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Environmental Overview and Environmental Management + Rehabilitation Plan (EMRP) Report for:

RENEWAL AND TRANSFER of Environmental Clearance Certificate for the continuation of operations of the Existing Marmorwerke Karibib Stone Processing Factory and Reclamation/ Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands, Karibib Constituency, Erongo Region

MEFT APPLICATION NO.:	**APP-003444**
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LIST OF ABBREVIATIONS

DEAF	Department of Environmental Affairs and Forestry
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMRP	Environmental Management & Rehabilitation Plan
EMA	Environmental Management Act
ECC	Environmental Clearance Certificate
I&APs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Water & Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MLIEC	Ministry of Labour, Industrial Relations and Employment Creation
MME	Ministry of Mines and Energy
MWT:	Ministry of Works and Transport
SWM	Solid Waste Management
TC	Town Council

1 INTRODUCTION

Marmorwerke Karibib (Pty) Ltd (herein referred to as Marmorwerke KR), intends to extend the scope of activities covered under the current Environmental Clearance Certificate (ECC) and simultaneously apply for renewal of the ECC for environmental clearance to continue operating its Karibib based dimension stone processing facility. The item to be added to be to the current scope of the ECC is the fencing off, reshaping and temporary reclamation/ rehabilitation of an abandoned borrow pit which is located on the northern outskirts of the Karibib Townlands. It is proposed that the abandoned borrow pit will be simultaneously reclaimed and rehabilitated by backfilling with a combination of natural soil and marble dust/ slightly moist sludge until the pit has filled to natural ground elevation. In addition, the new scope of the operation with include the widening of an existing access gravel road connecting the processing facility to the abandoned borrow pit.

According to the Environmental Management Act (EMA) No. 7 of 2007 and its Environmental Impact Assessment (EIA) Regulations of 2012, the proposed activities are listed activities under the below stated provisions of the EMA and may not be undertaken without an Environmental Clearance Certificate (ECC). The provisions under which the proposed activities are covered in the EMA are as follows:

- **Activity 2.1:** *WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES – The construction of facilities for waste sites and disposal of waste*
- **Activity 2.3:** *WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES – The import, processing, use and recycling, temporary storage, transit or export of waste*
- **Activity 3.1:** *MINING AND QUARRYING ACTIVITIES - The construction of facilities for any process or activities which requires a license, right or other form of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- **Activity 3.2:** *MINING AND QUARRYING ACTIVITIES - Other forms of mining or extraction of any natural resource whether regulated by law or not.*
- **Activity 3.3:** *MINING AND QUARRYING ACTIVITIES - Resource extraction, manipulation, conservation, and related activities.*

Omavi Geotechnical and Geo-environmental Consultants cc (herein referred to as OMAVI) was appointed to conduct an Environmental Overview Assessment (EA) as per the above-mentioned Act and its Regulations, and draft a pragmatic Environmental Management and Rehabilitation Plan for the existing and operational dimension stone processing facility, the abandoned borrow pit which is to be reclaimed and rehabilitated, and the access road linking the two sites. The assessment aims to document baseline environmental conditions, consider alternatives to the ongoing/ proposed activities, identify and systematically assessment potential environmental impacts, and formulate feasible impact management measures.

In identifying and assessing the risk levels of the various potential impacts, and formulating suitable management measures, due consideration was given to all stages of the project's value chain and life cycle. The accompanying Environmental Management and Rehabilitation Plan (EMRP) provides recommended mitigation, enhancement and monitoring measures to minimize and/ or mange the significance of all significant impacts, where complete avoidance is not possible. Collectively, this document together with the EMRP will support the Proponent's renewal application for environmental clearance from the Ministry of Environment, Forestry and Torusim (MEFT) and the Ministry of Mines and Energy (MME) to permit the planned activities. This report will further assist the the Ministry of Environment, Forestry and Tourism's (MEFT) Department of Environmental Affairs (DEA) in making an informed, knowledge-based decision on the issuance of the Environmental Clearance Certificate (ECC) for the proposed activities.

1.1 Objectives of this Report

The objectives of this project can be summarised as follows:

- To provide a background overview documentation of the current conditions of the existing infrastructure at the processing facility, at the abandoned borrow pit, and in the general town of Karibib;
- To document the transparent mechanisms that were adopted to ensure that Interested and affected parties are informed about the project activities, and are availed an adequate opportunity to express their views, comments and inputs;
- To document current (baseline) bio-physical, socio-economic, geotechnical, geochemical, hydrological, land-use, and ground quality conditions in the vicinity of the existing processing facility, the abandoned borrow pit and the proposed waste haulage access road;
- To document the scope of activities:
    - that are covered under the current Environmental Clearance Certificate (ECC),

    - that are being proposed as additions to the current scope of activities for the ECC renewal
- To document the current environmental impacts as well as those that could be triggered by the new activities;
- To amend the existing EMP so that it is reflective of both current and future conditions that could arise from the proposed additional activities;
- To amend the existing EMP to include waste management guidelines that are specific to the project; and
- To motivate for amendment, ownership transfer and renewal of the ECC.

1.2 Project Need and Desirability

The annual production of dimension stone and demand for decorative/ aesthetic final products from marble and granite dimension stone processing have generally seen an increase over the past 5 to 6 years in international markets such as the USA, China, Europe and India. For this reason, in around 2017/ 2018 Marmorwerke Karibib (Pty) ltd saw an opportunity to revive and revamp the previous Karibib Stone Works facility on Erfs 222 and 588, in the town of Karibib, by modernizing the cutting, polishing, general beneficiation processes and packaging streams at the facility. This was augmented by a strong desire to invest in the country's dimension stone quarrying and beneficiation industry after seeing exponential growth of a similar facility in Walvis Bay. The Marmorwerke Karibib dimension stone processing facility is currently the second largest facility of its nature in Namibia, and currently employs about 190 people, most of who are Namibian and residents of Karibib.

The need to ensure that the existing facility and the proposed controlled reclamation and rehabilitation of the concerned abandoned borrow pit with marble/ granite dust and slightly moist sludge, continue to operate and are implemented, respectively, are justified by the following reasons:

- The project will ensure medium to long term employment opportunities at the stone processing facility and at the source quarries for the youth in various areas of the Erongo Region.
- The continuation of operations will contribute towards a consistent and reliable supply of quality dimension stone products locally for the construction and aesthetics sectors.
- The operation of the stone processing facility will continue to provide business opportunities to SMEs through procurements opportunities such as:
    - Haulage contracts for blocks, final products and possibly marble/ granite dust
    - Waste collection
    - Waste recycling and reuse

  - Consulting services to meet local permitting requirements
  - Security services
- The widening of the proposed access road linking the factory to the borrow pit, as well as the reshaping and fencing of the borrow pit to permit safe an controlled disposal of marble/ granite dust and slightly moist sludge will create employment and procurement opportunities for locals
- Revenue to the Karibib Town council, parastatals such as Nampower and Namwater, and the Namibian government at large will continue to be realised through payment of rates and taxes, water and electricity, and various forms of taxes
- The backfilling of the open borrow pit will help to reclaim and rehabilitate the site, while curbing hazards that would arise from having an open borrow pit. Such hazards include flooding and risks of drowning, uncontrolled and illegal dumping of waste, etc
- The reclamation of the borrow pit and the regular removal of marbe/ granite dust from the stone processing facility's site will minimize visual impacts on the landscape.
- The planned regular removal of marble/ granite dust from site will contribute towards minimizing risk of excess dust generation within the town.

1.3 Project Location

The Marmorwerke Karibib stone processing factory is located in the town of Karibib on the western boundary of the town and along the B2 national highway enroute the town of Usakos and Walvis Bay. The site is enclosed in a 4 m high perimeter wall. The abandoned borrow pit, which is to be reclaimed with marble/ granite dust/ slightly moist sludge, is located about 1.5 km to the north of the town's CBD, along an existing gravel road leading to the town's oxidation ponds and the Karibib Military base. Therefore the project area lies in the Karibib Constituency, Erongo Region, Namibia. A locality map of the project sites is shown in **Figure 1-1**.

The coordinates of the two sites concerned are provided in **Table 1-1**.

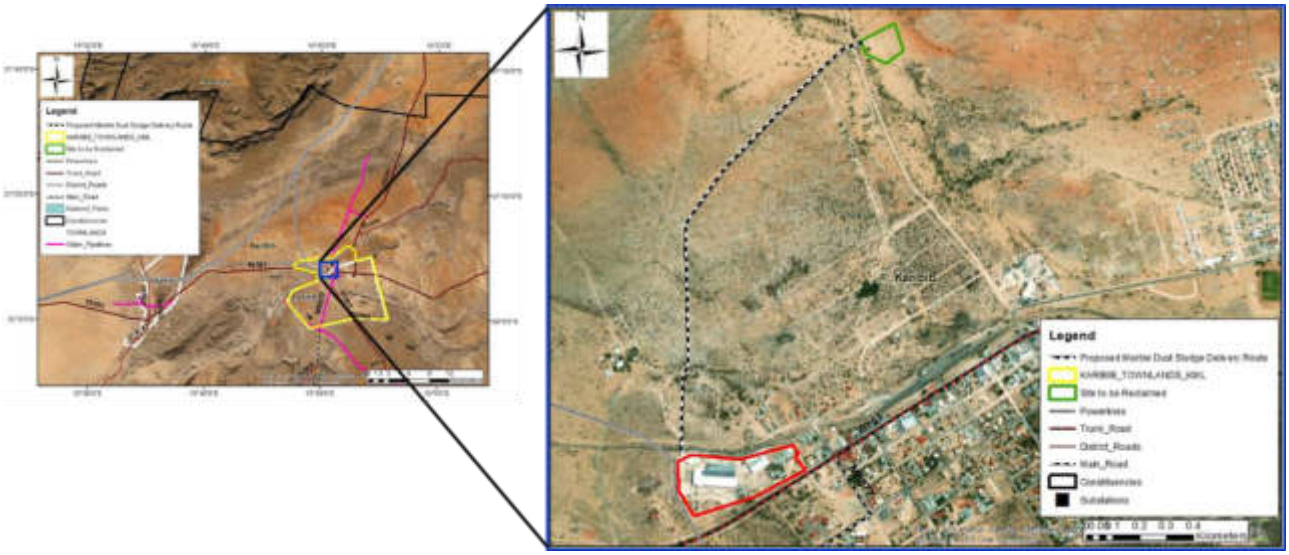


Figure 1-1. Location of the Marmorwerke Karibib Stone Processing Facility and the abandoned borrow pit proposed for the temporary disposal of marble/ granite dust.

