION	Long term	H	Medium	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Low	Medium	Medium
		SEVERITY = H			
DURATION	Long term	H	High	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Medium	Medium	High
			L	M	H
			Localized Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
			SPATIAL SCALE		

PART C: DETERMINING SIGNIFICANCE					
PROBABILITY (of exposure to impacts)	Definite/ Continuous	H	Medium	Medium	High
	Possible/ frequent	M	Medium	Medium	High
	Unlikely/ seldom	L	Low	Low	Medium
			L	M	H
			CONSEQUENCE		

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	**Decision guideline**
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

***H = high, M= medium and L= low and + denotes a positive impact.**

1.3 STAKEHOLDER MANAGEMENT AND MITIGATION

It is important that channels of communication are maintained over the life of the project for surrounding landowners, the general public members, as well as the local and traditional authorities, table 4 shows the stakeholders communication Management and Mitigation Plan.

Table 2: Actions relating to stakeholder communication

Issue	Management commitment	Phase
Understanding who the stakeholders are	Maintain and update the claim holders stakeholder register, including stakeholders' needs and expectations. Ensure that all relevant stakeholder groups are included.	**All**
	A representative database would include government, employees, service providers, contractors, indigenous populations, local communities, traditional authorities, NGOs, shareholders, customers, the investment sector, community-based organizations, suppliers and the media.	**All**
	Ensure that marginalized and vulnerable groups are also considered in the stakeholder communication process.	**All**
	Record partnerships as well as their roles, responsibilities, capacity and contribution to development.	**All**
Liaising with interested and affected parties at all phases in the mine life	Devise and implement a stakeholder communication and engagement strategy.	**All**
Responsibility		

1.4 IMPACT SCOPING / ASSESSMENT
1.4.1 HAZARDOUS AND WASTE GENERATION / DISPOSAL

1.4.1.1 ASSESSMENT OF IMPACT: HAZARDOUS (FUEL & LUBRICANTS) WASTE DISPOSAL

The potential impact from fuel and lubricants resulting from the servicing of machineries and storage of fuels on the project site could present a risk to the underground water sources. This could potentially occur through the contamination of soil with hydrocarbons and if management of such is poor.

However, the project location is situated in a flat terrain with no natural watercourse such as streams, channels and rivers and thus contamination of soils is highly localised due to no or little surface runoff during rain events.

Tabulated Summary of Assessed Impact – spillage and disposal of hazardous waste

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	L	M	L	M
Mitigated	L	L	L	L	L	M

CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Storage of fuel (diesel) on site should be done in a raised storage facility contained in a concrete wall and floor to reduce possible spillage of diesel and drainage into the ground. Any machinery servicing must as well not conducted on the project unless in an emergency situation, in which case all fuel and lubricants should be collected and disposed off at an authorised waste disposal site I the nearby town e.g. Okahandja or Windhoek.

1.4.1.2 ASSESSMENT OF IMPACT: DOMESTIC SOLID AND EFFLUENT DISPOSAL

The disposal of domestic waste from the staff lodging facility may, if not properly managed contribute to littering of the surrounding environment. It may further lead to pollution of the aesthetic value of the wilderness and negatively impact the tourism potential of the area. Hence, disposal of domestic waste should not be permitted on site unless temporarily stored onsite and transported to registered disposal sites.

Tabulated summary of the assessed impact – pollution of environment with domestic litter

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	M	L	M	M	M
Mitigated	L	L	L	L	L	L

CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Reduce waste production as much as possible by recycling waste material that can be recycled. Classify waste and transport those which cannot be reused / recycled material to a suitable disposal facility. Scavengers must not be able to enter the temporary waste storage facility the waste may be hazardous and present a health hazard / risk to both human and wildlife such as baboons etc.

1.4.1.3 ASSESSMENT OF IMPACT: CONTAMINATION OF SOILS AND UNDERGROUND WATER

The potential impact from fuel and lubricants resulting from the servicing of machineries and storage of fuels on the project site could present a risk to the underground water sources. This could potentially occur through the contamination of soil with hydrocarbons and if management of such is poor.

However, the project location is situated in a flat terrain with no natural watercourse such as streams, channels and rivers and thus contamination of soils is highly localised due to no or little surface runoff during rain events.

Tabulated summary of the assessed impact – contamination of soil and underground water

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	M	L	M	M	M
Mitigated	L	L	L	L	L	M

CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Storage of fuel (diesel) on site should be done in a raised storage facility contained in a concrete wall and floor to reduce possible spillage of diesel and drainage into the ground. Any machinery servicing must as well not conducted on the project unless in an emergency situation, in which case all fuel and lubricants should be collected and disposed off at an authorised waste disposal site I the nearby town e.g. Okahandja or Windhoek.

