Omusati Granite (Pty) Ltd

Updated Environmental Management Plan (EMP) Report to Support the Application for the Renewal of the Environmental Clearance Certificate (ECC) for Mining License (ML) No. 167

KARIBIB DISTRICT, ERONGO REGION

September 2021

Omusati Granite (Pty) Ltd
P. O. Box 90979,
Klein Windhoek,
WINDHOEK, NAMIBIA

PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

MINISTRY OF ENVIRONMENT, TOURISM AND FORESTRY (MEFT),
ENVIRONMENT CLEARANCE CERTIFICATE (ECC)
APPLICATION REFERENCE No.
APP-003005

TYPE OF AUTHORISATIONS REQUIRING ECC
Mining License (ML) No. 167

NAME OF THE PROPONENT
Omusati Granite (Pty) Ltd

COMPETENT AUTHORITY
Ministry of Mines and Energy (MME)

ADDRESS OF THE PROPONENT AND CONTACT PERSON
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Klein Windhoek,
WINDHOEK, NAMIBIA

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PROPOSED PROJECT
Ongoing Dimension Stone (Marble) Mining Operation in
Mining License (ML) No. 167

PROJECT LOCATION
Karibib District Erongo Region
(Latitude: -22.107975, Longitude: 15.799915)

ENVIRONMENTAL CONSULTANTS
Risk-Based Solutions (RBS) CC
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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)
Dr. Sindila Mwiya

Summary Profile and Qualifications of the Environmental Assessment Practitioner (EAP) / International Resources Consultant – Dr Sindila Mwiya

Dr Sindila Mwiya has more than eighteen (18) years of practical field-based technical industry experience in Environmental Assessment (SEA, EIA, EMP, EMS), Energy (Renewable and Non-renewable energy sources), onshore and offshore resources (minerals, oil, gas and water) exploration / prospecting, operation and utilisation, covering general and specialist technical exploration and recovery support, Health, Safety and Environment (HSE) permitting for Geophysical Surveys such as 2D, 3D and 4D Seismic, Gravity and Electromagnetic Surveys for mining, energy and petroleum (oil and gas) operations support, through to engineering planning, layout, designing, logistical support, recovery, production / operations, compliance monitoring, rehabilitation, closure and aftercare projects lifecycles. He continues to work internationally in the resources (mining and petroleum) and energy sectors, from permitting through to exploration and production. From the frontier regions (high risk hydrocarbons exploration zones) of South Africa and Namibia, to the prolific oil and gas fields of the Middle East, Angola and the West African Gulf of Guinea, Dr Mwiya has been directly involved in field-based aerial, ground and marine geophysical (gravity, magnetics and seismic) surveys, been onboard exploration drilling rigs, onboard production platforms, conducted public and stakeholder consultations and engagements, and worked with highly technical and well organised and committed clients and third-party teams from emerging and well established global resources and energy companies from many countries such as the UK, France, USA, Russia, Canada, Croatia, Norway, the Netherland, Spain, Brazil, China, South Africa, Equatorial Guinea, Angola and Nigeria. He is fully aware of all the competing interests and niche donation-based business environmental advocacy opportunism that exists in the resources sector from the local, regional, and international perspectives.

Through his companies, Risk-Based Solutions (RBS) CC and Foresight Group Namibia (FGN) (Pty) Ltd which he founded, he has undertaken more than 200 projects for Local (Namibia), Continental (Africa) and International (Global) based clients. He has worked and continue to work for Global, Continental and Namibian based reputable resources (petroleum and mining / minerals) and energy companies such as Dundee Precious Metals (Namibia / Canada), Headspring Investment (Namibia/ Russia), Green Energy (Namibia/UK/Russia), EMGS (UK/ Norway), Lepidico (Australia / UK), Best Sheer / Bohale (Namibia / China), CGG Services UK Limited (UK/ France/Namibia), BW Offshore (Norway/Singapore /Namibia), Shell Namibia B. V. Limited (Namibia/ the Netherlands), Tullow Oil (UK/Namibia), Debmarine (DBMN) (Namibia), Reconnaissance Energy Africa Ltd (ReconAfrica) (UK/Canada/Namibia), Osino Resource Corporation (Canada/USA/Namibia), Petrobras Oil and Gas (Brazil) / BP (UK)/ Namibia, REPSOL (Spain/ Namibia), ACREP (Namibia/Angola), Preview Energy Resources (UK), HRT Africa (Brazil / USA/ Namibia), Chariot Oil and Gas Exploration (UK/ Namibia), NABIRM (USA/ Namibia), Serica Energy (UK/ Namibia), Eco (Atlantic) Oil and Gas (Canada / USA/ Namibia), ION GeoVentures (USA), PGS UK Exploration (UK), TGS-Nopec (UK), Maurel & Prom (France/ Namibia), GeoPartners (UK), PetroSA Equatorial Guinea (South Africa / Equatorial Guinea/ Namibia), Preview Energy Resources (Namibia / UK), Sintezneftegaz Namibia Ltd (Russia/ Namibia), INA Namibia (INA INDUSTRIJA NAFTE d.d) (Croatia/ Namibia), Namibia Underwater Technologies (NUTAM) (South Africa/Namibia), InnoSun Holdings (Pty) Ltd and all its subsidiary renewable energy companies and projects in Namibia (Namibia / France), HopSol (Namibia/Switzerland), Momentous Solar One (Pty) Ltd (Namibia / Canada), OLC Northern Sun Energy (Pty) Ltd (Namibia) and more than 100 local companies. Dr Sindila Mwiya is highly qualified with extensive practical field-based experience in petroleum, mining, renewable energy (Solar, Wind, Biomass, Geothermal and Hydropower), Non-Renewable energy (Coal, Petroleum, and Natural Gas), applied environmental assessment, management, and monitoring (Scoping, EIA, EMP, EMP, EMS) and overall industry specific HSE, cleaner production programmes, Geoenvironmental, geological and geotechnical engineering specialist fields.

Dr Sindila Mwiya has undertaken and continue to undertake and manage high value projects on behalf of global and local resources and energy companies. Currently, (2020-2023) Dr Sindila Mwiya is responsible for permitting planning through to operational and completion compliance monitoring, HSE and engineering technical support for multiple major upstream onshore and offshore petroleum, minerals, and mining projects, Solar and Wind Energy Projects, manufacturing and environmentally sustainable, automated / smart and Climate Change resilient homes developments in different parts of the World including Namibia. He continue to worked as an International Resources Consultant, national Environmental Assessment Practitioner (EAP) / Environmentally Sustainable, automated / smart and Climate Change resilient homes developer, Engineering / Technical Consultant (RBS / FGN), Project Manager, Programme Advisor for the Department of Natural and Applied Sciences, Namibia University of Science and Technology (NUST) and has worked as a Lecturer, University of Namibia (UNAM), External Examiner/ Moderator, NUST, National (Namibia) Technical Advisor (Directorate of Environmental Affairs, Ministry of Environment, Forestry and Tourism / DANIDA – Cleaner Production Component) and Chief Geologist for Engineering and Environment Division, Geological Survey of Namibia, Ministry of Mines and Energy and a Field-Based Geotechnician (Specialised in Magnetics, Seismic, Gravity and Electromagnetics Exploration and Survey Methods) under the Federal Institute for Geoscience and Natural Resources (BGR) German Mineral Exploration Promotion Project to Namibia, Geophysics Division, Geological Survey of Namibia, Ministry of Mines and Energy.

He has supervised and continue to support a number of MScs and PhDs research programmes and has been a reviewer on international, national and regional researches, plans, programmes and projects with the objective to ensure substantial local skills development, pivotal to the national socioeconomic development through the promotion of sustainable natural resources coexistence, management, development, recovery, utilisation and for development policies, plans, programmes and projects financed by governments, private investors and Namibian development partners. Since 2006 until 2017, he has provided extensive technical support to the Department of Environmental Affairs (DEA), Ministry of Environment, Forestry and Tourism (MEFT) through GIZ in the preparation and amendments of the Namibian Environmental Management Act, 2007, (Act No. 7 of 2007), Strategic Environmental Assessment (SEA) Regulations, Environmental Impact Assessment (EIA) Regulations as well as the SEA and EIA Guidelines and Procedures all aimed at promoting effective environmental assessment and management practices in Namibia. Among his academic achievements, Dr Sindila Mwiya is a holder of a PhD within the broader fields of Engineering Geology/Geotechnical / Geoenvironmental / Environmental Engineering and Artificial Intelligence with a research thesis titled Development of a Knowledge-Based System Methodology (KBSM) for the Design of Solid Waste Disposal Sites in Arid and Semiarid Environments, MPhil/PG Cert and BEng (Hons) (Engineering Geology and Geotechnics) qualifications from the University of Portsmouth, School of Earth and Environmental Sciences, United Kingdom. During the 2004 Namibia National Science Awards, organised by the Namibian Ministry of Education, and held in Windhoek, Dr Sindila Mwiya was awarded the Geologist of the Year for 2004, in the professional category. Furthermore, as part of his professional career recognition, Dr Sindila Mwiya is a life member of the Geological Society of Namibia,

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EXECUTIVE SUMMARY

1. Introduction

Omusati Granite (Pty) Ltd (**the Proponent**) holds minerals rights under the Mining License (ML) No. 167. The ML 167 is situated in the Karibib District, Erongo Region and was granted on the 17/10/2020 and will expire on the 17/10/2030. The ML 167 covers a total area of 766 Ha. The ML 167 is situated in the Karibib District, Erongo. The total delineated marble reserve and resource currently stands at 25 million and 40 million cubic meters respectively with continuous ongoing exploration activities, this amount will increase to reserve of 80 million cubic meters.

This Environmental Management Plan (EMP) Report provides the detailed mitigation measures that the proponent shall implement with respect to the ongoing dimension stone (marble) mining operations as well as all the supporting infrastructures such as roads and water supply within the ML 167 and the transportation of the mine products for processing in Karibib or Walvis Bay. This updated EMP excludes all the activities associated with the processing of the mined marble once it arrives at the processing plant in Karibib or Walvis Bay.

2. The EMP Provisions

The Environmental Management Plan (EMP), described in this report, is based on the findings as detailed in the updated EIA. Omusati Granite (Pty) Ltd must incorporate the EMP in the Environmental Management System (EMS) of the company in line with the Environmental Policy of the company. This Updated EMP report incorporates the provisions of the Minerals (Prospecting and Mining) Act (No. 33 of 1992), Environmental Impact Assessment Regulations (2012) and the Environmental Management Act, 2007, (Act No. 7 of 2007) as well as all the key applicable legislative provisions as outlined in the EIA Report (Chapter 3) and summarised in Subsection 1.3.2 of this EMP Report.

3. Summary of the EMP

Based on the assessment of both negative and positive impacts undertaken for the ongoing marble mining operations, ongoing exploration activities and associated supporting infrastructures such as roads and water supply within the ML 167, several positive and negative impacts have been identified. Mitigation measures for the negative impacts have been proposed and management strategies are provided in this updated Environmental Management Plan (EMP) covering the following development stages:

(i) Preconstruction.

(ii) Construction.

(iii) Operation, ongoing exploration, monitoring and rehabilitation, and.