Table 1-1. Approximate corner coordinates of the project sites

STONE PROCESSING FACILITY CORNER COORDINATES:
• 21.941266°°S/ 15.844250°E • 21.940297°S/ 15.843638°E • 21.938976°S/ 15.843597°E • 21.938793°S/ 15.844106°E • 21.938934°S/ 15.845946°E • 21.938314°S/ 15.847856°E • 21.939281°S/ 15.848522°E • 21.940484°S/ 15.846537°E • 21.940691°S/ 15.845578°E
ABANDONED BORROW PIT CORNER COORDINATES
• 21.925660°S/ 15.851236°E • 21.925335°S/ 15.850506°E • 21.924885°S/ 15.850297°E • 21.924312°S/ 15.851516°E • 21.925213°S/ 15.851856°E

1.4 The Proponent

The Stone processing facility is currently owned and operated by Marmorwerke Karibib (Pty) Ltd. Conversely, the abandoned borrow pit is presently a public open space within the Karibib Townlands and is therefore under the custodianship of the Karibib Town Council. One of the scope amendments to the current operations is to reshape the pit and temporarily fence it off to enable safe and controlled reclamation by means of backfilling with a combination of marble/ granite stone offcuts, marble/ granite dust and natural soils from the surrounds. As a result, this is expected to put the abandoned borrow pit under the management and care of Marmorwerke Karibib who will then be expected to report regularly on the state of operations and affairs pertaining to this site to the Karibib Town Council.

1.5 The Environmental Consultant

Omavi Geo-technical and Geo-environmental consultants (hereinafter referred to as OMAVI) has been appointed by the proponent to act on their behalf as an independent environmental consultant to carry out an Environmental Overview, update the current Environmental Management Plan (EMP) and submit these documents to the Department of Environment Affairs and Forestry (DEAF) as part of the application for the renewal of the Environmental Clearance Certificate (ECC).

The Environmental Overview and the drafting of the Environmental Management & Rehabilitation Plan (EMRP) were conducted by a qualified and experienced environmental assessment practitioner, whose detailed curriculum Vitae (CV's) is provided in **Appendix B** of this document.

1.6 The Environmental Overview Process

The process followed in conducting this environmental overview assessment can be summarized as follows:

1. Project screening process – This entailed the following activities:
    a. An exchange of project kick-off emails between the EAP and the management of Marmorwerke Karibib to establish the project scope and needs of the project proponent;
    b. Preparation of the Background Information Document (BID) and compilation of the ECC Application, Amendment and Ownership Transfer forms, and their subsequent submission to the Office of the Mining Commissioner in the Ministry of Mines and Energy (MME) (Competent Authorities) for notification and recommendations. The date stamped copy of the ECC Application, Amendment and Transfer from the MME were uploaded to the MEFT's EIA online portal for registration (**Application number 003444)** and notification of the commencement of the EA process.

2. Invitation of key stakeholders (i.e., I&APs) and the public to participate in the environmental assessment process by submitting written inputs and/ or participating in the public consultation meeting which took place on 29th January 2022 in Karibib. Notifications and invitations to I&APs in this regard was issued through advertisements in 3 local newspapers, direct emails communications to pre-identified and registered stakeholders and authoritative institutions, and placement of printed public notices at strategic locations in Karibib and Swakopmund.
3. Field assessment of all 3 sites (i.e., the existing stone processing facility, the waste haulage gravel road, and the abandoned borrow pit) concerned to establish baseline conditions and current practices in so far as the following aspects are concerned:
    a. The production value chain activities (both current and those proposed)
    b. Socio-economic profile of the town
    c. Demographic profile of current workforce
    d. Current waste management practices
    e. Current environmental challenges and concerns
    f. The bio-physical environment
    g. Geotechnical, land-use, drainage conditions of the abandoned borrow pit and the proposed access gravel road
4. Consolidation of the above into an Environmental Overview Summary report, which served as a baseline document of the pertinent issues to be addressed in the Environmental Management and Rehabilitation Plan (EMRP).
5. Updating of the current Environmental Management Pan (EMP) to reflect current practices as well as to incorporate future/ proposed activities and regulatory requirements. Because the previous Environmental Scoping Assessment and EMP reports did not adequately address the issue of waste management associated with the operation of the facility, a strong emphasis was placed on this aspect in the updated EMRP.
6. Submission of the Environmental Overview Summary Report and the EMRP report, including all appendices to the Department of Environmental Affairs and Forestry in fulfilment of the requirements of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) for application, amendment and ownership transfer of the Environmental Clearance Certificate (ECC).
7. Notification of all registered Interested and Affected Parties (I&APs) confirming submission of the final reports to MEFT's EIA online portal for public review and comments.

2 PROJECT DESCRIPTION, ACTIVITIES AND PROCESSES

General Background

Quarrying and beneficiation of dimension stone has seen fast growth in the last 5 to 10 years in Namibia and globally. This is primarily owing to growth of the construction industry in Asia, the USA and India. Namibia, specifically, has witnessed a steady increase and substatial growth in the dimension stone industry due to the occurence of vast reserves of exposed and shallow-sitting dimension stone quality marbles and granite rocks in the Erongo Region; which makes the extraction of this low value commodity profitable. For the area of Karibib, this growth trajectory motivated the complete revamping and modernization of the then Karibib Stone Works facility between 2016 and 2018 to help boost efficiency and production capacity of this dimension stone processing facility while enabling the facility to effectively absorb high quantities of dimension stone blocks typically brought in from nearby quarries in the vicinity of Karibib.

To ensure that all revamping, construction and operational activities of the then Karibib Stone Works facility comply with the Environmental Management Act of 2007, the new owner and operator of the facility, Marmorwerke Karibib (Pty) Ltd, also applied for an ECC at the DEAF which was successfully granted in April 2019. However, the ECC was wrongly granted to Best Cheer Investments Namibia which is rather a sister company to Marmorwerke. A motivation letter providing merit for the ECC ownership change is attached in **Appendix A**.

Despite this growth, this industry faces several significant challenges, including low efficiency levels, high production costs due to long haulage distances from the source quarries, the generation and safe management of significant volumes of various wastes, high electricity and water demand, and resource loss during extraction and processing phases. Based on approximate figures provided by the project proponent, about 51% of all material extracted from dimension stone quarries typically turns into waste (mainly as waste rock and to a limited extent as sludge/ dust) during the extraction operation, and roughly 41% of the material that arrives at dimension stone processing facilities end up as waste (primarily as stone breakoffs/ cutoffs, and sludge or dust) during the processing operation. Therefore, the typical overall percentage recovery of the dimension stone production process is only approximately 29%, signifying the significant volumes of resources lost and the large amounts of waste of natural stone waste generated. This waste is typically in addition to other forms of waste such as used oils and grease, scrap metals, waste wood, office/ domestic waste or litter, and sewer. The Marmorwerke Karibib facility is no exemption to these challenges and as a matter of fact it is particularly challenged when it comes to the management of sludge and dust because of the confined space it operates in and the fact that it is in town, and in proximity to residence

and offices. The challenges posed by various forms of waste at this Karibib facility are highlighted in this report, and pragmatic mitigation measures are well articulated under the Environmental Management and Rehabilitation Planning section.

A full description of the scope of activities covered under the current ECC as well as the proposed project activities is provided in the subsections below.

Scope of Activities and Practices **covered under the Current** ECC

Considering the project site map displayed in Figure 1-1, the activities covered under the current ECC are spatially confined to the red polygon, i.e., the existing stone processing facility, and may be summarised as follows:

- Delivery of 6 to 12 m^3 blocks to the processing facility
- Gang sawing of blocks into slabs
- Cutting of slabs to desired sizes and shapes using various forms single blade cutters
- Smoothening, polishing, and trimming of surfaces and edges plus addition of web-mesh for additional product durability
- Packaging and warehousing of final products and slab offcuts/ breakoffs
- Loading of packaged final products and stone breakoffs to markets (both local and overseas via the Walvis Bay Port)
- Removal of marble/ granite slurry from the water recovery/ recycling dams, followed by on site stockpiling and subsequent spreading of the sludge and/ or dust within the stone processing premises
- During the block and/or slab cutting, trimming and smoothening processes water is continuously sprinkled onto the cutting, trimming machines for cooling, lubrication and dust suppression purposes. This slurry containing water is collected via an existing network of concrete lined drainage trenches installed throughout the processing facility which drain towards a centralized trench that delivers all the water to concrete-lined water recovery/ recycling dams. In these dams the water flows in a zig-zag pattern through several dams, and as that happens sedimentation of the suspended marble/ granite fine particles occurs. The relatively clear water is pumped back into the processing plant for reuse.