1.4.2 AIR AND NOISE POLLUTION

1.4.2.1 ASSESSMENT OF IMPACT: AIR POLLUTION

Dust from quarrying activities is typically caused by blasting and haulage activities. While they are minimal and thus seldom harmful to human health, they may be offensive and result in a nuisance impact and in some cases impact on the vegetation by covering the transpiration spores on the plant leaves.

However, because the quarrying scale is small, the potential impacts are expected to be generally low. In addition, the prevailing winds will disperse Dust away from any sensitive receptors (see **Fig 4**) which in addition to mitigation measure reduces the health risk associated with Dust.

Critically, the nuisance impact of potentially offensive Dust cannot be discounted if the normal operation regime is upset and quarrying is not conducted in the desired manner, or should Dust control mechanisms are not employed appropriately. In this case, the impact may be significant.

Tabulated Summary of the Assessed Impact – Release of Dust into the Atmosphere

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	H	L	M	H	M
Mitigated	L	M	L	L	M	L

CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Dust is subjective and dependent on difference in public perception, therefore there is no dedicated Dust-monitoring programme developed other than an incident register. Hence, a stakeholder committee should be established to log and attend to Dust complaints. Importantly, the record of complaints should include the date and time so that it may be associated with the Dust generating activity. This will aid the identification of the Dust source (or activity) and required management intervention devised to eliminate the activity as a future source.

1.4.2.2 ASSESSMENT OF IMPACT: NOISE POLLUTION

Potential noise generation impacts identified could be associated primarily to the use of explosive during blasting and secondarily to machineries used throughout the quarrying process and lifespan of the project. However, given the small scale of operation by claims holder, blasting activities are limited to two every six-month, while the secondary noise generating activity is considered to only be a concern on windy days. Additionally, the location of the quarrying site is well placed that the only nearest receptor is about 5 km away from the project site, therefore noise may only impact on wildlife that may wonder in close proximity to the site.

With blasting activity occurring only four time a year, in which case prior notifications to any nearby receptors should be given on the exact date and time at which blasting shall be conducted.

The significance of impacts on air quality as a result of dust generation from the mining claims is expected to be none or very Low. As the direction of dispersion with the prevailing winds will be away from any sensitive receptors and the predicted concentrations are well below the interim target values, the impact of PM10 from the dust fallouts on vegetation is also expected to be low.

Tabulated Summary of the Assessed Impact – Generation of noise from operations (Machinery and Blasting)

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	L	L	L	L	L	L
Mitigated	L	L	L	L	L	L

CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Noise is subjective and dependent on difference in public perception, therefore there is no dedicated noise-monitoring programme developed other than an incident register. Hence, in addition to Dust monitoring the

stakeholder committee should be tasked to log and attend to noise complaints as well. Therefore, the record of complaints should also include the date and time so that it may be associated with the noise generating activity. This will aid the identification of the noise source (or activity) and required management intervention devised to eliminate the activity as a future source.

1.4.3 SOCIO-ECONOMIC ASPECTS

1.4.3.1 ASSESSMENT OF IMPACT: SOCIAL INTRUSION

The activities associated with the mining claims have socio-economic impacts in all phases – some positive and some negative. These impacts related to amongst others employment/job creation, local and regional economies, land use and surrounding landowners and community safety and security. During the operation phase mining claim holders may at a minimal provide seasonal job opportunities to the local community.

Tabulated Summary of the Assessed Impact – Socio-Economic Impacts

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H+	L	L	L	L	L
Mitigated	H+	M	M	H+	M	H

CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Preparation of a health and safety plan for workers and impacted communities addressing issues including education on measures to prevent the spread of HIV/AIDS through awareness campaigns, provision of safety equipment for workers, child labor prohibited

1.5 CONCLUSIONS AND RECOMMENDATIONS

Potential impacts (Socio-economic, Generation of Effluent and Waste, and Ambient Air Pollution) were identified as a key environmental issue through the scoping process. Dust, which are a nuisance rather than a classic air pollutant, may emanate from different areas of the plant including the animal preparation area, from meat processing, skin and blubber splitting, skin cleaning and organ processing and from the storage of animal. Effluent and Waste (Solid and Bio Waste) are the other key environmental issue identified.