(iv) Decommissioning, closure, and aftercare.

Overall, it is hereby recommended that the ongoing marble mining operations, ongoing exploration activities and associated supporting infrastructures in the ML 167 be issued with an Environmental Clearance Certificate (ECC) with the following key conditions:

(i) The proponent shall prepare a detailed Updated EMP Report to address all the identified medium and high rated impacts.

(ii) The proponent shall negotiate a Lease Agreement with the land owner/s covered by the ML 167.

(iii) The proponent shall negotiate further Lease Agreements with the owners of any other farm falling within the ML 167 that may be used for mining related operations in the future as maybe required.

(iv) In consultation with the land owners and where possible and if key and core conservation, tourism or archaeological resources areas are identified within the ML 167 area, such areas shall be excluded from future mining activities.

(v) The proponent must implement and adhere to all the provisions of the Updated EMP report, and.

(vi) Environmental monitoring shall be implemented as provided for the in EMP and Environmental Clearance Certificate (ECC).

4. Proponent Roles and Responsibilities

The following are the recommended actions (roles and responsibility) to be implemented by the proponent (Omusati Granite (Pty) Ltd) as a part of the management of the impacts through implementations of this Updated EMP Report:

(i) Contract an Environmental Control Officer / External Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the ongoing mining operations.

(ii) Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle.

(iii) Develop a simplified environmental induction and awareness programme for all the workforce, contractors and sub-contractors.

(iv) Where contracted service providers are likely to cause environmental impacts, these will need to identified and contract agreements need to be developed with costing provisions for environmental liabilities.

(v) Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report to be prepared by the Environmental Control Officer / External Consultant / suitable in-house resource person and to be submitted to the regulators and to end the ongoing mining operations.

(vi) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA related to the expansion of the current delineated resources or development of completely new mine site within the EPL area.

All the responsibilities to ensure that the recommendations are executed accordingly, rest with the proponent **(Omusati Granite (Pty) Ltd).** The proponent must provide all appropriate resource requirements for the implementation of this Updated EMP as well as an independently managed (not directly controlled by the mining company) funding instrument for mine closure and aftercare environmental liabilities. It is the responsibility of the proponent to make sure that all members of the workforce including contractors and subcontractors are aware of this EMP provisions and its objectives.

It is hereby recommended that the proponent take all the necessary steps to implement all the recommendations of this EMP for the successful execution of the preconstruction, construction, operational, decommissioning, closure and aftercare activities of the ongoing marble mining operations, ongoing exploration activities and associated supporting infrastructures.

1. BACKGROUND

1.1 Introduction

Omusati Granite (Pty) Ltd (the Proponent) holds minerals rights under the Mining License (ML) No. 167. The ML 167 is situated in the Karibib District, Erongo Region and was granted on the 17/10/2020 and will expire on the 17/10/2030. The ML 167 covers a total area of 766 Ha.

1.2 Ongoing Project Summary

The following is the summary of the key components of the ongoing mining and exploration operations in the ML 167:

- **Commodity Groups**: Dimension stones and industrial minerals with special focus on marble mining.
- **Reserve and Resource**: 25 million and 40 million cubic meters respectively with continuous ongoing exploration activities, this amount will increase to reserve of 80 million cubic meters.
- **Type/s of Marble**: White and grey marble.
- **Estimated mine life**: 25 years and beyond.
- **Socioeconomic benefits** / **Project Motivation**: Employment opportunities, value addition, in-situ potential underground minerals resources and high beneficiation opportunities in Karibib / Walvis Bay and additional socioeconomic benefits in terms of capital investments, license rental fees, royalties payable to Government, export earnings, foreign direct investments, and various taxes payable to the Government.
- **Mining Technique:** Quarry, with a diamond wire saws and stone cutting machines used for cutting out the 5 m^3 rectangular blocks.
- **Processing**: Further processing of the mined-out marble blocks will take place either in Karibib or Walvis Bay. At the processing plant, a giant saw is used to cut up the marble into more manageable pieces.
- **Sources of Water Supply:** Groundwater from a local borehole to be drilled.
- **Sources of Electricity Supply**: Diesel generator and solar.
- **Mining and operational equipment**: 2 Loaders, 2 Excavators, 4 Generators, 4 Air Compressors, 8 Wire Saws, 8 Stone Cutting Machine, 16 Water Tanks, 6 Wendy Houses and 10 Containers, and.
- **Waste Rock**: Waste rock will be used for mine rehabilitation. The effective capacity of the waste rock facility will vary but is likely to be in range of 100 × 90 m^3, calculated with 0.85 as capacity utilization coefficient of waste rock.

1.3 Regulatory Requirements and Summary of the Regulatory Register

1.3.1 Regulatory Requirements

The ongoing mining and exploration / prospecting activities in the ML 167 falls under the activities that are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC). To obtain the ECC for the ongoing mining and exploration activities, the proponent is required to have undertaken Environmental Assessment comprising Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports.

In fulfilment of the environmental requirements, the Proponent appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant, led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to undertake the EIA and EMP to support the application for Environmental Clearance Certificate (ECC). The current ECC as shown in Fig. 1.1 granted on the 27th July 2018 and expired in July 2021 and need to be renewed.

This updated Environmental Management Plan (EMP) Report covering the ongoing mining and exploration operations and all the supporting infrastructures such as roads and water supply within the ML 167 has been prepared to support the application for the renewal of the current ECC as shown in Fig. 1.1.

The proponent shall meet all the applicable national legislative, regulatory and policies frameworks, standards and protocol with respect to the activities of the current and future exploration, operation, closure, rehabilitation and aftercare stages. It is hereby recommended that throughout the ongoing mining operations project lifecycle, the developer shall follow the provisions of all the relevant national regulatory frameworks.

1.3.2 Summary of the Regulatory Register

The following is the summary of the relevant and applicable national policies, legislations and regulation as well as regional (Southern Africa Development Community –SADC) treaties and protocols:

1. The Constitution of Namibia.
2. Environmental Management Act, No. 7 of 2007.
3. Nature Conservation Ordinance, No. 4 of 1975 (as emended).
4. Forest Act, No. 12 of 2001.
5. Atmospheric Pollution Prevention Ordinance, No. 11 of 1976.
6. Electricity Act, No. 4 of 2007.
7. Foreign Investment Act, No. 27 of 1990 (as emended by Foreign Investment.
8. Amendment Act 24 of 1993).
9. Soil Conservation Act, no. 76 or 1969 as amended in South Africa to March 1978.
10. Hazardous Substances Ordinance, No. 14 of 1974.
11. Road Traffic and Transport Act, No. 22 of 1999.
12. Labour Act, No. 11 of 2007 (including Health and Safety Regulations).
13. Minerals (Prospecting and Mining) Act, No. 33 of 1992.
14. Petroleum Products and Energy Act, No. 13 of 1990.
15. Public Health Act, No. 36 of 1919.
16. Regional Councils Act, No. 22 of 1992.
17. Mines, Works and Minerals Ordinance, No. 20 of 1968: Regulations (GN143, GG2927 of 01 October 1968).
18. Water Act, No. 54 of 1956.

19. Namibia Water Corporation Act, No. 12 of 1997.

20. National Heritage Act, No. 27 of 2004.

21. National Environmental Health Policy, 2002.

22. Minerals Policy of Namibia, 2003.

23. Policy for the Conservation of Biotic Diversity and Habitat Protection, 1994.

24. Waste Management Policy.

25. Policy for Prospecting and Mining in Protected Areas and National Monuments.

26. Convention on the Protection of Biological Diversity.

27. Vienna Convention for the Protection of the Ozone Layer, 1985.

28. United Nations Framework Convention on Climate Change, 1992.

29. Kyoto Protocol on the Framework Convention on Climate Change, 1998.

30. Basel Convention on the Control of Transboundary Movement of Hazardous.

31. Wastes and their Disposal, 1989.

32. Southern African Development Community: Protocol on Mining, and.

33. Southern African Development Community: Protocol on Energy.

1.4 Location, Site Description, Land Use and Infrastructure

1.4.1 Location

The ML No. 167 is located in central Namibia, approximately 180 km east of the Atlantic Ocean (Fig. 1.2). The ML No. 167 is located within the Karibib Constituency (or Karibib Magisterial District) in the Erongo Region of Namibia. The Karibib Constituency's district capital, and principal town, is the town of Karibib, which is approximately 30 km to the northwest of the ML 167 (Fig. 1.3). Swakopmund, the regional centre of the Erongo Region and Walvis Bay the main Port, are situated about 170 km and 200 km to the west of the ML area. Namibia's capital city, Windhoek, is located approximately 124 km southeast of ML No. 167 Area (Figs. 1.2). The ML No. 167 covers a total area of 766 Ha. The renewal application will be covering the area boundary of the current ML No. 167 with no changes to the areas covered (Figs. 1.3 -1.5). The ML No. 167 covers the following four (4) farms as shown in Fig. 1.5:

- Habis No. 71,
- Abbabis No. 70,
- Neikhoes No. 74, and.
- Etusis No. 75.

The ML No. 167 is almost surrounded by the ML 209 application belonging to Omusati Granite (Pty) Ltd and borders the ML 142 belonging to Namibia Marble and Granite (Pty) Ltd to the east.

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

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26 July 2018

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Manager
Omusati Granite (Pty) Ltd
P O Box 90979
Klein Windhoek
Windhoek

Dear Sir/Madam

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE PROPOSED DIMENSION STONE (MARBLE) MINING LICENSE NO. 167, AND ONGOING EXPLORATION, KARIBIB DISTRICT, ERONGO REGION

The Environmental impact assessment and Environmental Management Plan submitted are sufficient as they have made an adequate provision of the environmental management for the proposed activities. From this perspective, regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project.

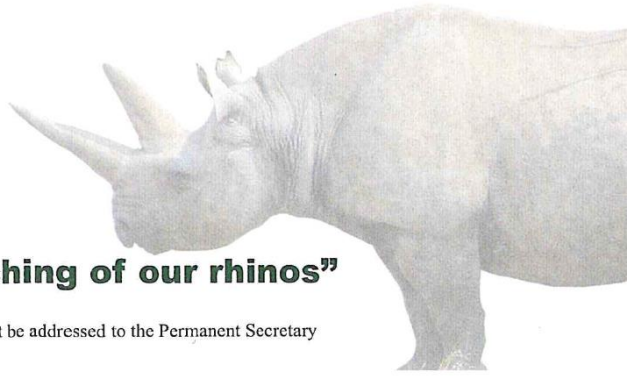
On the basis of the above, this letter serves as an environmental clearance certificate for the project to proceed. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Omusati Granite (Pty) Ltd and their consultants.

This environmental clearance is valid for a period of (three) 3 years, from the date of issue unless withdrawn by this office.

Yours sincerely,

P/Bag 13306
Windhoek, Namibia
2018 -07- 27
Office of the
Environmental Commissioner

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER



"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

Figure 1.1: Copy of the ECC granted on the 27th July 2018 to Omusati Granite (Pty) Ltd expired in July 2021 and need to be renewed.

Figure 1.2: Regional location of the ML No. 167.