Each of these activities involves certain material inputs and outputs, and is associated with some adverse and positive impacts.

Table 2-1 below summarises the activities, input and outputs involved at each stage, and has been tailored to reflect the situation at the Marmorwerke Karibib stone processing facility.

Table 2-1. Summary of current project activities with their respective inputs and outputs

ACTIVITY - DESCRIPTION	INPUTS	OUTPUTS	Major Current/ Potential Impact(s) of Concern	Current/ potential benefits
Hauling of blocks to and subsequent offloading and stockpiling of blocks on processing facility premised	- Interlink trucks, front-end loaders - Designated block stockpiling bay - Good access, district & national roads from source quarries	- Block stockpiles at designated bay	- Overloading of trucks & possible damage to roads - Safety & health risks from moving trucks & heavy equipment - Hydrocarbon spillages & soil contamination - Dust generation, especially where trucks& heavy vehicles drive over dry marble/ granite dust - Possible injuries/ fatalities and damage to equipment arising from block lifting operations	- Block haulage is conducted by SME contractors. This provides sustainable business opportunity to SMEs, which in turn provides additional employment opportunity

Loading blocks onto different gang sawing stations and subsequent gang sawing of blocks into slabs	- 6 to 12 m^3 sized marble/ granite rectangular & square blocks - Multiple stations of gang-saws - Electricity to power cutting machinery - The water requirement is fulfilled through a network system of water supply pipelines that is directly connected to the municipality's fresh water supply system.	- Slabs & stone break-offs from the block cutting process - Wet marble/ granite sludge or dust generated during the cutting process. Such wet dust remains suspended in the process water and drains to sedimentation concrete lined dams. Due to sedimentation the dust (solid) settles down and the transparent supernatant water is pumped back for reuse to sprinkle the blocks.. Thus, about 20 - 25 % of the marble block processed results into	- Safety risks from regular and continuous lifting of blocks and slabs, & cutting operations - Noise pollution within the processing plant - Wet slippery surfaces and risk of tripping - Water pollution due to suspension of fine solids from the cutting process - It is anticipated that daily water loss due to pumping of wet slurry and stockpiling it is in the range of about 1000-1500 litres. This is significant considering the water scarce nature of the Karibib area.	- Employment opportunities for youth of Karibib & surrounding areas - Water is continuously recycled, although there is some water loss during the pumping & drying of wet slurry

	- Continuous sprinkling of water onto blocks for lubrication, cooling & dust suppression	marble slurry while about 5 – 10% is of stone break-offs (from brken edges & slabs). The marble slurry has nearly 35 - 45% water content. 5-7% of processed marble block turns into polishing waste on grinding & polishing of the block. Current practice at the facility involves pumping the settled semi-solid slurry from the concrete lined dams into stockpile heaps which are usually left to dry out for a while before being spread across the site with a front-end loader.	- High power & energy demand from the continuously running cutters	

	- This EMRP recommends that going forward wet slurry must first be pumped from the sedimentation dams onto a gently sloping concrete lined pad (fitted with cross cutting vertical fine filter nets) to facilitate water drainage to a lower point from where it can be pumped back into the process for reuse. As an alternative technology which might be more costly from an operational perspective the pumped wet slurry may go via a filter press system before			

	being deposited onto the concrete lined pad in order to maximize water recovery. The relatively dry/ slight moist slurry shall then be scooped up onto tipper trucks for trucking to the proposed marble/ granite waste dump site.			
Cutting of slabs to desired sizes and shapes using various forms single blade cutters	- irregularly shaped slabs - Electricity to power cutting machinery - Continuous water sprinkling for lubrication, cooling & dust suppression	- 20, 25 and 30 mm thickness tops - tiling tops - wet marble/ granite sludge suspended in process water - stone break-offs and off-cuts	- Water pollution - generation of waste in the form of slurry sludge, dust and stone break-offs - Noise pollution within the vicinity of the plant. Noise can compromise community relationships	- Employment opportunities for youth of Karibib & surrounding areas - Employment enhances community relationships

			- Safety risks from cutting operations - Wet slippery surfaces and risk of tripping	
Smoothening, polishing, and trimming of surfaces and edges plus addition of web-mesh for additional product durability	- resin - table tops, tiling tops, cladding slabs - Electricity to power polishing , trimming and web-meshing machines - web-mesh	- polished, sized and trimmed final market ready products (tiles, table tops, cladding stone) - stone break-offs and off-cuts - waste web mesh and resin	- risk of water pollution from resin - generation of waste web-mesh - Safety risk from polishing & trimming operations - generation of waste mainly in the form of stone break-offs, web-mesh, waste resin	- Employment opportunities for youth of Karibib & surrounding areas - Web-meshing ensures durability of final products
	- Wood for manufacturing packaging pallets	- Packaged (sealed and packaged on pallets) final products	- Safety risks from final products and packaged break-offs lifting operations	- Employment opportunities for youth of Karibib & surrounding areas

Packaging and warehousing of final products and slab offcuts/ breakoffs	- Plastic & wrapping tape for packaging final products - 1 ton polyester bags for packaging stone break-offs/ off-cuts - forklift - Concrete lined warehousing space - Product loading bay - Diesel to power forklift	- Stone break-offs/ off-cuts packaged in 1 ton polyester bags	- Hydrocarbon spillages from forklifts and loading trucks - Waste wood, plastic & polyester bags from manufacturing of pallets and packaging operations - Noise pollution	
Loading & transportation of packaged final products and stone breakoffs to markets	- Interlink flat deck trucks & forklifts - Diesel to power trucks/ forklifts'	-	- Dust generation from vehicles driving on access roads on the stone processing premises - Noise pollution from trucks	- Transportation of final products to port of Walvis Bay is carried out by contractors - Shipping of products to overseas markets generates foreign currency

	- Loading bays & access road from B2 tarred road to warehouse loading bay		- Possible damage to national and district roads due to truck overloading - Safety hazards arising from lifting operations & moving heavy vehicles	- Generation of revenue for Namport through port handling fees - Revenue from Export taxes
Removal of marble/ granite slurry from the water recovery/ recycling dams, followed by on site stockpiling and subsequent spreading of the sludge and/ or dust within the stone processing premises	- Excavator, tipper truck & bull dozer - Marble/ granite sludge - Space for stockpiling & drying the wet sludge	- Marble/ granite sludge and dust stockpiles and heaps	- Dust generation from spreading & levelling of marble/ granite heaps/ stockpiles - noise pollution from earth moving machinery - Possible hydrocarbon spillages & soil contamination - Safety hazards from moving heavy vehicles & excess dust on site	- The process facilitates optimal water recovery & re-use - The process is purely a physical one as no chemicals are added to the process

Process water recovery & recycling	- Concrete water drainage trenches & water collection/ recovery dams - Pumps & pipe network for pumping recovered/ recycled water back to plant - Electricity to power pumps	- Relatively clear water for re-use in processing plant - Marble/ granite sludge	- High electricity consumption due to pumping - Stockpiling & drying of granite/ marble sludge results in solid waste generation	- Water reuse and reduction in portal water intake
Generation of various other forms of waste in the form of, in addition to marble/ granite dust & sludge: - office/ domestic litter - Used oils, grease, other lubricants - Scrap metals - Waste wood - Waste plastic & polyester - Waste resin & web mesh - Construction rubble - Used tyres, batteries & empty containers	- Office & domestic supplies - Diesel & grease from servicing/ maintenance of machinery - Mechanical workshops	- Various forms of waste as listed in column 1	- Adverse visual impacts from temporary storge of various wastes on site. This reflects badly on business - Risk of soil contamination from spillage of used hydrocarbons & resin	- Waste oils, lubricants, batteries, empty containers & scrap metals are collected by local off taker contractors. This provides a sustained business opportunity for such contractors

	- Scrap metals from replacement of vehicle & various parts in the processing facility - Waste wood, plastic & polyester from product packaging activities - Waste resin & web-mesh from polishing & meshing activities - Used grease, resin & web mesh containers - Mechanical workshops for maintenance purposes - Civil renovations & maintenance works		- Risk to health of birds, reptiles & other micro-organisms from possible consumption of unsealed rein, hydrocarbons	- Domestic/ office litter & waste wood is collected weekly by municipality & disposed off at the current municipal waste dump site - Construction rubble is sometimes used on site to fill up depressions & do landscaping. - Offtake opportunities for various wastes strengthens community relationships

Scope of **Additional** Activities and Practices proposed for the **new** ECC

Going forward Marmorwerke Karibib proposes to incorporate the activities summarised in **Table 2-2** in its day-to-day operations, and would therefore like to have these activities registered as part of the scope of activities covered under the new ECC.