Nonetheless, all identified impacts are considered to be localized, short-medium term and minor due to the nature of the seal industry, where impacts are limited to few months of the year. These months present and advantage that winds are strong during these periods, aiding the control of Dust, while the mitigation measured proposed allows for the pre-treatment of the effluent to standards that it can than be used for gardening and not discharged into the municipal sewerage system.

It is thus recommended that the Office of Environmental Commissioner issues and Environmental Clearance on condition that all proposed measures will be implemented and adhered to. Further, the proponent shall commission for a formal design of an effluent treatment facility with the capacity to treat the total daily effluent from the factory.

The additional capacity for storage of recycled water is necessary to allow the proponent to store water in case of access output of pre-treated water from the treatment facility.

2. ENVIRONMENTAL MANAGEMENT PLAN for MR. JESSY J. K. NOMBANZA

2.1 OVERALL OBJECTIVES OF THE EMP

The following overall environmental objectives have been set for the Mr. Jessy J. K. Nombanza mining claims:

- To comply with national legislation and standards for the protection of the environment.
- To limit potential impacts on biodiversity through the minimisation of the footprint (as far as practically possible) and the conservation of residual habitat within the mine area.
- To keep surrounding communities informed of farming activities through the implementation of forums for communication and constructive dialogue.
- To ensure the legal and appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, recycling, management, temporary storage and removal of waste.
- To develop, implement and manage monitoring systems to ensure good environmental performance in respect of the following: ground and surface water, air quality, noise and vibration, biodiversity and rehabilitation.

The Management and Mitigation Plans (MMPs), listed in the table below, are applicable to all the relevant activities and facilities of Mr Nombanza quarrying activities. (The MMPs follow in the subsequent sections).

2.2 STAKEHOLDER MANAGEMENT AND MITIGATION

It is important that channels of communication are maintained over the life of the project for surrounding landowners, the general public members, as well as the local and traditional authorities, table 4 shows the stakeholders communication Management and Mitigation Plan.

Table 3: Actions relating to stakeholder communication

Issue	Management commitment	Phase
Understanding who the stakeholders are	Maintain and update the stakeholder register, including stakeholders' needs and expectations. Ensure that all relevant stakeholder groups are included.	**All**
	A representative database would include government, employees, service providers, contractors, indigenous populations, local communities, traditional authorities, NGOs, shareholders, customers, the investment sector, community-based organizations, suppliers and the media.	**All**
	Ensure that marginalized and vulnerable groups are also considered in the stakeholder communication process.	**All**
	Record partnerships as well as their roles, responsibilities, capacity and contribution to development.	**All**
Liaising with interested and affected parties at all phases in the mine life	Devise and implement a stakeholder communication and engagement strategy.	**All**
Responsibility		

2.3 TOPOGRAPHY MANAGEMENT AND MITIGATION

2.3.1 ISSUE: SECURITY AND SAFETY IMPACT

Impacts relating to the welfare, health and safety of the local communities may arise as a result of traffic, noise, air quality, pollution issues, etc. During the construction phase Mr. Nombanza may at a minimal provide job opportunities to the local community.

Hazardous excavations and infrastructure include all structures into or off which third parties and animals can collide, fall and be harmed. In the construction and decommissioning phases these hazardous excavations and infrastructure are usually temporary in nature, usually existing for a few weeks to a few months. The operational phase will present more long-term hazardous infrastructure. It is essential that safety and security measures are defined and implemented to adequately protect the mine site from being accessed by unauthorized people.

Table 4: Hazardous excavations & infrastructure - link to phase & activities

Issue	Management commitment	Phase
Hazardous excavations	All staff will be trained to attend to third parties and animals so as to avoid situations where people and animals can enter safety risk areas.	All
Safety and Security Risks	At closure, permanent warning signs will be in place at appropriate intervals, in appropriate languages with danger pictures to warn people of any potential dangerous farm areas / equipment	All
Access to the site by unauthorized persons to the Operation site	Any person entering the mining / exploration and other operation areas (fields and packaging) will only be allowed after formal approval.	All
Emergency	Develop and implement an emergency response plan for third parties falling into or off hazardous excavations and causing injury.	Operational
Responsibility		

2.4 BIODIVERSITY MANAGEMENT AND MITIGATION

2.4.1 ISSUE: GENERAL PHYSICAL DISTURBANCE OF BIODIVERSITY

The section is a high level assessment of biodiversity impacts in line with the content of the baseline description (Section 4), and the content of this EMP. The assessment covers the following broad topics: physical destruction of biodiversity and related functions, impacts on surface water resources as an ecological driver, and general disturbances to biodiversity.