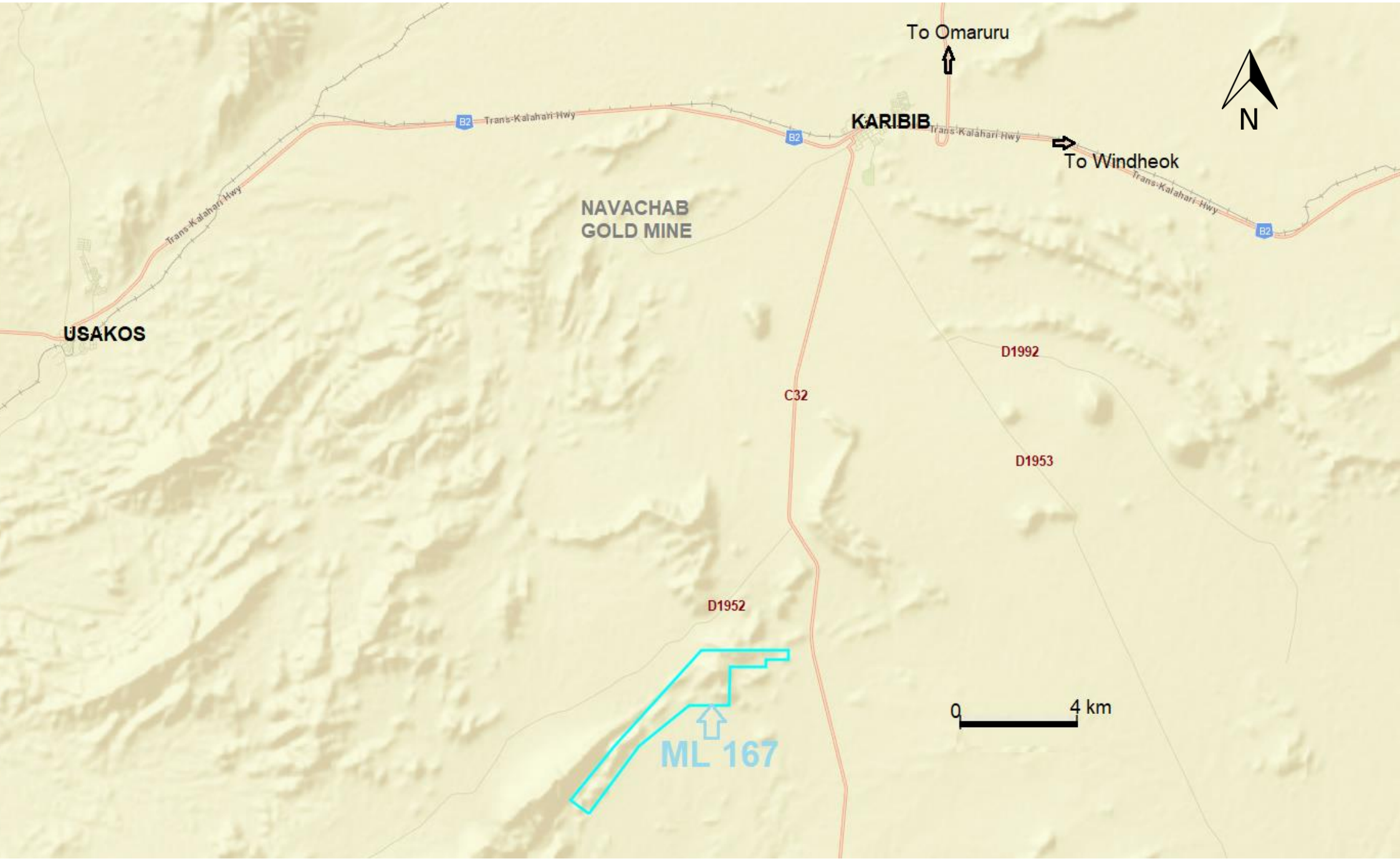


Figure 1.3: Regional location of the ML 167 and existing access roads (Source: http://portals.flexicadastre.com/Namibia/, 2021).

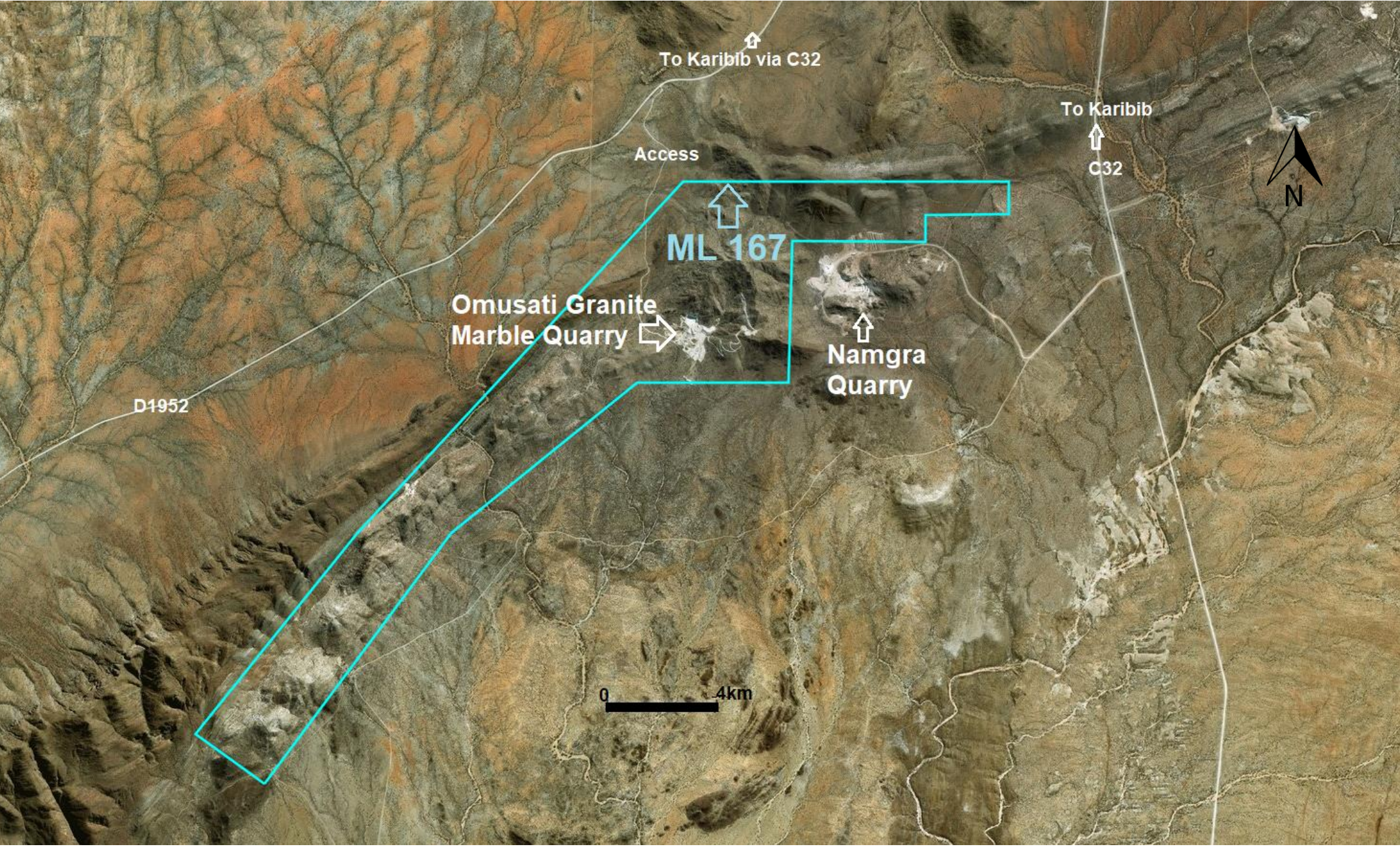


Figure 1.4: Detailed overview location the ML No. 167 (Source: http://portals.flexicadastre.com/Namibia/, 2021).

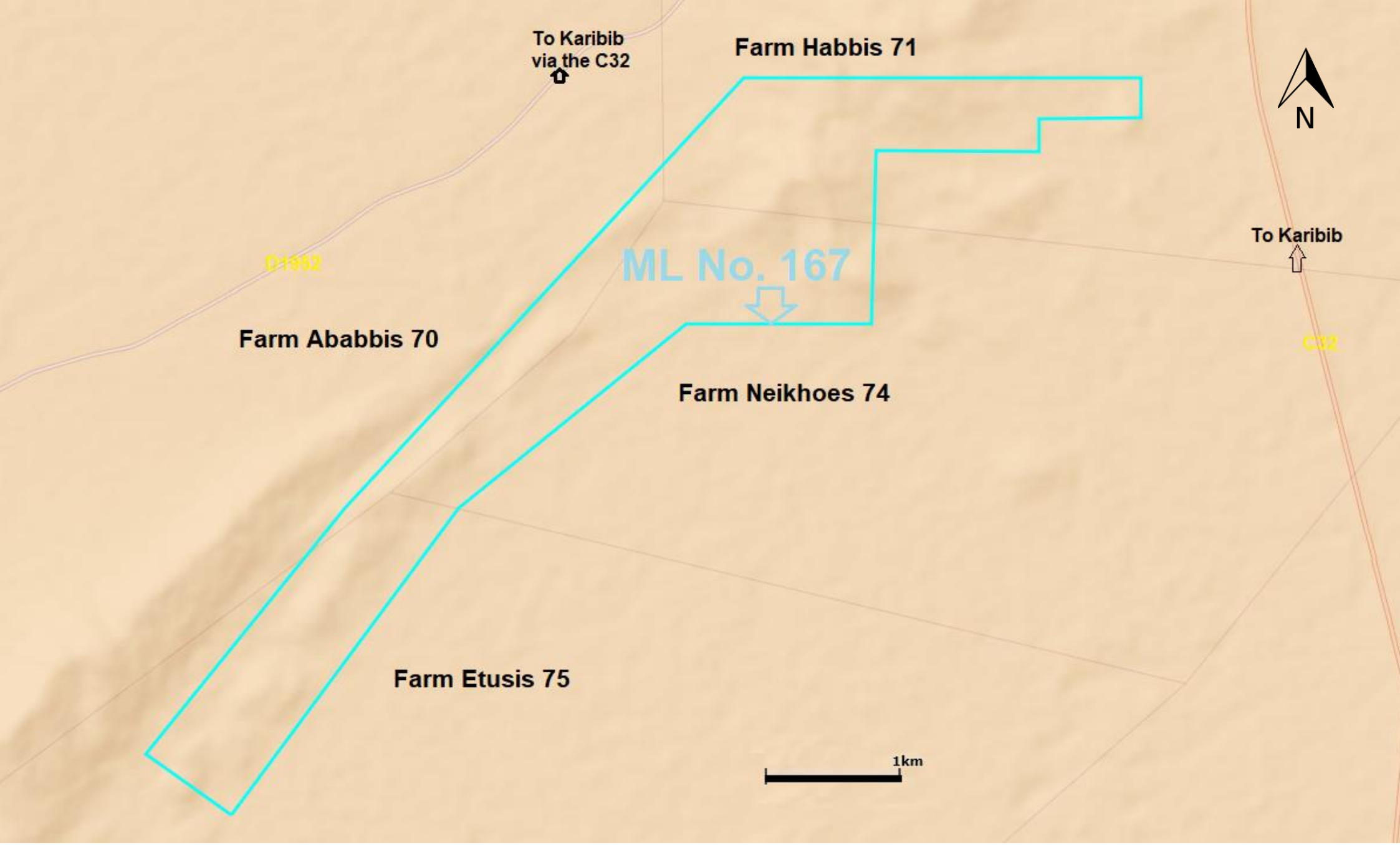


Figure 1.5: Farms covered by the ML No. 167 area (Source: http://portals.flexicadastre.com/Namibia/, 2021).