Table 2-2. Summary of *additional* operational and maintenance activities to be covered under the new ECC

ACTIVITY - DESCRIPTION	INPUTS	OUTPUTS	Major Current/ Potential Impact(s) of Concern	Current/ potential benefits
Construction of a concrete lined sloping pad behind the main processing facility for temporary drainage & drying of marble/ granite sludge prior to trucking to the abandoned borrow pit	- Excavators, grader, roller compactor & tipper trucks - Skilled & unskilled labour workforce - Concrete products (aggregates, sand, cement)	- A gently sloping large concrete lined pad. Wet sludge will be temporarily deposited on the sloping portion for drainage & drying before trucking it off for permanent disposal. Water draining from the sludge will collect in the lower levelled portion of the pad, from where it will be pumped back into the plant for reuse	- Generation of construction waste or rubble, dust and noise in the vicinity of the stone processing site. Visual & dust impacts from these activities will likely be low because of the 4 m high perimeter wall	- The new concrete lined sloping pad will facilitate more water recovery & reuse - Drying of granite/ marble sludge to a slightly moist state will minimize dust generation during haulage to & disposal at the borrow pit. Drying will further prevent disposal of process water at the pit

Widening of existing gravel road between the stone processing facility & the abandoned borrow pit to facilitate haulage of marble/ granite sludge & stone break-offs to pit	- Graders, water bowsers & tipper trucks - Skilled & unskilled labour workforce	- A widened access road with safety berms & safety sign boards	- Typical gravel road associated risks such as dust, noise & fly stones due to regular movement of trucks - Risk of collisions between vehicles, vehicles & domestic animals, & between vehicles & humans - The gravel road will cross the railway. Hence, there is risk of collisions between trains & trucks	- The road will facilitate efficient & distracted haulage of marble/ granite sludge & stone break-offs to the pit - Since this road is on the outskirts of town it will pose minimal risk to residents in terms of noise & dust pollution

Reshaping, temporary fencing & general earthworks preparation of the abandoned borrow pit to enable disposal of marble/ granite sludge & stone break-offs	- Graders, front-end loaders, excavators, water bowsers & tipper trucks - Skilled & unskilled labour workforce - Fencing & controlled entry authorization material	- A reshaped, levelled & fenced off borrow pit site ready for disposal of the marble/ granite waste - The fence shall be fitted with "no unauthorized entry signs" & a gate man	- Dust & noise pollution during reshaping earthworks - Possible temporary interruptions on the usage of the district road - Possible slight diversion of drainage channel adjacent to the borrow pit - Risk of flooding of the site during the rainy season may interrupt sludge/ dust/ break-offs disposal schedule	- Improved community relations between the Karibib Town Council & its residents because risk of drowning at the abandoned borrow pit would be eliminated once the site has been fenced off - Reshaping & levelling of borrow pit will create additional storage capacity at the borrow pit site which in turn would ensure there is sufficient storage capacity for marble/ granite sludge & stone break-offs disposal
	- Tipper trucks, front-end loaders	- offsite disposal of marble/ granite break-offs & sludge/ dust	- Dust & noise generation from regular movement of trucks	

Regular trucking of marble/ granite sludge & stone break-offs to abandoned borrow pit	- Workforce - marble/ granite break-offs & sludge/ dust - Hydrocarbons to power mobile machinery	- Regular movement of trucks on proposed waste haulage road	- Possible disputes with affected communities - Regular movement of heavy vehicles on widened access road would result in traffic compaction, which in turn has potential to increase runoff & risk of flooding during rainy seasons - Risk of hydrocarbon spillages	- Possible procurement opportunities to trucking contractors & security companies - Opportunity to rehabilitate abandoned borrow pit - Opportunity to eliminate problem of excess dust in town generated from the processing site - Opportunity to curb risk of children drowning during the rainy seasons at the borrow pit
Disposal of marble/ granite sludge & stone break-offs	- Bull dozer, workforce - In situ soils & granite/ marble waste as layered deposition is recommended	- A reclaimed & rehabilitated borrow pit site - Controlled & regulated deposition of selected solid waste at the pit	- Dust & noise pollution during ground movement & levelling activities	

	- Top soil reserve for surface cover - Hydrocarbons to power mobile machinery to be used for landscaping purposes		- Interruptions to marble/ granite waste disposal activities during rainy seasons due to possible flooding of waste site & difficulty of drying out the sludge - Compromised relationship with affected community if they do not benefit from the waste haulage & disposal activities	- Reduction in space constrains at the stone processing site will open up space for plant capacity expansions, & as well as improve percentage of water recovery & reuse - Improvement in Marmorwerke's public reputational image due to improvement in solid waste management

3 PROJECT ALTERNATIVES

This section explores alternatives that were considered and weighed up, and lists those deemed to be most feasible. The viability of the selected alternatives/options is based on those that were found to be less damaging to the environment, while maximizing potential benefits from the current and proposed additional activities.

According to the 2012 EIA Regulations the definition of the "alternatives", in relation to a proposed activity, refers to different means of generally meeting the same purpose and requirements of a proposed activity, which may include alternatives to –

- (a) the property on which or location where it is proposed to undertake the activity.
- (b) the type of activity to be undertaken.
- (c) the design or layout of the activity.
- (d) the technology to be used in carrying out the activity; and
- (e) the operational aspects (or modus operandi) of the activity

The concept of considering alternatives thus ensures that the environmental assessment process is not reduced to the defence of a single project proposal that is to the desire of the proponent, and therefore, provides an opportunity for unbiased considerations of options, to determine the most optimal course of action from an environmental perspective.

Alternatives weighed and considered for this project are with regards to:

- Location of proposed additional activities.
- Dimension stone block processing methods and technologies
- Water and power supply sources
- Waste management options in terms of the general waste management hierarchy.
- The ''No-action'' alternative for management of marble/ granite dust and sludge.

3.1.1 Limitations to the Project Alternatives

In assessing possible alternatives to each of the above-listed aspects, the following factors were considered in accordance with best practice procedures as outlined under DEAT (2004):

- **Resource locality** – where alternative locations could be considered for the same resource and such alternatives are justified by economics.
- **Technological limitations** - where high costs or the environmental unfriendliness of a technology may prevent it from being considered as a viable option, or the lack of technological development may preclude certain options from consideration

- **Environmental limitations** – where environmental factors such as climate, geology, hydrology, hydrogeology, potential impacts on the local ecology may prevent or favour consideration for an option.
- **Socio-economic limitations** – where socio-economic factors such as distance to material source, markets and/ or waste management sites; availability of supporting infrastructure such as water and electricity; current and future land-use; cultural significance; presence of archaeological sites and impacts on livelihoods may hinder or enhance consideration for an option.

3.1.2 Project Location Alternative

In the context of this project the location alternative is only relevant to the proposed waste haulage road and the abandoned borrow pit as the stone processing facility is already in place and is of a fixed nature. Four location options were considered for the disposal of marble/ granite dust and stone break-offs as highlighted below in

Table 3-1. The main deciding criteria here was the haulage distance from the stone processing facility, proximity to areas of residence, land tenure or ownership, and the anticipated costs for site acquisition, site construction, site preparation works and site operations. The various options are portrayed in **Figure 3-1**.

Table 3-1. Marble/ granite dust disposal site selection criteria adopted by Marmorwerke Karibib

OPTION	SITE SELECTION CRITERIA ADOPTED				REMARKS
	DISTANCE FROM PROCESSING PLANT	PROXIMITY RESIDENCE	LAND OWNERSHIP	ANTICIPATED COSTS	
OPTION 1 – Existing active quarry within Karibib Townland	- 3 km	- reasonably far from places of residence	Karibib Town Council	- Although there is an existing hole (quarry) that can be backfilled, costs of reshaping will be high due to high excavatability costs as the site sits in hard bedrcok	- Disposal of marble/ granite waste will interfere with active quarrying operations and aggravate dust generation - Second least favoured option
OPTION 2 – Abandoned borrow pit within Karibib Townland	- 2 km	- reasonably far from places of residence		- An open pit already exists in the ground, and the subsurface primarily comprises alluvial soils; hence costs of reshaping would be minimal and reasonably easy	- **Most favoured** site because of: short haulage distance; site is abandoned and not being utilized and is therefore available immediately; site is not pristine; availability of natural soils to enable layered disposal of marble/ granite waste; minimal site preparation works required; and backfilling will solve risk of flooding and drowning.

			Karibib Town Council – consent to utilize the site for marble/ granite waste disposal granted until new municipal landfill is commissioned		
OPTION 3 – new municipal landfill within Karibib Townland	- within reasonable distance	- reasonably far from places of residence	Karibib Town Council	- Costs of construction and operation would be high. Availability of funds to construct and commission the site is largely dependent on buy-in from private donours	- The site not yet available and hence waiting for the site to become available will prolong the ongoing excess dust generation in the town. Hence, for short term marble/ granite waste disposal this option is not favoured

OPTION 4 – Existing BC quarry on Farm Okawayo	- 16 km (Too far)	- Far from places of residence	Private Farmer	- High cost for site leasing or purchasing - High haulage costs	- Least favoured option due to long haulage distance; likely high costs of land leasing or purchasing