Table 5: Physical desruption of biodiversity - link to phase and activities

Issue	Management commitment	Phase
Physical disruption to biodiversity by Staff	The Principle of zero tolerance to killing and collecting of biodiversity i.e. no poaching (including collection firewood) will be allowed and poaching offenders will be prosecuted.	All
	All species with a conservation and or protection status should be identified, clearly marked and preserved (by at least 50%)	Construction
Physical disruption to biodiversity by infrastructures	Erect a game-proof fence around the pit and quarrying operations to ensure that animals have no access to operation areas, which may be contaminated by mining chemicals.	All
	Upon completing construction, initiate restoration of all infrastructure including roads areas that were only impacted during construction and will not be required for farming operation	Operation, decommissioning and closure
Emergency	Certain instances of injury to animals may be considered emergency situations. These will be managed in accordance with the Mr. Nombanza's emergency response procedure.	All
Responsibility		

2.5 WATER RESOURCES MANAGEMENT AND MITIGATION

2.5.1 ISSUE: ALTERING AND POLLUTION OF SURFACE AND GROUNDWATER

The altering and obstructing of surface water drainage (change in water flow and gully erosion of the river beds from channeling of water) is identified as a potential impact associated with the proposed activities, as well as water pollution i.e. through the change to surface water and nutrient flow.

There are a number of pollution sources in all project phases that have the potential to pollute surface and groundwater, particularly in the unmitigated scenario. In the construction and decommissioning phases these potential pollution sources are temporary in nature, usually existing for a few weeks to a few months. Although these sources may be temporary, the potential pollution may be long term. The operational phase will present more long-term potential sources.

Table 6: Altering surface drainage patterns –link to operation phases and activities

Issue	Management commitment	Phase
Blocking or deviation of water flow	Minimize infrastructure footprint and construction footprint	Operation
	Avoid placing any infrastructure or waste material across drainage lines. Where unavoidable ensure uninterrupted drainage by constructing bypass channels.	Operation
Loss of surface water, and change of drainage patterns	Do not place service infrastructure in ecologically sensitive areas, or in areas identified as corridors of animal movement.	Operation
Natural flow of storm water (clean and dirty)	Design all storm water interventions in such a way that storm water can bypass the major structures.	Operation
	Ensure that these facilitates are designed, constructed and operated that flood protection is provided.	Operation
Responsibility		

2.6 AIR AND NOISE MANAGEMENT AND MITIGATION
2.6.1 ISSUE: AIR AND NOISE POLLUTION

Quarrying / quarrying, processing and transportation equipment (soil tillage) on site is likely to create very little dust and noise that may contribute although little to air and noise pollution. This may be an unwanted change to the community of the area.

Table 7: Air pollution – link to phase and activities

Issue	Management commitment	Phase
Air pollution impact to Biodiversity and nearby Human community	All design mitigation measures to be implemented (including water sprays on all roads and temporary unpaved farm roads, waters sprays at highly polluting areas (activity sites)	All
	All diesel powered equipment and plant vehicles should be kept at a high level of maintenance. Any change in the noise emission characteristics of equipment should serve as trigger for withdrawing it for maintenance.	All
Impact of noise on the environment/ sensitive receptors	Document and investigate all registered complaints and make efforts to address the area of concern where possible. A mechanism to monitor noise levels, record and respond complaints and mitigate impacts should be developed.	All
Responsibility		

2.7 SOCIO-ECONOMIC MANAGEMENT AND MITIGATION
2.7.1 ISSUE: ECONOMIC IMPACTS ON LOCAL NON-FARMING LIVELIHOODS

The activities associated with Mr. Nombanza marble quarrying have socio-economic impacts in all phases – some positive and some negative. These impacts related to amongst others employment/job creation, local and regional economies, land use and surrounding landowners and community safety and security. During the construction phase Mr. Nombanza may at a minimal provide job opportunities to the local community. This EMP aims to provide measures to enhance the positive impacts and limit the negatives impacts.

Table 8: Health and safety – link to phase and activities/infrastructure

Issue	Management commitment	Phase
Impacts on livelihood resettlement	Engage with the affected communities through a process of informed consultation and participation to reach consensus on any activities that affect them.	A All
	Provide affected people with necessary transitional support (such as short-term employment, subsistence support, or salary maintenance).	Construction
Impacts on HIV / AIDS	Preparation of a health and safety plan for workers and impacted communities addressing issues including education on measures to prevent the spread of HIV/AIDS through awareness campaigns, provision of safety equipment for workers, child labor prohibited	
Responsibility		