1.4.2 Current Land Uses

The general land use of the ML area is mainly dominated by agriculture (cattle and small stock framing) and dimension stone (marble and granite) exploration and mining activities in the general area.

Although not necessary within the ML area, privately owned Safari Game Farms / Game Hunting Farms are found in the general surrounding areas. The Etusis Lodge is one such facility situated on Farm Etusis No. 75 falling outside the ML No. 167.

Lodging and camping facilities such as the facilities found on Etusis Farm are a key source of rural employment and support tourism in the Erongo Region. The game farms are also important conservation areas for endemic and protected flora and are sanctuaries for endangered faunal species. The game farms offer visitors the opportunity to be close to nature with a variety of tailor-made tourism products such game viewing, trails and hunting activities.

The summary of other land uses activities found in the general areas includes: Commercial agriculture, dimension stone (marble) mining (Omusati Granite Quarry in ML 167 (Plates 1.1 -1.3) and Namgra Quarry (Plate 1.4) in ML 142), tourism and hospitality (Etusis Lodge and Campsite).

1.4.3 Supporting Infrastructure and Services

The ML area is accessible via the B2 road linking the towns of Okahandja and Karibib, the C32 road link the towns of Karibib to the ML No. 167 area (Figs. 1.2-1.5). The Town of Karibib is the nearest town to the ML areas (Figs 1.2-1.5). The property is accessible via tarred road from Windhoek (c.180 km, 2.5-hour drive) or from Walvis Bay/Swakopmund (c.200 km, 2.5-hour drive).

The B1 and B2 national highways pass through Karibib; from here a 1.5 km paved C32 road going south becomes an all-weather and well-maintained gravel road. Within the Project area, access is provided via a series of poorly maintained roads and 4 wheel-drive tracks.

Access and transportation, whether by road or rail, are easily accessible within the region and within Namibia. The nearest railhead is at Karibib. Daily scheduled air services connect Johannesburg to Walvis Bay and Windhoek. Daily flights also connect Windhoek to some major EU cities (e.g., Frankfurt, Amsterdam).

Plate 1.1: Overview of the current operational Omusati Granite marble quarry.

Plate 1.2: Detailed aerial view of the operational Omusati Granite marble quarry.

Plate 1.3: Operational process at Omusati Granite marble quarry.

Plate 1.4: Namgra marble quarry in ML 142 situated immediately to the north east of the Omusati Granite quarry.

2. THE EMP FRAMEWORK

2.1 Summary Objectives

This Environmental Management Plan (EMP) provides a detailed plan of actions required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for the successful implementation of environmental management strategies by the Omusati Granite (Pty) Ltd.

2.2 Limitations of this EMP

This EMP only covers the mining operations, ongoing exploration, supporting activities within the ML 167 and the transportation of the mined marble blocks to the processing plant but does not cover the activities associated with the processing of the marble at the processing plant in Karibib or Walvis Bay and the transportation of the finished products thereof, for export through the Port of Walvis Bay.

2.3 EMP Management Linkages

The Environmental Management Plan, described in this Report, is based on the findings as outlined in the Environmental Impact Assessment Report. The EMP must be continuously updated during the implementation of the ongoing mining and exploration operations. Within the framework of the existing Environmental Policy of Omusati Granite (Pty) Ltd, the EMP is to be incorporated in the Environmental Management System (EMS) of the company. This EMP incorporates the Environmental Policy of Omusati Granite (Pty) Ltd, Namibian Environmental regulations and policies as well as international environmental best practices in mining development, operational, rehabilitation, closure and aftercare activities.

2.4 The EMP Framework

An Environmental Management Plan (EMP) is one of the most important outputs of the environmental assessment process and is the synthesis of all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. The aim of the EMP is to assist Omusati Granite (Pty) Ltd Energy (Pty) Ltd (the Proponent), Contractors and Subcontractor to ensure that the day-to-day operations as well as medium to long term strategies are carried out in an environmentally responsible manner, thereby preventing, or minimizing the negative effects and maximizing the positive effects of the project-related activities on the natural environment.

It's highly imperative that there is an effective and response organisational structure of Omusati Granite (Pty) Ltd that defines the roles, responsibilities and authority to implement the provisions of this EMP. The summary of such a structure is shown in Fig. 2.1. Provision has also been made, on an ongoing basis, for sufficient management support and human and financial resources. Separate EMPs have been prepared for the project: an EMP for the upgrade and/or construction, including rehabilitation, of access road(s) to and from the ongoing mining and exploration operations. and EMPs for the Construction, Operations and Decommissioning/Closure / Aftercare Phases of the ongoing mining and exploration operations.

The EMPs are presented as comprehensive matrices: for each **Activity/Process** and related **Aspects** (defined by the International Organization for Standardization ISO 14001:2004 as *element of an organization's activities or products or services that can interact with the environment*. environment is defined as *surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation*) and **Impacts** (*any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects*), **Management Actions** required to address the impacts arising directly and indirectly from the various aspects of the ongoing mining project, with **Responsible Persons** and **Timing** for each, are listed.

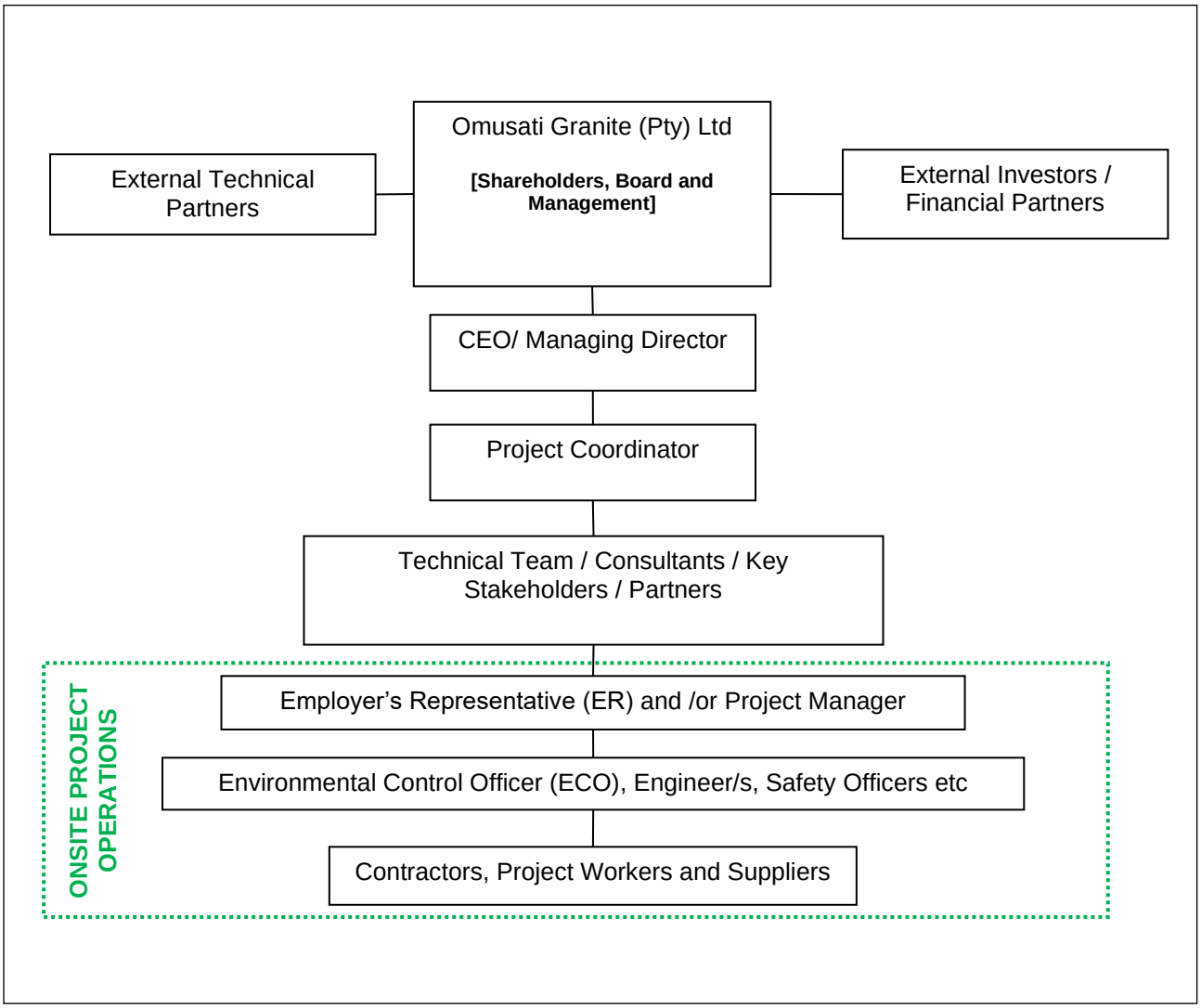


Figure 2.1: Omusati Granite (Pty) Ltd organisational structure for the ongoing mining operations with respect to the implementation of the EMP.

2.5 Summary of Impacts Assessment Methodology

The following is the summary of the ongoing mining operations developmental stages that have been assessed in this environmental assessment process covering the EIA and the development of the EMP phases:

(i) Preconstruction.

(ii) Construction.

(iii) Operation, ongoing exploration, monitoring and rehabilitation.

(iv) Decommissioning, closure and aftercare.

The detailed outline of all the activities associated with each of the above project developmental stages as sources of potential environmental impacts are outlined in Table 2.1. The impact assessment methodology has adopted a two-dimensional matrix approach in predicting the potential impacts of the ongoing mining operations on the receiving environment. The two-dimensional matrix consisted of the following cross-referencing:

- The activities linked to the project that are supposed to have an impact on man and the environment.

- ❖ The existing environmental and social conditions that could possibly be affected by the project.

The impact assessment considerations included land disturbance/land use impacts. potential impacts to specially designated areas. impacts to soil, water, and air resources. impacts to vegetation, wildlife, wildlife habitat, and sensitive species. visual, cultural, paleontological, socioeconomic and potential impacts from hazardous materials.

2.6 Summary of Impact Assessment Results

To determine the likely environmental impacts as well as the overall significant impact of individual sources associated with the ongoing marble mining, ongoing exploration operations and supporting infrastructure activities within the ML 167 (Table 2.1), an impact identification and assessment process was undertaken as detailed in the EIA report.

The results of the overall impacts and key issues associated with the ongoing mining operations / sources of potential impacts with respect to the receiving environment that could potentially be affected are presented in Table 2.2.