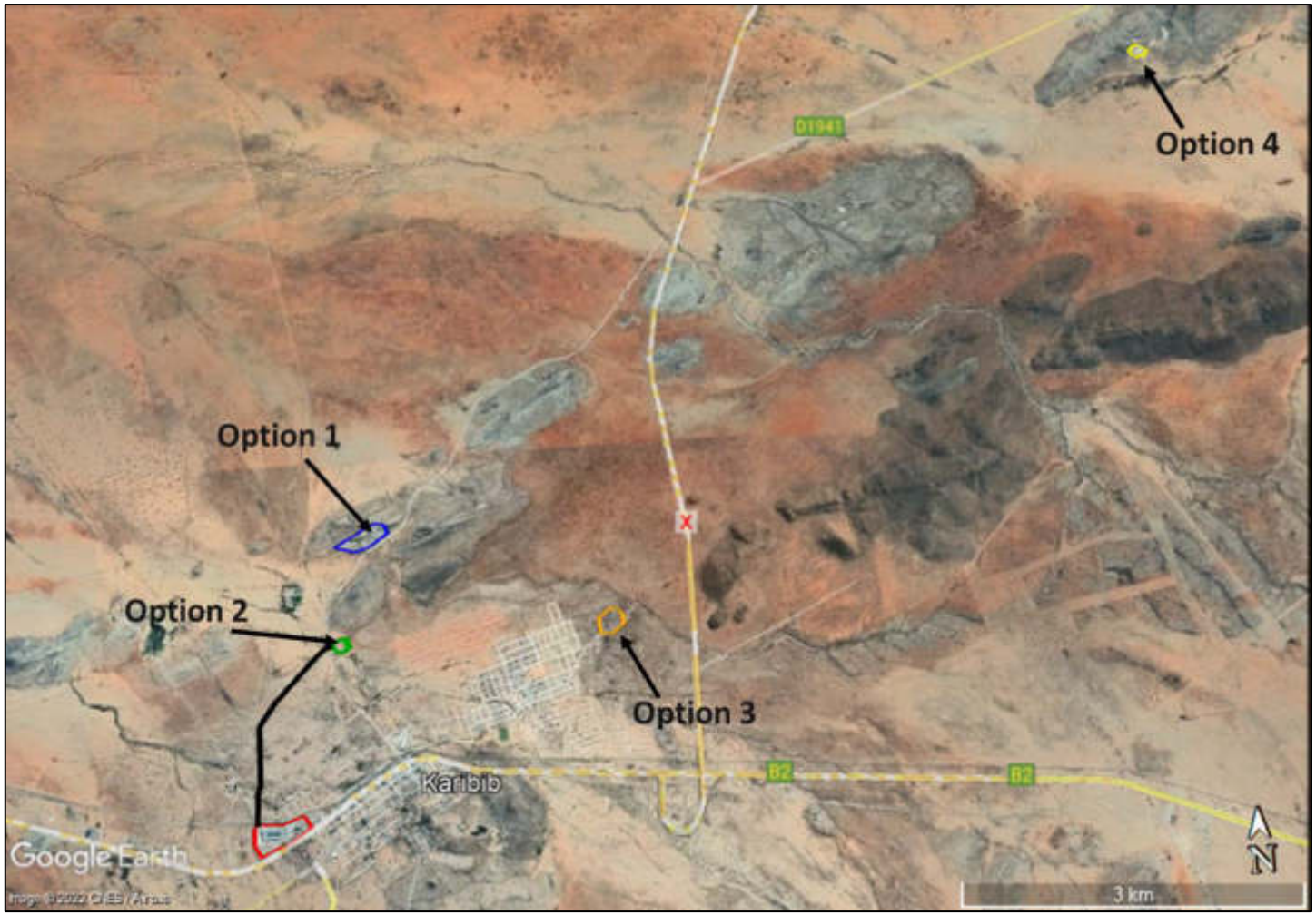


Figure 3-1. Site options considered for disposal of marble/ granite waste

In light of the criteria presented above, Site Option 2 proved to be the most favourable.

3.1.3 Alternatives to stone processing methods and technologies

Upon entering the processing facility the blocks are first dressed on parallel dressing machines before shifting to gangsaws to remove unevent surfaces. Thereafter the blocks enter the processing value chain where they are cut into 20 to 30 mm thickness slabs by means of gang saws, multi and single wire saws. In the mosaic plant the slabs are cut into 10 to 12 mm thickness. Each saw is brazed with a number of diamond segments which act as teeth and cut the block into required thickness. During the block cutting operation water is continuously sprinkled on the blocks to reduce heat and dust generation. The wet dust or sludge generated typically remains suspended in process water and drains to zigzag kind of water storage/ recycling dams, where the solids settle out and the remaining supernantant is recycled back into the process. The slurry sludge is recovered and removed from these water dams either through pumping or by means of an excavator or TLB, and is subsequently, stockpiled into heaps on the processing facility's site. Once the material has dried out to some extent it is then spread over the yard by means of a front-end loader or dozer.

For polish the tiles, slabs and tops polishers and trimmer machines are used. After polishing, where necessary rust remover and stone sealer are used to remove any stains on the slabs, tops or tiles. Thereafter, agents such as resin, hardner and fiberglass webbing are added to the slabs, tops and tiles to increase the durability of the product.

Based on literature review of the dimension stone processing industry, the technology that is currently used at the Marmorwerke Karibib Plant is the most recent and efficient available technology in the industry at the time of compiling this report. For this reason, no alternatives to the currently employed technologies could be identified.

3.1.4 Waste Management Alternatives

For each of the various types of waste generated, alternatives were considered in terms of the general Waste Management Hierarchy which promotes waste avoidance through elimination/ prevention and reduction of waste before reuse, recycling, treatment and disposal strategies. For each waste type the most feasible option was selected based on the judgement of the author. Due consideration was given to technological, socio-economic, and environmental limitations in selecting the most feasible option for each type of waste. The alternatives considered in this regard are presented in **Table 3-2** below.

Table 3-2. Waste Management options/ alternatives considered for this project

Category of Infrastructure	Alternative Considered	Current or Proposed Waste Management Practice
Used oils, diesel, grease, & lubricants	Eliminate/ prevent	Used oils, diesel and lubricants are currently collected from site by a designated off-take contractor for recycling and reuse purposes. This practice is deemed appropriate and will continue going forward
	Reduce	
	Re-use	
	Recycle	
	Dispose	
Scrap metals	Eliminate/ prevent	Scrap metals are currently collected from site by a designated off-take contractor for reuse and recycling purposes. This practice is deemed appropriate and will continue going forward
	Reduce	
	Re-use	
	Recycle	
	Dispose	
Waste wood	Eliminate/ prevent	Waste wood are either burned or removed by Karibib town council garbage removal for disposal at local municipal waste dump site. This practice is deemed appropriate and will continue going forward
	Reduce	
	Re-use	
	Recycle	
	Dispose	
Domestic/ Office waste	Eliminate/ prevent	Removed by Karibib town council garbage removal for disposal at local municipal waste dump site. This practice is deemed appropriate and will continue going forward
	Reduce	
	Re-use	
	Recycle	
	Dispose	
Waste stone break-offs or off-cuts	Eliminate/ prevent	Currently these materials are packaged in 1ton bags which are then sold to overseas markets for re-use and recycling to make artificial slabs, tops and tiles. This practice is deemed appropriate and will continue going forward
	Reduce	
	Re-use	
	Recycle	
	Dispose	
Marble/ granite dust and sludge	Eliminate/ prevent	Currently, this material is stockpiled in heaps on the stone processing facility site until it has dried to a workable moisture content, and thereafter it is spread across the site as backfill by means of front-end loader or bull-dozer. This practice is no longer deemed suitable because it is currently causing excessive dust generation in the
	Reduce	
	Re-use	
	Recycle	
	Dispose	

Category of Infrastructure	Alternative Considered	Current or Proposed Waste Management Practice
		town. Consideration to get an off-taker for the dust was deliberated on but it was revealed by management that most potential off-takers are only interested in near pure marble dust. Other options deliberated on include conducting further studies to evaluate suitability for re-using the dust in brick making. Due to the urgent need for a pragmatic solution to the excess dust generated in the town it is proposed that as an immediate solution slightly moist sludge be trucked to the identified abandoned borrow pit and disposed off into the pit in alternating layers with natural soils and some marble/ granite break-offs
Plastic materials	Eliminate/ prevent	Removed by Karibib town council garbage removal. This practice is deemed appropriate and will continue going forward
	Reduce	
	Re-use	
	Recycle	
	Dispose	

3.1.5 No-Go Alternative for marble/ granite dust management

The "no action" alternative implies that the status quo remains, and nothing happens. Should the proposal to dispose off marble/ granite dust and sludge be discontinued, none of the potential benefits would be incurred. If the proposed project is to be discontinued, the current land use for the proposed disposal site will remain unchanged.

This option was considered and a comparative assessment of the environmental and socio-economic impacts of the "no action" alternative was undertaken to establish what benefits might be lost if the planned additional activities are not implemented. The key loses that may be incurred if the proposed additional activities are not implemented include:

- Continued illegal dumping at the proposed abandoned borrow pit.
- Continuation of excess dust generation from the stone processing facility into the town
- Continued risk of flooding of the open pit and likely risk of children drowning.
- Continuation of space constraints for dust storage on the stone processing premises.

- Environmental and socio-economic benefits such as reduction in employee and residents health risks, reduction in visual impacts would not be realised.

Considering the above losses, the "no-action/go" alternative was not considered a good option. Hence, this option was dismissed.

4 APPLICABLE LEGAL FRAMEWORK, POLICIES AND GUIDELINES

4.1 National Legislation

In Namibia all aspects related to the extraction and processing of mineral resources are vested in the state and are regulated by the Ministry of Mines and Energy (MME) whereas sustainable exploitation and management of the environment and use of natural resources is regulated by the Ministry of Environment, Forestry and Tourism (MEFT).

The Minerals Prospecting and Mining Act (Act No. 33) of 1992 is the principal act governing exploration, mining and beneficiation of mineral resources in the Republic of Namibia. From an environmental management viewpoint, this Act requires that an environmental impact assessment be undertaken prior to prospecting, mining/ quarrying and beneficiation operations, coupled with the development of implementable environmental management and monitoring plans where any changes to environmental conditions are anticipated. The Ministry of Mines and Energy is the custodian agency for the administration of the Mining Act.

Conversely, MEFT is the overseeing custodian agency for the administration and enforcement of the EMA, with the enforcement of the Environmental Impact Assessment Regulations of 2012 specifically being entrusted with the Department of Environmental Affairs and Forestry within MEFT. This Act stipulates that possession of an Environmental Clearance Certificate is a pre-requisite for the continuation of running or operating any activities that are listed under the Environmental Impact Assessment Regulations of 2012. The act further sets out under Section 58 and in the Government Notice No. 29 of 2012 a detailed framework and schedule for conducting Environmental Impact Assessments for mining and mineral processing companies or any entity that plans to undertake exploration, quarrying or mining, and/ or processing of mineral resources at any scale.