The EIA significant impact identification and assessment processes focused on the environment interaction approach with respect to the ongoing mining operations, the pathways and the likely targets or receptor. In this process, components of the project activities that are likely to impact the natural environment (physical, biological, and socioeconomic) were broken down into individual development stages and activities.

The results of the overall significant impacts assessment associated with the ongoing mining operations / sources of potential impacts with respect to the receiving environment that could potentially be affected are presented in Table 2.3. The summary of key potential environmental concerns expected during the preconstruction, construction, operation, ongoing exploration, monitoring and rehabilitation, decommissioning, closure and aftercare stages are outlined in Table 2.4.

Table 2.1: Outline of the ongoing mining and exploration operations and all the associated activities as sources of potential environmental impacts.

PROJECT PHASE	DEVELOPMENT ACTIVITIES FOR EACH PHASE	
PRECONSTRUCTION	1. General site clearing, administration block, waste rock, supporting infrastructure (Office blocks, water, and electricity) other site infrastructure	
	2. Access roads clearing / upgrading 3.	
	4. Top soil removal and storage	
	5. Development of the temporary construction camp	
	6. Installation of campsites, offices, workshops, storage facilities.	
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads
		2. Supporting site infrastructure including foundations and fencing
		3. Waste rock stockpiles
		4. Groundwater water supply systems
		5. Local generator areas for power infrastructure
		6. Administration blocks
		7. Fuel supply and storage / yard
		8. Workshop and equipment maintenance facilities
		9. Wastewater treatment systems
		10. Solid waste transfer facility (No Municipal Waste disposal shall be developed on Site)
		11. Storm water management around the pit, waste rock and supporting infrastructure
	MINE WORKINGS	1. Excavation as maybe required to create direct access to the marble
		2. Actual pit excavation and stripping of the overburden to create direct access to fresh marble
		3. Marble production for test mining operations
		4. Test mining and commissioning
OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation as maybe required)	
	2. Transportation of the mined materials from pit to the yard for sorting	
	3. Transportation of the 5m^3 mined marble blocks to the sorting yard / storage facility and later to be further transported for processing in either Karibib or Walvis Bay	
	4. Operations of the waste rock	
	5. Ongoing exploration support	
	6. Ongoing rehabilitation and maintenance	
	7. Waste water and sludge management	
	8. Environmental Monitoring on the overall receiving environment	
DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	
	2. Closure of open pits through backfill and fencing	
	3. Closure of waste rock stockpile and used for backfilling	
	4. Closure of storage, yard and municipal solid waste transfer sites	
	5. Decommissioning of water and electricity infrastructure	
	6. Overall land reclamation	
	7. Restoration of internal roads	
	8. Revegetation and aftercare as may be required	

Table 2.2: Matrix impact assessment results of the ongoing mining, exploration and supporting infrastructure activities.

SCALE	DESCRIPTION
0	no observable effect
1	low effect
2	tolerable effect
3	medium high effect
4	high effect
5	very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE		ACTIVITIES	Natural Environment – Air, Noise, Water, Green Space	Built Environment – Houses, Transport Systems,	Socioeconomic- Job, Investment, Taxes and Social Issues e.g. HIV&Aids	Archaeological and Cultural Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
				RECEPTORS / TARGETS THAT MAY BE IMPACTED							
				PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
	PRE-CONSTRUCTION		1. General site clearing, administration block, waste rock, supporting infrastructure	3 (-)	1 (-)	3 (+)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Access roads clearing / upgrading	3 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Top soil removal and storage	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. Development of the temporary construction camp	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			5. Installation of campsites, offices, workshops, storage facilities.	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Supporting site infrastructure	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Waste rock stockpiles	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. Groundwater water supply systems	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			5. Local generator areas for power infrastructure	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			6. Administration blocks	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			7. Fuel supply and storage / yard	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			8. Workshop and equipment maintenance facilities	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			9. Wastewater treatment systems	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			10. Solid waste transfer facility	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			11. Storm water management around the pit, waste rock and supporting infrastructure	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		MINE WORKINGS	1. Excavation as maybe required to create direct access to the marble	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Actual pit excavation and stripping of the overburden to create direct access to fresh marble	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Marble production for test mining operations	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			4. Test mining and commissioning	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)

Table 2.2: *Cont.*

SCALE	DESCRIPTION
0	no observable effect
1	low effect
2	tolerable effect
3	medium high effect
4	high effect
5	very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space	Built Environment – Houses, Transport Systems,	Socioeconomic- Job, Investment, Taxes and Social Issues e.g. HIV&Aids	Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation as maybe required)	• 3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		2. Transportation of the mined materials from pit to the yard for sorting	3(-)	1(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		3. Transportation of the 5m^3 mined marble blocks to the sorting yard / storage facility and later to be further transported for processing in either Karibib or Walvis Bay	3(-)	1(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		4. Operations of the waste rock	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		5. Ongoing exploration support	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		6. Ongoing rehabilitation and maintenance	2(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		7. Waste water and sludge management	2(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		8. Environmental Monitoring on the overall receiving environment	1(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	0(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		2. Closure of open pits through backfill and fencing	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		3. Closure of waste rock stockpile and used for backfilling	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		4. Closure of storage, yard and municipal solid waste transfer sites	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		5. Decommissioning of water and electricity infrastructure	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		6. Overall land reclamation	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		7. Restoration of internal roads	2(+)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		8. Revegetation and aftercare as may be required	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)

Table 2.3: Significant matrix impact assessment results for mining, exploration and supporting infrastructure activities.

IMPACT SEVERITY	IMPACT LIKELIHOOD: Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES		RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space	Built Environment – Houses, Transport Systems,	Socioeconomic- Job, Investment, Taxes and Social Issues e.g. HIV&Aids	Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. General site clearing, administration block, waste rock, supporting infrastructure		B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		2. Access roads clearing / upgrading		B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		3. Top soil removal and storage		B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		4. Development of the temporary construction camp		B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
		5. Installation of campsites, offices, workshops, storage facilities.		B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			2. Supporting site infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			3. Waste rock stockpiles	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4. Groundwater water supply systems	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			5. Local generator areas for power infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			6. Administration blocks	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			7. Fuel supply and storage / yard	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			8. Workshop and equipment maintenance facilities	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			9. Wastewater treatment systems	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			10. Solid waste transfer facility	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			11. Storm water management around the pit, waste rock and supporting infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
		MINE WORKINGS	1. Excavation as maybe required to create direct access to the marble	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			2. Actual pit excavation and stripping of the overburden to create direct access to fresh marble	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			3. Marble production for test mining operations	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			4. Test mining and commissioning	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)

Table 2.3: *Cont.*

IMPACT SEVERITY	IMPACT LIKELIHOOD: Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space	Built Environment – Houses, Transport Systems,	Socioeconomic- Job, Investment, Taxes and Social Issues e.g. HIV&Aids	Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation as maybe required)	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		2. Transportation of the mined materials from pit to the yard for sorting	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		3. Transportation of the 5m^3 mined marble blocks to the sorting yard / storage facility and later to be further transported for processing in either Karibib or Walvis Bay	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		4. Operations of the waste rock	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		5. Ongoing exploration support	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		6. Ongoing rehabilitation and maintenance	B2 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		7. Waste water and sludge management	B2 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		8. Environmental Monitoring on the overall receiving environment	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		2. Closure of open pits through backfill and fencing	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		3. Closure of waste rock stockpile and used for backfilling	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		4. Closure of storage, yard and municipal solid waste transfer sites	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		5. Decommissioning of water and electricity infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		6. Overall land reclamation	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		7. Restoration of internal roads	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		8. Revegetation and aftercare as may be required	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)

Table 2.4: Summary of the selected key potential environmental impacts likely to be associated with ongoing marble mining, ongoing exploration, and infrastructural supporting activities in the ML 167.

ENVIRONMENTAL IMPACT OR ISSUE	SIGNIFICANCE RATING BEFORE & AFTER MITIGATION
1. Impacts on air quality: dust (PM_{10} & dust outfall including metals)	Medium (-) Low with mitigation
2. Impacts on soil / habitats/ ecosystem	Medium (-) Low with mitigation
3. Impacts on flora / habitats/ ecosystem	Low (-) Can be avoided
4. Impacts on invertebrates/ habitats/ ecosystem	Medium (-) Probably reducible
5. Impacts on reptiles/ habitats/ ecosystem	Medium (-) Probably reducible
6. Impacts on birds/ habitats/ ecosystem	Medium (-) Low with mitigation
7. Impacts on mammals/ habitats/ ecosystem	Medium (-) Low with mitigation
8. Impact on groundwater levels / resource	Low (-)
9. Impacts on groundwater quality (offices, ablutions, waste, refuelling)	Medium (-) Low if mitigated
10. Impacts on groundwater quality	Medium (-) Low if mitigated
11. Impacts on groundwater quality (from rock waste drainage)	Medium (-) Low if mitigated
12. Impacts on volumes of surface runoff	Low (-)
13. Impacts on surface water quality	Medium (-) Low if mitigated
14. Impacts of solid and liquid waste	Medium (-) Low if fully compliant
15. Electricity demand	Low (-) but may be further reduced
16. Visual impacts and lighting	Medium (-) Low with mitigation
17. Impacts of water demand	Medium (-)
18. Impacts of water supply pipeline	Low (-) but may be further reduced
19. Road traffic and NamPort Walvis Bay Port	Low (-)
20. Mine rehabilitation, closure and aftercare	Medium (+) Must be a condition of approval
21. Local positive socioeconomic including benefits of direct employment	High (+) Medium term
22. Regional (Erongo region) and National (Namibia) overall positive socioeconomic benefits	High (+) Medium term
23. Impacts related to other land users / conflict / coexistence	Medium (-) Reducible to Low
24. Negative Socioeconomic and HIV/AIDS	Low (-)
25. Occupational Health and Safety	Low (-)
26. Emergency Response Plan	Low (-)

3. PRECONSTRUCTION TO MINE AFTERCARE EMP

3.1 Introduction

This section contains the Environmental Management Plan (EMP) for the preconstruction activities. The main activities of the preconstruction stage will be the bush clearing, upgrading and/or construction, including rehabilitation, of access road(s) to and from the ongoing mining and exploration operational areas as well as other mine supporting infrastructures. Table 2.1 outlines the EMP framework for the ongoing mining and exploration operations.

3.2 Roles and Responsibilities

3.2.1 Employer's Representative (ER) / Project Manager (PM)

Omusati Granite (Pty) Ltd is to appoint an **Employer's Representative (ER)** with the following responsibilities:

- Act as the Employer's (Omusati Granite (Pty) Ltd) on-site project manager and implementing agent.
- Appoint the Environmental Control Officer (ECO).
- Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation and the EMP for the preconstruction stage).
- Ensure that all the necessary environmental authorizations and permits have been obtained.
- Assist the Contractor in finding environmentally responsible solutions to challenges that may arise (with input from the ECO).
- Should the ER believe a serious threat to, or impact on the environment may be caused by the construction operations, he/she may stop work. the Employer must be informed of the reasons for the stoppage as soon as possible.
- The ER has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP.
- Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the ER can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied.
- Report to the Employer on the implementation of this EMP on site (with input from the ECO and/or independent environmental auditor).
- Maintain open and direct lines of communication between the Employer, ECO, Contractor and Interested and Affected Parties (I&APs) with regards to environmental matters, and.
- Attend regular site meetings and inspections.