A review of the applicable and relevant local legislation, policies and guidelines to the existing operation and the planned new activities is given in this chapter. This review serves to inform the project Proponent, Interested and Affected Parties and the decision makers at the DEAF of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled for the existing and proposed activities to continue or commence, respectively. The applicable local (national) and where necessary regional/ internation legislation, policies and guidelines are given in **Table 4-1 and Table 4-3.**

Table 4-1. Applicable legislation, policies and guidelines to the proposed quarrying and crushing activities

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
The Constitution of the Republic of Namibia (1990)	Government of the Republic of Namibia	The Namibian government has adopted several policies that promote sustainable development. Most of these originate in clauses of the Constitution of the Republic of Namibia. In Article 95 (i), the State undertakes to actively promote and maintain the welfare of the people by adopting policies aimed at the utilisation of natural resources on a sustainable basis for the benefit of all Namibians. Articles 91(c) and 95(l) are also of relevance to sound environmental management practice. In summary, these refer to: • Guarding against over-utilisation of biological natural resources. • Pursuing sustainable natural resource use • Limiting over-exploitation of non-renewable resources. • Maintaining biological diversity • Ensuring ecosystem functionality. • Protecting Namibia's sense of place and character. Through implementation of the mitigation measures set out in this Environmental Overview and Environmental Management and Rehabilitation Plan (EMRP), the owner of the ECC shall be advocating for sound environmental management as set out in the Constitution.
Environmental Management Act No. 7 of 2007 and its 2012 EIA Regulations Government Notice 28-30 (Government Gazette 4878	MEFT: DEA	Part 2 of the Act sets out 12 principles of environmental management, summarized as follows: • Community involvement in natural resources management, must be promoted and facilitated. • The participation of all I&APs must be promoted and decisions must consider the interest, needs and values of I&APs. • Equitable access to environmental resources must be promoted and the functional integrity of

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		ecological systems must be considered to ensure sustainable systems. • Assessments must be undertaken for activities which may have significant effects on the environment or the use of natural resources. • Sustainable development must be promoted in all aspects relating to the environment. • Namibia's cultural and natural heritage including, its biological diversity, must be protected and respected. • The option that provides the most benefit or causes the least damage to the environment, at a cost acceptable to society must be adopted to reduce the generation of waste and polluting substances at source. • The reduction, re-use and recycling of waste must be promoted. • A person who causes damage to the environment must pay the costs associated with rehabilitation of damage to the environment and to human health caused by the pollution. • Where there is sufficient evidence which establishes that there are threats of serious or irreversible damage to the environment, lack of full scientific certainty may not be used as a reason for postponing cost-effective measures to prevent environmental degradation; and • Damage to the environment must be prevented and activities which cause such damage must be reduced, limited, or controlled. • In terms of the terms and conditions attached to the current ECC the proponent is required to renew the ECC after every 3 years. Such renewal process is expected to review the current conditions of the environment, document ongoing and planned activities, evaluate how the ongoing and planned activities will likely alter the current conditions of the environment, and formulate impact management measures that

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		speak to the current and future status quo of the affected project area. The proponent has the responsibility to ensure that the existing and proposed activities, as well as the proposed impact management measures, conform to the principles of this Act. In developing this EMRP, OGGC has been cognizant of these requirements, and accordingly the process that was adopted has been undertaken in conformance with this Act and the EIA Regulations (2012). Several listed activities in terms of the Act, are triggered by the ongoing and proposed activities as set out in the following table.
Mineral Prospecting & Mining Act (Act no. 33 of 1992)	MME	Sections 50, 52, 54, 57 and 130 of this Act sets out provisions for environmental management for activities arising from mineral exploration, quarrying/ mining and beneficiation, as follows: • Operators of mineral processing facilities are required to prepare an ESA or EIA and an EMP and make revision of such EMP every 3 years • That the Operator of a mineral processing facility is liable to pay compensation where in course of the mining operations; any damage is done to the surface of land, water source, cultivation, building or any other structure • That the Operator of a mineral processing facility cannot exercise any rights on a private land until the holder has entered into an agreement with the owner regarding payment of compensation • That the Operator of a mineral processing facility shall take all necessary remedial steps to reasonable satisfaction of the minister for any damage caused by mineral processing operations on closure of such facilities. • That the minister is empowered to direct the Operator of a mineral processing facility for carrying out good reconnaissance, mining and prospecting practices for the protection of the environment, and conservation of natural

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		resources payment of liability fees and royalty and remedial steps for any damages and • That the Operator of a mineral processing facility shall report pollution in course of any operations and make remedial measures for such. The abovementioned provisions are all relevant to the ongoing and proposed additional activities and were thus considered in the Environmental Overview and EMRP updating process.
Charter for Sustainable and Broad-Based Economic and Social Transformation in the Namibian Mining Sector 2014 – 2020 (The Namibian Mining charter)	The Namibian Chamber of Mines of Namibia	This charter aims to facilitate meaningful participation of historically deprived Namibians in the mining and mineral beneficiation industry. It has effectively been developed as an instrument to effect transformation and sets specific targets for mineral license holders and Operators of mineral processing facilities active in Namibia
The Minerals Policy of Namibia, 2003	Ministry of Mines and Energy	This policy sets out guiding principles and directions while communicating the values of the Namibian people in pursuit of the development of the mining and mineral resources beneficiation sector.
Pollution Control & Waste Management Bill	MEFT and others	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill repeals the Atmospheric Pollution Prevention Ordinance (11 of 1976). In terms of water pollution, it will be illegal to discharge of, or dispose of, pollutants into any watercourse without a Water Pollution Licence (apart from certain accepted discharges). Similarly, an Air Quality Licence will be required for any pollution discharged to air above a certain threshold. The Bill also provides for noise, dust or odour control that may be considered a nuisance. The Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		activity relating to waste or hazardous waste management. The ongoing beneficiation of dimension stone and then planned disposal of marble/ granite dust waste at a designated off-site area would not entail the discharge of large quantities of gaseous pollutants into air but may result in increased noise levels, dust generation, destruction of in situ soil structure during such operations.
Water Act (No. 54 of 1956)	MAWLR: Department of Water Affairs	Makes provision for several functions pertaining to the management, control and use of water resources, water supply and the protection of water resources. **The Proponent shall prevent any potential pollution of groundwater and surface water. Water shall be used in a sustainable way.**
Water Resources Management Act (Act No. 11 of 2013)		This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Should the proponent wish to undertake activities involving water abstraction and/or effluent discharge, the relevant permits will have to be applied for. Furthermore, any watercourse on/or near the abandoned borrow pit site and associated ecosystems should be protected in alignment with the principles above. Additionally, since water for the beneficiation facility is directly sourced from the municipality maximum efforts must be made to recycle as much of this water as possible in order to reduce and minimize intake of new water. Mitigations measures are included in the updated EMRP to reduce impacts on nearby watercourses that could not be avoided
Nature Conservation Ordinance (Act No. of 1996)	MEFT	The Nature Conservation Amendment of 1996 (section 73.1) provides for an economically based system of sustainable management and utilization of game in

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		communal areas; to delete references to representative authorities; and to provide for matters incidental hereto. Although the project sites are not located within protected areas, there is indigenous vegetation in the vicinity of the abandoned borrow pit site and therefore this Ordinance is relevant. A permit would be required should any species onsite, with a protected or endangered status, be damaged or removed. If required, the proponent will apply for such a permit prior to commencing with the proposed activities.
Forestry Act (Act No. 12 of 2001)	MEFT	The Act provides for the management and use of forests and forest products. Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse." The proponent will apply for the relevant permit under this Act if it becomes necessary.
Soil Conservation Act (Act No. 76 of 1969)	MAWLR	The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister. This Act is applicable since stripping and disturbance of topsoil will take place during the widening of the waste haulage road and reshaping of the abandoned borrow pit. Mitigation measures are included in the EMRP to preserve topsoil and reduce impacts on topsoil.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
Regional Councils Act (Act No. 22 of 1992)	MURD	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage, and evaluate development in the regions. The relevant Regional Council for this project is the Erongo Regional Council which is an I&AP and has been provided with the opportunity to comment on the proposed project activities.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	MME: Petroleum Affairs Division	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area. **This law is applicable to this project because used diesel and other types of oils in excess of 600L are sometimes stored on the processing facility site in sealed containers prior to being collected by a designated off-taker. These products are primarily stored in the vicinity of the mechanical workshop.**
National Heritage Act (Act No. 27 of 2004)	MEAC	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. Section 51 (3) sets out the requirements for impact assessment.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		No objects of heritage or archaeological relevance were noted in the project area. However, should any objects of heritage/ archaeological significance be identified during project activities, the work must cease immediately in the affected sites and the necessary steps taken to seek authorization from the Council.
Public Health Act (Act No. 36 of 1919)	MoHSS: Occupational Health	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health. The proponent must ensure that the facility continues to be operated in a way that is safe to both the employees and the general public. Noise and dust emissions which could be considered a nuisance and/ or a health risk ought to be kept to acceptable levels. This is applicable during the ongoing processing activities as well as during the fencing, reshaping of the abandoned borrow pit and widening of the proposed waste haulage access road. Additionally, the block cutting, sawing, polishing and packaging processes entail usage of dangerous machinery as well as lifting operations that could cause severe injuries or even fatalities.
Labour Act, 2007	MLIEC	Sections 3, 4, 5, 11, 16, 23-27, 44 and 135 make provision for the following: • That a person may not employ a child under the age of 14years • That children are prohibited for employment in a mine and other dangerous circumstances • That forced employment of persons is prohibited • That an employee is entitled to monetary remuneration daily, weekly, fortnightly, or monthly in cash, cheque, and direct deposit into a bank account • That the work hours of an employee are 45 hours in a week, over and above which an employee is entitled to additional payment overtime wage