3.2.2 Environmental Control Officer (ECO)

The **Environmental Control Officer (ECO)** has the following responsibilities:

- Assist the ER in ensuring that the necessary environmental authorizations and permits have been obtained.
- Assist the ER and Contractor in finding environmentally responsible solutions to challenges that may arise.

- ❖ Conduct environmental monitoring as per EMP requirements.
- ❖ Recommend on the issuing of fines for transgressions of basic conduct rules and/or contraventions of the EMP to the ER.
- ❖ Advise the ER on the removal of person(s) and/or equipment not complying with the specifications of the EMP.
- ❖ Carry out regular site inspections (on average once per week) of all construction areas with regards to compliance with the EMP. report any non-compliance(s) to the ER as soon as possible.
- ❖ Organize for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through the construction period. audit reports to be submitted to the ER.
- ❖ Organize for an independent post-construction environmental audit to be carried out.
- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document.
- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site.
- ❖ Keep records of all activities related to environmental control and monitoring. the latter to include a photographic record of the preconstruction and environmental control and rehabilitation process, and a register of all major incidents, and.
- ❖ Attend regular site meetings.

3.2.3 Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** include:

- ❖ Comply with the relevant legislation and the EMP for the preconstruction activities.
- ❖ Preparation and submission to Omusati Granite (Pty) Ltd of the following Management Plans:
    - o Environmental Awareness Training and Inductions.
    - o Emergency Preparedness and Response
    - o Waste Management, and.
    - o Health and Safety.
- ❖ Ensure adequate environmental awareness training for senior site personnel.
- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement. the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:
    - o The importance of complying with the relevant Namibian, International and Best Practice Legislation.
    - o Roles and Responsibilities, including emergency preparedness.
    - o Basic Rules of Conduct (Do's and Don'ts).
    - o EMP: aspects, impacts and mitigation.

- Fines for Failure to Adhere to the EMP, and.
- Health and Safety Requirements.

❖ Record keeping of all environmental awareness training and induction presentations, and.

❖ Attend regular site meetings and environmental inspections.

3.3 Mitigation Measures for Significant Impacts

The impact assessment covered in the EIA and the mitigation measures presented in this Updated EMP reports have been undertaken in line with the following envisaged ongoing marble mining, ongoing exploration and supporting infrastructures developmental stages (ongoing mining operations project lifecycle):

(i) Preconstruction.

(ii) Construction.

(iii) Operation, ongoing monitoring and rehabilitation, and.

(iv) Decommissioning, closure and aftercare.

The following approach is taken regarding the concept of whether assessed key issues need to be actively addressed in the EMP:

❖ If environmental aspects are evaluated to be of low significance, they do not require specific management plans, and need not be actively addressed in the EMP (although they may still be listed and reported on).

❖ A decision on the need to actively address any issue with a "Medium" significance ranking will require consideration of other relevant factors, such as the nature of the impact, risks associated with possible cumulative aspects, and the degree of concern of stakeholders, and.

❖ If environmental aspects receive a "High" significance ranking, they must be addressed by means of active management, mitigation or rehabilitation measures.

For each negative impact of high or medium significance, mitigation objectives are set (i.e. ways of reducing negative impacts), and attainable management actions are subsequently addressed in the EMP for mining and prospecting. Without management, these impacts would either breach statutory limits or be unacceptable to statutory authorities or to stakeholders, as they would result in a significant deterioration of one or more environmental resources.

Based on the results of the impact assessment undertaken in the EIA report, the following is the summary of the key issues that have been assessed to have likely significance impacts on the receiving environment throughout the ongoing mining operations project lifecycle (Tables 3.1 - 3.15):

1. Pollution from routine operations and accidental incidences (Table 3.1).
2. Waste management (Table 3.2).
3. Stripping and stockpiling soils (Table 3.3).
4. Tracks and roads construction and access (Table 3.4).
5. Water abstraction and supply (Table 3.5).

6. Flora, habitat and ecosystem (Table 3.6).
7. Fauna habitat and ecosystem (Table 3.7)
8. Noise (Table 3.8)
9. Dust (Table 3.9)
10. Visual (Table 3.10).
11. Neighbouring communities and or the public (Table 3.11).
12. Archaeological, historical, and cultural heritage resources (Table 3.12).
13. Office, workshop, and all related sanitation (Table 3.13).
14. Final mine, exploration and supporting infrastructure rehabilitation, closure, and aftercare (Table 3.14), and.
15. Mine components to be addressed in the ongoing and final mine closure plan (Table 3.15).

Detailed mitigation measures for each of the above (1) to 15) key issues have been prepared and presented in Tables 3.1 – 3.15 for implementation by the proponent.

Table 3.1: Pollution from routine operations and accidental incidences from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
1) Accidental/ Negligent Spillage's	Vehicles, earthmoving equipment	• Spillage's of any potentially toxic materials, whether by accident or through negligence, should be reported immediately and corrective action undertaken • Design structures and transfer equipment so as to avoid as much spillage's as possible • Train staff on how to make diesel/fuel transfer avoiding spillage's • Any spill should be cleaned up immediately by removing the spill together with the polluted soil and disposing of it at a recognised dumping facility to the satisfaction of the MET	Weekly monitoring of all equipment (visual check)	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
2) Workshop and Equipment Area	Generators, vehicles, earthmoving equipment	• Oil traps will be installed in all appropriate places to collect potentially toxic materials • All diesel generators on site will be placed on concrete slabs • The entire work area of the workshop must be lined by concrete • Any runoff from the workshop/plant area, either arising from washdowns or rainfall, should be channelled into the pollution control pond	Weekly monitoring of the workshop and plant area (visual check)		

Table 3.2: Waste management from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
3) Domestic waste (visual and ecological impacts of refuse littering, domestic waste disposal)	Workforce	• Non-biodegradable and biodegradable refuse shall be stored in a container / refuse skip and collected on a regular basis and disposed of at a recognised disposal facility. Precautions shall be taken to prevent any refuse from spreading on and from the camp site. The container should also be covered with a mesh "lid" to control access by pest animals	Weekly monitoring of the containers/ when full transport it to a recognised waste disposal facility	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
4) Industrial waste (including scrap metal)		• Store the waste at a site close to the workshop • Remove it to a recognized waste disposal facility on a regular basis	Three monthly assessment of the generated quantities. Remove if more than $20m^3$		

Table 3.3: Stripping and stockpiling soils from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
5) Stripping and stockpiling (dust and covering of gravel areas with stockpiles)	New pits	• The upper layer of the soil will be valuable to the rehabilitation process because it contains a seedbank of dormant seeds. • This layer must be stripped and stockpiled separately • The soil stock pile will be surrounded by larger blocks to protect from wind erosion	Visual check on wind erosion/ control of plastic sheeting on a three monthly basis	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
6) Waste rocks (70% of mined pits)		• Design for closure principles • Separate waste rocks as well as stockpiled soils in order to allow easy rehabilitation • Follow closely the market demands in the world so as to avoid unnecessary storage of blocks	Measure the aerial extent and the height of the waste pile, at least once a year		

Table 3.4: Tracks and roads construction and access from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
7) Fixed route (potential damage to the substrate caused by heavy vehicles and off-road vehicles)	Vehicles, Trucks, Earthmoving equipment	• Haphazard driving across the veld where there are no existing routes must be avoided. • The use of fixed routes will reduce the visual impact and minimise the need for post-mining rehabilitation of the tracks	Weekly visual check	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
8) Road Safety (Safety of surrounding residents and land users, other motorists and animals must not be compromised by the vehicles associated with the mining operation)	Vehicles, Trucks, Earthmoving equipment	• Headlights must be switched on at all times • All vehicles, trucks moving in the mining area should not exceed 40km/h with warning and speed signs at relevant locations • All personnel responsible for driving the transport vehicles must be in a possession of a valid driver's licence • Access points off the gravel road to the mining area should be well signposted in advance	Daily monitoring (visual checks)		
9) Haul Road Utilisation (Source of various forms of pollution: dust, noise, visual)	Vehicles, Trucks, Earthmoving equipment	• Drivers may not exceed the general speed limit along the haul road of 40 km/h • There should be no littering along the road, dumping of waste and scrap, etc. and all drivers should be made aware of this	Daily monitoring (visual checks)		

Table 3.5: Water abstraction and supply from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
10) Water abstraction and pipelines	Mining activities	• Pipelines laid to a site shall be done in such a manner that the surface and natural vegetation are not unduly disturbed	Weekly visual checks on possible spillage's	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
11) Water effluent	Camp site and administration block	• All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain situated as far as possible, but not less than 50 m, from a stream, river, pan, dam or borehole. Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility	Weekly inspections of the drain		
12) Water storage on site	Reservoirs	• Concrete reservoir walls must be painted in a camouflage colour to aid in concealing it • Reservoirs should be covered to reduce evaporation • Reservoirs should not be visible from the main road	Weekly visual checks of the reservoirs		
13) Water conservation strategies (including recycling)	Work related cutting, cooling, washing,	• Water should be recovered from the cutting, cooling and washing stages • Advice the workforce to be sparing with the water for human consumption	Check the domestic water consumption on a three monthly basis		

Table 3.6: Flora, habitat, and ecosystem from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
14) Preservation of communities (to ensure minimal disruption of important vegetation communities and valuable plant specimens)	Vehicles, trucks and earthmoving equipment Clearance for firewood	• Alternative fuel and/or power sources must be made available (paraffin stoves, diesel-driven generators) if workers are accommodated on site • No trees or shrubs will be felled or damaged for the purpose of obtaining firewood • Haphazard driving across the veld where there are no existing routes must be avoided	Daily inspections Weekly check whether the stock of alternative sources is sufficient	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
15) Sources of plant material for rehabilitation (to ensure the maximum use of the local plant material for rehabilitation process)	New pits	• Before new site construction begins, the upper layer of the soil must be stripped and stockpiled separately so that this layer can be utilised in the rehabilitation process	Visual check on wind erosion on a monthly basis		

Table 3.7: Fauna, habitat, and ecosystem from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
16) Impacts on resident animals, habitat and overall ecosystem	Mining operations	• No hunting and trapping will be allowed • Fence off the pits (the fences must be sufficient to control the access of large and small animals) or alternatively put a berm with waste material	Weekly visual check of the fence	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line

Table 3.8: Noise from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
17) Impacts on adjacent settlements/ workforce	Generator, earthmoving equipment, cutting equipment, blasting	• The generator should be positioned away from the base camp and has boarding to help suppress noise • Blasting should be limited to the strict necessary and should be in compliance with the Explosive Act, 1961.	Weekly "hearing" check of the generator and other equipment (trucks/ cutting machinery)	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line

Table 3.9: Dust from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
18) Impacts on air quality in general/ flora & fauna/ workforce	Excavation areas including pits and trenches, vehicles	• The general speed limit on the haul road should be 40km/h if possible	Daily (visual) monitoring of transport activities and dust generation on the mine	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line

Table 3.10: Visual impacts from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
19) Impacts on surrounding land users/ tourists	Waste & stockpile dumps/ dust/ Infrastructure	• Sites to be established away from the tourist routes • Limit the height and aerial extent of the waste and stockpile dumps (may not visible from the road) • Ensure that all structure on site is blending with the surrounding landscape • Minimise dust generation from vehicles on the haul road so as not to draw attention to this area	Measure the aerial extent and the height of the waste pile, at least once a year Daily visual checks	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line

Table 3.11: Neighbouring communities and or the public from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
20) Informal settlements/ tourists	Noise/ dust/ visual impacts/ attitude	• Enhance communication with the neighbouring communities • Assist communities where possible	Visit the communities at least once a month to maintain good relationship	Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management budget line

Table 3.12: Archaeological, historical, and cultural heritage from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
21) Impacts on archaeological and cultural heritage sites	Mining, exploration blasting/ drilling	• Careful examination of the area before any blasting and/ or drilling is undertaken. Immediately advice the National Monuments Council if archaeological and/ or cultural heritage sites are found	Thorough inspection of rocks before any drilling and/ or blasting is undertaken	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management budget line

Table 3.13: Office, workshop and all related sanitation from preconstruction to mine closure.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
22) Accommodation	Camp and office sites	• no camp or office site shall be located closer than 50 meters from a spring, river, dam or pan • The area required for the camp and office site must be kept to a minimum	Visual Inspection and Monthly Water Quality Test	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management budget line
23) Sanitation (Impacts on water pollution)	All staff	• Chemical toilet facilities (preferred) or other approved toilet facilities such as a septic drain shall be used and sited on the camp site in a way that they do not cause water or other pollution			

Table 3.14: Final mine, exploration and supporting infrastructure rehabilitation, closure and aftercare.

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
24) Mining voids	Excavated trenches, pits, etc	• Refill pit alternately with waste and not saleable stockpiled blocks and smaller fragments of larger blocks. This systematic replacement can only be achieved if the different fractions are separated during excavations (design for closure principle) • Cover refilled rock waste with saved topsoil, complemented if necessary by scraping the area adjoining the pit on the condition that no vegetation is cleared for this operation	All rehabilitated areas should be monitored over a 4 year period from the onset of the rehabilitation procedures. The frequency of monitoring suggested is dependent on satisfactory performance. If however the requirements are not being met, the frequency	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
25) All waste and unwanted materials	Domestic and industrial waste	• Collect remaining domestic waste on site and transport it to a recognised disposal facility • Clean out the oil traps, collect the waste material in drums and transport to a recognised disposal facility • Manually remove all weedy species that are present at the site	Of monitoring can be increased. It is suggested that the monitoring be conducted once a year around January when the grasses are flowering. The rehabilitated areas can be monitored in two ways:		
26) All structures	Base camp constructions, workshop, processing plant, water tanks	• Upon cessation of all mining activities remove the workshop, surrounding fences, generators and any scrap material in the vicinity of the workshop • Seal all petrol, diesel, oil and grease containers and remove from the site to a recognised storage facility • Break up all concrete slabs and structures on site and transport the fragments to a suitable site for disposal or dump it in one of the pits. • Pending the approval by relevant authorities, the company may donate the remaining buildings, such as the workers quarters, office complex and the manager's house, to organizations aimed at uplifting the standards of the local communities	1. Sampling randomly located 1m^2 quadrats. Approximately 10 quadrats per hectare (or a minimum of 3) should be sampled per plant community. The factors that will be examined in each quadrate include: • Percentage basal cover • Percentage aerial cover • Species composition & diversity • Vigor and health of plants • Presence of and evidence of fauna • Nature of the substrate		

Table 3.14: *Cont.*

SIGNIFICANT ENVIRONMENTAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITIES FOR IMPLEMENTATION	RESOURCES REQUIRED FOR THE IMPLEMENTATION
27) Stormwater channel (Diversion of the natural flow)	Channel	• Replace the subsoil layer by backfilling the soil on top of the overburden and contour • Cap the subsoil with a topsoil layer about 10cm deep • Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake	To enable a comparison, control plots located within the surrounding unmined areas should also be monitored. Approximately 5 to 10 quadrats of $1m^2$ should be sampled per community type to set the controls.	(Proponent) Omusati Granite (Pty) Ltd (ECO, ER, PM, ENV)	Environmental Management Budget Line
28) All roads and substrate underlying the waste dumps, pipeline and areas covered by concrete	Vehicles and all (mining) infrastructure	• Rip the road surface/ substrate to a depth of at least 50 cm using a multi-toothed ripper and tractor or similar method • Disk the ripped surface to break up the clods • Cover with a layer of topsoil (if available) to a depth of about 10cm • Cap the topsoil containing the seedbank with a gravel layer by manually spreading the fragments across the surface using a rake	Photographic evidence at different rehabilitated places with a camera providing dates on the prints. Photographs should be taken every year around the same period at the same places and should be commented (visual observations)		

Table 3.15: Mine components to be addressed in the ongoing and final mine closure plan.

COMPONENTS	ASPECTS TO BE ADDRESSED
Open Pit Mine Area	○ Slope and bench stability ○ Groundwater and rainwater management ○ Security and unauthorized access ○ Wildlife entrapment ○ Effects of drainage into and from the pit
Ore Processing Facilities	○ Removal of buildings and foundations ○ Clean-up of workshops, fuel, and reagent ○ Disposal of scrap and waste materials ○ Re-profiling and revegetation of site
Waste Rock Piles	○ Slope stability ○ Effects of leaching and seepage on surface and groundwater ○ Dust generation ○ Visual impact ○ Special considerations for some types of mines such as uranium mines
Water Management Facilities	○ Restoration or removal of dams, reservoirs, settling ponds, culverts, pipelines, spillways or culverts which are no longer needed ○ Surface drainage of the site and discharge of drainage waters ○ Maintenance of water management facilities
Landfill / Waste Disposal Facilities	○ Disposal or removal from site of hazardous wastes ○ Disposal and stability of treatment sludge ○ Removal of sewage treatment plant ○ Prevention of groundwater contamination ○ Prevention of illegal dumping ○ Security and unauthorized access
Infrastructure	○ Removal of power and water supply ○ Removal of haul and access roads ○ Reuse of transportation and supply depots

4. ENVIRONMENTAL PERFORMANCE MONITORING

4.1 Overview

The environmental monitoring process of the EMP performances for the ongoing marble mining operations, ongoing exploration and supporting infrastructures activities is divided into two parts and these are:

(i) Monitoring activities and effects to be undertaken by the Environmental Control Officer (ECO), and.

(ii) Preparation of an Environmental Monitoring Report covering all activities related to the Environmental Management Plan throughout the life cycle of the ongoing mining and exploration operations to be undertaken by the Environmental Control Officer (ECO).

4.2 Ongoing Environmental Monitoring Programme

As part of the provisions of this EMP and the conditions of the Environmental Clearance Certificate (ECC) that will be issued by the Office of the Environmental Commissioner (OEC) in the Ministry of Environment, Forestry and Tourism, continuous environmental monitoring and reporting must be undertaken as required. The reporting process will form part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of this EMP performances assessments and will need to be compiled and submitted as determined by the regulator (OEC).

The process of undertaking appropriate monitoring as per specific topic and tracking performances against the objectives and documenting all environmental activities is part of internal and external auditing to be coordinated by the Environmental Control Officer (ECO) / External Consultant / Suitable qualified in-house resource person. Tables 4.1 – 4.9 outline the type of information that shall need to be recorded on a regular by the Environmental Control Officer (ECO) as part of the monitoring process of the activities and the effects.

4.3 Closure Environmental Monitoring Programme

The monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the ongoing mining operations to be undertaken by the Environmental Control Officer (ECO). The types of the data sets to be used in the preparation of such a report are outlined in Tables 4.1 - 4.9.

The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance for during the aftercare stage. The report shall outline the status of the environment and any likely environmental liability after completion of the mining operations. The report shall be submitted to the OEC in the Ministry of Environment, Forestry and Tourism.

Table 4.1: Monitoring of environmental performance implementation / environmental awareness training.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there an Environmental awareness training programme?					
How many people have been given environmental awareness training?					
Is a copy of the EMP on site?					
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? Ask 3 people at random various questions about the EMP.					

Table 4.2: Monitoring of environmental performance for the temporal and permanent structures.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are the temporal and permanent structures positioned to avoid sensitive zones, ephemeral river channels and potential sensitive sites?					
Has new infrastructure been created? If so, what, and how well planned / built with respect to environment?					
Have toilets and showers been provided? Where are they situated?					
Do receptacles for waste have scavenging animal proof lids?					
What litter is there – who is littering?					
Are there facilities for the disposal of oils / etc and how often is it removed to an approved disposal site?					
Is there evidence of oil / diesel spills? Bunding or not?					
What fuel source is being provided for cooking?					
Housekeeping					

Table 4.3: Environmental data collection.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are records being kept?					
Birds' mortality records as result of collision with the mine associated infrastructure?					
Birds nesting activities around the mine site?					
Noise level?					
Air Quality?					
Have archaeological sites been found / disturbed / described?					
Other key environmental data sets?					

Table 4.4: Health, Safety and Environment (HSE).

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there First Aid Kit containing anti-histamines etc?					
Are dangerous areas clearly marked off?					
Do vehicles appear to maintain the recommended speed limits?					
Do vehicles drive with headlights on along the gravel roads at all times?					

Table 4.5: Recruitment of labour.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
What labour source is used?					
How has the recruitment practice been done?					

Table 4.6: Management of the natural habitat and surficial materials management.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Has there been any development done on or very close sensitive areas?					
Has anyone been caught with plants or animals in their possession?					
Has there been wilful or malicious damage to the environment?					
Has topsoil / seed bank layer been removed from demarcated development areas and appropriately stored?					

Table 4.7: Tracks and off-road driving.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are existing tracks used and maintained?					
What new tracks have been developed and are they planned?					
What evidence is there of off-road driving? Who appears to be responsible?					
Are corners being cut, what type of turning circle are there? Three point turns vs. U turns?					
Have unnecessary tracks been rehabilitated and how well?					
Comments					

Table 4.8: Management of surface and groundwater.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
How is potable water supplied and how often? Position of tanks?					
Is water being wasted?					
Is there any leakage from pipes or taps?					
Were water samples taken regularly and measured?					

Table 4.9: Public relations.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Have any complaints been made about the mine construction and or operational activities by the different I&APs? If so, what, and how was the issue resolved?					

5. ENVIRONMENTAL AWARENESS

5.1 Company / Proponent Environmental Policy

Table 5.1 summarises the environmental statement with respect to environmental commitment that the Proponent, Omusati Granite (Pty) Ltd will implement as part of the company environmental policy.

Table 5.1: Environmental statement.