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		• That employees are entitled to (a) annual leave on the basis of the average number of days worked over the year, (b) a day's sick leave for every 26days worked, (c) compassionate leave for a period of 5days in 12 months which is fully paid, and (d) leave on public holidays, • That female employees that have completed 6 months of employment are entitled to 12 weeks of maternity leave, which can be extended for a further period of one month • That the minister is empowered to make regulations in relation to safety, health, hygiene, sanitation, and welfare of persons employed in or about mines, including sea-bed operations The proponent is expected to be compliant with the above provisions and as such the above provisions were accounted for in this report.
Relevant Guidelines, Policies and Regulations		
Environmental Assessment Policy (1994)	MEFT: DEA	This policy aims to promote sustainable development and economic growth while protecting the environment in the long term by requiring environmental assessment prior to undertaking of certain activities. Annexure B of the policy contains a schedule of activities that may have significant detrimental effects on the environment, and which require authorization prior to undertaking.
Mine Health & Safety Regulations (under section 138A of the Mining Act, 1992)	MME: Mine Safety & Services Division MoHSS: Occupational Health Division	These set of regulations are aimed at ensuring that mines are operated in a safe manner to prevent fatalities, injuries, and long-term health hazards. The regulations make provision for: • Employee's right to leave unsafe working places • Obligation of a mine manager to provide for all safety measures in a mine or quarry • Reporting of accidents to the chief inspector and keeping a record of such accidents • Requirements for the mine manager to provide occupational health services at area of mining activity

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		• Requirements for stability of excavations; provision of waiting areas; provision of fencing and gates; schemes for working in vicinity of water body. • Provision for mine dump or mine tailings facility • Ensuring that all parts of a mine are well ventilated with minimum standards of air quality • The mine manager's responsibility to formulate a scheme for safe movement of vehicles being use in the mine/ quarry • The mine manager's responsibility to formulate a scheme for identifying hazards at the area of mining activity and provision of appropriate protective equipment • Ensure that the mine manager provides first aid and firefighting equipment and procedures where exploration/ quarrying activities are being conducted All the above-mentioned provisions are relevant to this project and were thus considered in the EMRP.
Atmospheric Pollution Prevention Ordinance (1976)	MoHSS	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.
Hazardous Substance Ordinance, No. 14 of 1974	MoHSS	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling. This Ordinance is relevant to the project under review as potentially toxic substances such as rust removal chemicals for tops and slabs, and polishing raisin are stored on the processing facility site.
Karibib Town Council's Integrated Solid Waste	Karibib Town Council (Local Economic Development,	Aims to ensure the Town Council, its staff, contractors and stakeholders that all waste are stored, collected, transported and disposed of safely and correctly without

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
Management Policy	Environmental Health & Corporate Services)	endangering human health or cause harm to the environment.
National Solid Waste Management Strategy of Namibia	MEFT and Local Municipalities	The Vision of this Strategy is for Namibia to become the leading country in Africa in terms of standards of solid waste management by 2028. The **Specific Objectives** of the Strategy are: 1. To strengthen the institutional, organisational and legal framework for solid waste management, including capacity development. 2. To install a widespread culture of waste minimisation and to expand recycling systems. 3. To implement formalised solid waste collection and management systems in all populated areas, including under the administration of Regional Councils. 4. To enforce improvements in municipal waste disposal standards. 5. To plan and implement feasible options for hazardous waste management including healthcare waste management According to the management of Marmorwerke Karibib the current processing of dimension stone blocks results in approximately 20 – 30% waste as stone break-offs and about 10 – 20% as dust or sludge. Hence, in total the percentage of solid waste produced from the cutting, sawing, shaping and sizing operations of the natural stones is approximately 50%. This is a significant quantity of solid waste, in addition to other forms of solid wastes such as office/ domestic litter, waste wood from packaging operations, scrap metals, used tyres, etc.
The Mineral Beneficiation Strategy of Namibia	MME and Ministry of Industrialization and Trade (MIT)	This national strategy was developed and launched in 2021through collaboration between Ministry of Mines and Energy and the German Corporation for International Cooperation (GIZ), and aims to facilitate the realisation of full social and economic potential that can be derived from Namibia's minerals and to promote investment, trade and industrial development.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		This document provisionally identifies a selection from diamonds, coloured gemstones, zinc, industrial minerals (gypsum, dimension stone, limestone), iron and steel foundry products, battery minerals (lithium and graphite) and salt as pilot projects for mineral beneficiation in Namibia.
Phase 3 to 5 – Best Practice Guide - Environmental Principles for Mining in Namibia during construction, operation and closure	MEFT and MME	This best practice guide provides guidelines on integrated waste management for mining related processes during the construction, operation, maintenance of mining support infrastructure. The guidelines further consider closure of mining and mineral beneficiation projects

The current and proposed project activities are expected to trigger the listed activities summarised in Table 4-2.

Table 4-2. Summary of relevant acts and applicability thereof (in terms of licenses, authorizations and or permits) as listed in the 2012 EIA Regulations

ACTIVITY	DESCRIPTION OF ACTIVITY	RELEVANCE OF LISTED ACTIVITY
Activity no. 2.1	The construction and operation of facilities for waste sites, treatment of waste and disposal of waste	The proposed additional activities will require construction of a concrete lined sloping pad on site for pre-disposal drainage and drying of the sludge, as well as the fencing and reshaping of the abandoned borrow pit.
Activity No. 3.1	The construction of facilities for any process or activities which requires a license, right or other form of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting & Mining Act), 1992	The proposed project activities require consent for waste disposal from the Karibib Town Council. In addition, the current and proposed activities require environmental clearance prior to commencement as per the EMA

ACTIVITY	DESCRIPTION OF ACTIVITY	RELEVANCE OF LISTED ACTIVITY
Activity No. 3.2	Other forms of mining or extraction of any natural resources whether regulated by law or not	The current and proposed project activities require surface clearing and excavation over the footprint of the proposed waste haulage road and the abandoned borrow pit. Furthermore, the entire project scope is centered around the beneficiation of dimension stones.
Activity No. 3.3	Resource extraction, manipulation, conservation & related activities	
Activity No. 9.4	The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 m^3 (30 000L) at any one location	Significant quantities of raisin are stored on site in sealed containers to be used in the polishing of slabs, table tops, cladding stone and tiles. Raisin is also used together with a spider-type mesh to improve the structural integrity of finished products. Some amount of new and used diesel and grease are also stored on site
Activity No. 10.1 (b)	The construction of access roads	The proposed project activities will include the widening of an existing track between the stone processing facility and the abandoned pit to facilitate waste haulage.

4.2 Regional and International Guidelines, Treaties and Conventions

Regional and international laws, treaties and conventions applicable to the project are as listed in **Table 4-3** below.

Table 4-3. International Treaties and Convention applicable to the project

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
The United Nations Convention to Combat Desertification (UNCCD	Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change	The project activities should not be such that they contribute to desertification.
National Environmental Management: Waste Act (Act	Regulates inter alia the duty of care, management, transport and disposal of waste including mining waste such as residue deposits and residue stockpiles. Furthermore, this Act regulates the rehabilitation of contaminated land and waste disposal facilities including mining waste	

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
no.59 of 2008) – Republic of South Africa	facilities. Section 16(1) of this Act provides that: "A holder of waste must, within the holder's power, take all reasonable measures to: a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated; b) reduce, re-use, recycle and recover waste; c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts; e) prevent any employee or any person under his or her supervision from contravening this Act; and f) prevent the waste from being used for an unauthorised purpose." This Act also provides for a licensing regime specific to waste management activities. Category A activities require a BA process to be undertaken, whilst Category B activities require a S&EIR process to be undertaken. **In light of this Act this project would have required a Waste Management Licence, but because this Law is not enforceable within the republic of Namibia this requirement does not need to be met.**	
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: "a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
Mine Residue – Code of Practice (SANS 10286:1998).	Provides guidelines on the deposition and management of mine and beneficiation process residue in South Africa. In the absence of a local standard, this standard therefore becomes relevant to some extent as a guide for the design, construction and operation of new and existing mine residue facilities.	

5 DESCRIPTION OF THE RECEIVING ENVIRONMENT (BASELINE)

This section provides an overview of the current status quo of the climatic, biophysical and socio-economic landscape through the analysis of baseline data and information as deduced from field observations/ assessments, literature and community engagements. For this project the data has been collected through a desktop study of various data sources, existing literature as well as site observations and consultations with the project proponent, the immediate affected community and management of the Karibib Town Council. In this respect, baseline information is provided on the following receptors:

- Infrastructure & utilities
- Land-use
- Climate
- Biodiversity
- Topography, soils and drainage
- Geochemical & Geotechnical characteristics of marble/ granite waste
- Visual sense of place
- Air quality
- Socio-economic aspects (Governance, Health, Education, Employment, Business activities/ ooprtunities)

The aim of this section is to provide a baseline against which changes that may occur as a result of the current and proposed project activities can be measured, gauged and monitored through time.