Omusati Granite (Pty) Ltd Environmental Statement
Omusati Granite (Pty) Ltd is Committed to: 1. Exercising appropriate environmental care in accordance with the provisions of the EMP as presented in Tables 3.1 - 3.15 from preconstruction to closure and aftercare stages. 2. Fully comply with all applicable environmental regulations in force in Namibia. 3. Delivery of significant socioeconomic benefits for through broad-based equity participation in the Project Development and Operation. 4. The promotion the development of open and constructive partnerships with the all the relevant stakeholders to address environmental concerns and advance necessary protection measures. 5. The advancement of scientific knowledge to be applied to the identification and effective resolution of environmental challenges associated with the ongoing mining operations. 6. Continuously encouraging Pollution Prevention (P2), Cleaner Production (CP), Waste Minimisation, Reuse and Recycling efforts, and. 7. Conducting regular internal and external audits of all our operations to ensure adherence to this policy and compliance to all relevant regulations throughout the life cycle of the ongoing mining operations.

5.2 Environmental Awareness Guidance

(i) The Environmental Rules apply to EVERYBODY. This includes all permanent, contract, or temporary workers as well as any other person who visits the mine site. Any person who visits the mine site will be required to adhere to the company Environmental Code of Conduct.

(ii) The Site Manager will issue warnings and will discipline ANY PERSON who breaks anyone of the Environmental Rules and Procedures. Repeated and continued breaking of the Rules and Procedures will result in a disciplinary hearing and which may result in that person being asked to leave the site permanently.

(iii) The ENVIRONMENT means the whole surroundings around us. The environment is made-up of the soil, water, air, plants and animals. and those characteristics of the soil, water, air, plant and animal life that influence human health and wellbeing, and.

(iv) If any member of the WORK FORCE does not understand, or does not know how to keep any of Environmental Rule or Procedure, that PERSON must seek advice from the

ENVIRONMENTAL CONTROL OFFICER (ECO), SITE MANAGER or CONTRACTOR. The PERSON that does not understand must keep asking until she/he is able to keep to the all the Environmental Rules and Procedures.

5.3 Environmental Awareness Training Materials

5.3.1 Natural Environmental Management Guidance

- Never feed, tease, or play with, hunt, kill, destroy, or set devices to trap any wild animal (including birds, reptiles, and mammals), livestock or pets. Do not bring any wild animal or pet to the mine site.
- Do not pick any plant or take any animal out of the mine site area EVER. You will be prosecuted and asked to leave the project area.
- Never leave rubbish and food scraps or bones where it will attract animals, birds or insects. Rubbish must be thrown into the correct rubbish bins or bags provided.
- Protect the surface material by not driving over it unnecessarily.
- Do not drive over, build upon, or camp on any sensitive habitats for plants and animals.
- Do not cut down any part of living trees / bushes for firewood, and.
- Do not destroy bird nest, dens, burrow pits, termite hills etc or any other natural objects in the area.

5.3.2 Vehicle Use and Access Guidance

- Never drive any vehicle without a valid licence for that particular vehicle and do not drive any vehicle that appears not to be road-worthy.
- Never drive any vehicle when under the influence of alcohol or drugs.
- DO NOT make any new roads without permission. Stay within demarcated areas.
- Avoid U-Turns and large turning circles. 3-point turns are encouraged. Do not ever drive on rocky slopes or vegetated dune areas.
- Stay on the road, do not make a second set of tracks and do not cut corners.
- DO NOT SPEED - keep to less than 60 km per hour on the tracks and site roads.
- No off-road driving is allowed.
- Vehicles may only drive on demarcated roads, and.
- Adhere to speed limits and drive with headlights switched on along any gravel road.

5.3.3 Air Emission and Dust Reduction

- Reduce speed for all trucks and vehicles on the mine and community roads to reduce dust emissions.
- Stock piles should be covered with dust biding chemical to reduce fugitive emissions.
- Chemical biding substance can be applied to road surfaces to supress dust particle and reduce emission within the mine which will reduce fugitive emissions in the community.

- ❖ Recycling water can be sprayed on roads, stockpiles and conveyors to suppress dust thus reducing dust emissions.

- ❖ Creating a buffer zone between the mine and the community – this can reduce noise and dust impact on the surrounding community by reducing the distance.

- ❖ Planting of trees in the buffer zones - this can further help to minimise the visual impact of mining operations on local communities. This also reduces the levels of noise and dust, and.

- ❖ Continuous weather monitoring on site and purchasing of quiet trucks and excavators and customised trucks with rubber matting to dampen sounds when they are being loaded.

5.3.4 Noise and Vibrations Emission Reduction

- ❖ Speed reduction can reduce noise associated with vehicles and trucks movements and ensure that vehicles are services regularly.

- ❖ Management to consider purchasing machineries that emit low levels of noise and ensure up-to-date maintenance of all equipment to reduce emission of noise from such machines.

- ❖ Careful selection of equipment and insulation and sound enclosures around machinery can control noise.

- ❖ Development of environmental noise management plan to keep any disturbance of the community to minimum levels – this can be done through: mine planning. plant and equipment design and selection. housing crushing and processing plant within buildings. enclosing conveyor systems. using terrain to acoustically shield the operations and operational procedures like speed limits on roads around site which minimise dust emissions from trucks.

- ❖ Regular and extensive monitoring of noise impact associated with blasting as well as other mining operations.

- ❖ Restrictions of blasting time to midday can reduce the impact of noise and vibration, and.

- ❖ Designing detonation sequence with delays between holes so that blast waves from individual holes do not occur simultaneously at a neighbouring home or property.

5.3.5 Health and Safety Guidance

- ❖ Drink lots of water every day, but only from the fresh water supplies.

- ❖ Take the necessary precautions to avoid contracting the HIV/AIDS virus.

- ❖ Only enter or exit the mine at the demarcated gates / or road.

- ❖ Always keep the access area as you found them.

- ❖ Any damage to any existing infrastructure in the area must be report to the Environmental Control Officer / Project Manager who will then inform the owner of any damage with all the repairs done to the satisfaction of the owner or Environmental Control Officer.

- ❖ Never enter any area that is out of bounds, or demarcated as dangerous or wander off without informing or permission of team leader.

- ❖ Report to your Contractor or the Site Manager if you see a stranger or unauthorised person

in the mine site.

- ❖ Do not remove any vehicle, machinery, equipment, or any other object from the mine site without permission of your Contractor or the Site Manager.

- ❖ Wear protective clothing and equipment required and according to instructions from your Contractor or the Site Manager, and.

- ❖ Never enter or work in the mine when under the influence of alcohol or drugs.

5.3.6 Preventing Pollution and Dangerous Working Conditions Guidance

- ❖ Never throw any hazardous substance such as fuel, oil, solvents, etc. into streams or onto the ground.

- ❖ Never allow any hazardous substance to soak into the soil.

- ❖ Immediately tell your Contractor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled anywhere in the mine.

- ❖ Report to your Contractor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak, or drip.

- ❖ Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities.

- ❖ Vehicles, equipment and machinery, containers and other surfaces shall be washed at areas designated by the Contractor or Environmental Control Officer/ Site Manager, and.

- ❖ If you are not sure how to transport, use, store or dispose any hazardous substance - ASK your Contractor or Environmental Control Officer / Site Manager for advice.

5.3.7 Saving Water Guidance

- ❖ Always use as little water as possible. Reduce, reuse and re-cycle water where possible.

- ❖ Report any dripping or leaking taps and pipes to your Contractor or Environmental Control Officer or Site Manager, and.

- ❖ Never leave taps running. Close taps after you have finished using them.

5.3.8 Disposal of Waste Guidance

- ❖ Learn to know the difference between the two main types of waste, namely:

    - o General Waste, and.

    - o Hazardous Waste.

- ❖ Learn how to identify the containers, bins, drums, or bags for the different types of wastes. Never dispose of hazardous waste in the bins or skips intended for general waste or construction rubble.

- ❖ Never burn or bury any waste within mining license area.

- ❖ Never overfill any waste container, drum, bin, or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins, or skips are nearly full.

- ❖ Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping, and.

- ❖ Littering is prohibited.

5.3.9 Religious, Cultural, Historical and Archaeological Objects Guidance

- ❖ If you find any suspected religious, cultural, historical or archeologically object or site around the mine, you must immediately notify your Contractor or Environmental Control Officer **/** Site Manager, and.

- ❖ Never remove, destroy, interfere with or disturb any religious, cultural, historical or archaeological object or site around the mine site.

5.3.10 Dealing with Environmental Complaints Guidance

- ❖ If you have any complaint about dangerous working conditions or potential pollution to the environment, immediately report this to your Contractor or the Environmental Control Officer **/** Site Manager, and.

- ❖ If any person complains to you about noise, lights, littering, pollution, or any other harmful or dangerous condition, immediately report this to your Contractor or the Environmental Control Officer / the Site Manager.

5.4 Environmental Personnel Register

Table 5.2 shows the Environmental Personnel Register to be signed by every person who receives or attends the Environmental Awareness Training or who has the training material explained to him or her or in possession of the training material.

Table 5.2: Environmental personnel register.

Date	Name	Company	Signature

6. CONCLUSION AND RECOMMENDATIONS

6.1 Summary of Conclusions

Mitigation measures for both positive and negative impacts have been proposed and management strategies are provided in this updated Environmental Management Plan (EMP) for the following development stages:

(i) Preconstruction.

(ii) Construction.

(iii) Operation, ongoing exploration, monitoring and rehabilitation, and.

(iv) Decommissioning, closure and aftercare.

Based on the extent, duration, intensity and likely negative and positive impacts of the ongoing mining operations, this Environmental Management Plan (EMP) Report incorporating all the relevant mitigation measures with respect to likely impacts and recommendations to be implemented by the developer / operator. This EMP implementation and monitoring activities covers all the stages of the ongoing mining operations project life cycle and is inclusive of the operation and ongoing rehabilitation and closure, final rehabilitation and aftercare stages.

6.2 Recommendations

It is hereby recommended that the Omusati Granite (Pty) Ltd takes all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the ongoing mining operations. The following are the recommended actions to be implemented by the proponent (Omusati Granite (Pty) Ltd) as a part of the management of the impacts through implementations of this updated EMP Report:

(i) Contract an Environmental Control Officer / External Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the ongoing mining operations.

(ii) Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle.

(iii) Develop a simplified environmental induction and awareness programme for all the workforce, contractors and subcontractors.

(iv) Where contracted service providers are likely to cause environmental impacts, these will need to identified and contract agreements need to be developed with costing provisions for environmental liabilities.

(v) Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report to be prepared by the Environmental Control Officer / External Consultant / suitable in-house resource person and to be submitted to the regulators and to end the ongoing mining operations, and.

(vi) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA related to the expansion of the current delineated resources or development of completely new mine site within the EPL area.

All the responsibilities to ensure that the recommendations are executed accordingly, rest with the proponent (Omusati Granite (Pty) Ltd). The proponent must provide all appropriate resource requirements for the implementation of this Updated EMP as well as an independently managed (not directly controlled by the mining company) funding instrument for mine Closure and Aftercare environmental liabilities.

It is the responsibility of the proponent to make sure that all members of the workforce including contractors and subcontractors are aware of this EMP provisions and its objectives.

It is hereby recommended that the proponent take all the necessary steps to implement all the recommendations of this EMP for the successful execution of the preconstruction, construction, operational, decommissioning, closure and aftercare activities of the ongoing marble mining operations, ongoing exploration and supporting infrastructures activities.

END OF THE EMP