5.1 Relevant Aspects of the Current Physical & Biological Environment

5.1.1 Infrastructure & utilities

The current infrastructure at the processing facility includes the following components:

- Approximately 17 000 m^2 floor plan of single storey steel frame, beam supported and mansory building structure for stone cutting, trimming, smoothening & polishing facility
- Approximately 1000 m^2 floor plan of single storey steel frame, beam supported and mansory unit structure for final product packaging & warehousing

- Approximately 1900 m^2 Floor plan of single storey steel frame, beam supported and mansory unit building for spares warehouse
- Approximately 2200 m^2 of concrete lined 3 – 4 deep water recovery dams
- A 14 00 m long and approximately 4 high perimeter brick wall
- A single storey mechanical workshop
- 2700 m^2 of outside storage yard for heavy duty quarrying machinery
- Approximately 5100 m^2 of unlined/ unpaved block stockpile yard
- Approximately 3000 m^2 of storage yard for packaged stone breakoffs
- Site access road with surfacing of crushed marble
- Approximately 2850 m^2 of on-site accommodation for approximately 5 staff members
- Approximately 1100 m^2 of office buildings
- Security gate access control point
- Approximately 13 000 m^2 of un-utilized open space
- Over 4000 m^2 of roof fitted solar panels to supplement power from the grid
- Sewer and water supply infrastructure which is connected to the municipal main system

Power is partly supplied from the national grid via Erongo Red and partly from solar.
Water is currenyl supplied from the Karibib Town Council ,s water supply system.

5.1.2 Land use

Land use conditions for the stone processing facility will remain as an industrial area over the operational life of the facility. Conversely, the land use conditions for the existing borrow pit site will be altered by the proposed project activities as the area will temporarily change from an open public space to a fenced off natural stone and dust waste disposal area.
Currently, the site is fully accessible to the general public and is mainly used as an illegal waste dump site for construction rubble and garden refuse.

5.1.3 Climatic conditions

Data records from the Windhoek weather station for the period 2009 to 2019 was analysed to provide insight on climatic conditions around the project site. The data is based on records by the Namibia Meteorological Services. A summary of the analysis performed is provided below.

- Average annual temperatures of 32 degrees from October to December, with the coldest months in July with temperatures dropping to 9 degrees Celsius at night (Mendelsohn *et al.*, 2009).
- The average annual rainfall for the Karibib area is generally in the range of 200 to 300 mm, and is mainly experienced between December and March. The lowest rainfall may be expected in May, June, July and August with little to no rainfall anticipated during these months (Mendelsohn *et al.*, 2009).

- Relative humidity in the Karibib area ranges between 51 and 61% during the most humid months and between 21 and 28% during the least humid months.
- Average annual rates of evaporation in the Karibib area are generally range between 3000 and 3400 mm per year.
- Overall classification of the area in terms of climate: semi-arid and water deficit area with mean annual evaporations exceeding the mean annual precipitation.

5.1.4 Biodiversity

Data

5.1.4.1 Flora

The area around Karibib is referred to as the Western Highlands by Mendelsohn et al. (2002). This zone is typified by shrubs, while larger woody species such as *Acacia erioloba* are typically confined to drainage lines.

From a floral understanding and documentation view point two zones of vegetation were defined, namely: the plains and the rivers. The shrubs and trees found in these zones provide habitat or food for much of the fauna that is found in the area.

Because both of the concerned sites in this project have been extensively disturbed, there is generally little to no vegetation which may be threatened by the current and/ or future activities.

5.1.4.2 Fauna

According to Mendelsohn et al. (2002), it is estimated that at least 74 species of reptile, 7 amphibian, 87 mammals and 216 birds occur in the general and immediate area of Karibib, with known high level of endemism in reptiles and amphibians. These figures point towards a high probability for the occurrence of high biodiversity, but it must be noted that such fauna diversity is likely confined to farm areas around the town of Karibib and not in the town itself.
In light of the above, it makes sense to argue that fauna which may be affected by the current and proposed activities shall include roaming goats from the nearby informal settlement, reptiles and amphibians. Additionally, because the abandoned pit may have become a habitat for burrow animals, such fauna will likely adversely be impacted during the ground preparation and operational phases of the project.

5.1.5 Geochemical & Geotechnical characteristics of marble/ granite waste

As part of ongoing efforts by Marmorwerke Karibib (Pty) Ltd to find a solution for the short-term disposal of dry to slightly moist marble sludge and/ or dust generated from its Karibib stone processing factory, four (4) samples of marble dust/ sludge and two (2) samples of process water were collected from the site, and were ultimately subjected to geotechnical as well as

geochemical testing. The samples were primarily collected from the water recovery dams on site with one of the samples (KR_SL_2) collected from a dry stack at the time that was outside the main process plant.

In order to evaluate the pollution potential of the marble sludge/dust, this materials was assessed with respect to the following environmental aspects:

- Potential to generate dust,
- Net acid generating potential
- Likelihood of enhancing metal enrichment and
- Water quality of the process water and the likely impact of such water on the environment

The key findings from the laboratory test results and their implications on the proposed co-disposal of slightly moist to dry marble sludge/ dust at the existing borrow pit can be summarized as follows:

- The sludge/ dust has a high fines content which makes it susceptible to dust generation during transportation, disposal and storage. To ensure that dust generation is minimized during transportation and disposal to the proposed site the material must be transported as a thickened cake in slightly moist form (not in wet slurry nor dry form), and the tipper truck(s) bins should be covered during transportation. To minimize and mitigate dust generation at the proposed site during storage the following practices must be implemented:
    - The sludge/ dust must be deposited in alternating layers with the natural fill from the site. Layering will ensure that layers of the sludge/ dust are covered by coarser-grained natural fill after, say every 1.5m to 2m of deposition. This will also enhance drainage of the sludge layer, thereby reducing risk of liquefaction or ground failure during progressive loading.
    - At the end of every 1.5 – 2 m lift of sludge, the sludge should be levelled and then bucket compacted with a loader or TLB or dozer. This will enhance the bearing capacity of the ground and also contribute positively towards suppression of dust as the material will not be loose and easily releasable into the air.
    - It is further recommended that at any given point in time an arbitrary freeboard of 1 m must be maintained between the borrow pit's crest elevation and the elevation of deposited sludge.
- The high fines content coupled with the high liquid limit values of the sludge/ dust will likely compromise the bearing capacity of the borrow pit area; thereby making the site suitable for utilization of lightly loaded structures only in the future.
- The marble sludge/ dust was found to be non-acid forming based on the NAG test results as well as an anticipated negative NAPP induced by a high acid neutralizing potential caused by the high carbonate content. It was also found that the sludge/ dust is not enriched in toxic major elements such as Cr, Cd, Pb, Co, Ni, Cu, Zn or Mn,

and concentrations of these elements are largely well within accepted limits for human health and ecological soil quality as well as soil contamination levels

5.1.6 Topography, Soils and Drainage

The landscape at the proposed borrow pit area is relatively flat, and is predominantly covered by a thick succession of transported (likely alluvial) calcareous silty sand soils. The soils in this project area are generally loose to medium dense, and will therefore be associated with favourable excavatability conditions during the fencing and borrow pit reshaping phase.

Soils at the existing processing plant site have been altered from their natural state due to mixing with various external components such as marble/ granite dust and stone break-offs. The general landscape and soil conditions of the existing abandoned borrow pit site are depicted in Figure 5-1 below.

In terms of regional surface drainage the project sites are located between the Khan River (to the north) and the Swakop River (to the south), and surface drainage is generally well developed in the project area. Runoff is generally confined to small drainage channels, most of which are tributaries of the south-westward flowing Khan River.

Figure 5-1. General landscape of the existing borrow pit site (top image) and uneven ground within the existing borrow pit (bottom image)

5.1.7 Visual sense of place

The sense of pace of the operation stone processing facility site and the abandoned borrow pit areas has already been disturbed by the following activities:

- Stone cutting operations
- On site stockpiling and storage of marble/ granite waste (break-offs, sludge and dust)
- Uncontrolled borrowing and illegal waste dumping activities at the abandoned pit

It is envisaged that the newly erected 4 m high perimeter wall at the stone processing facility will block the view of any marble/ granite sludge or dust stockpiles from the B2 highway. Additionally, the fact that the borrow pit will only be backfilled upto the current ground elevation will prevent any compromise on the appearance of the landscape durng deposition and post closure as no above ground protrusions will be developed. During the widening of the waste haulage road and the reshaping of the pit, excessive dust and noise levels will alter the landscape. Adverse visual impacts currently exist at the abandoned pit area due to the eye soar nature of the informal pit as well as the presence of unorganised construction and garden waste. Additionally, adverse visual impacts may arise at the proposed marble/ granite waste disposal site for residents of the nearby informal settlement as this site may be visible from their homes. However, in the long run as the pit gets reclaimed in a controlled manner and is utimately covered up with top soil from the surrounding, these visual impacts will be eliminated.

5.2 Air Quality

Considering the excessive amount of dust that is currently generated at the stone processing facility, and the likely excess dust that would be generated at the proposed natural stone waste disposal site during the construction and operational phases, air quality is regarded to

be one of the most critical receptors for this project. For this reason, depositional dust monitoring stations are strongly recommended at the processing facility, along the waste haulage road and the proposed natural stone waste disposal site prior to commencement of the additional activities proposed for this project. A cost effective means to achieve this would be to make use of dust fallout buckets, monitor the data monthly, and benchmark these against accepted threshold values. At this stage the baseline dust fallout levels for the concerned sites are unknown.

5.3 Socio-Economic Aspects

5.3.1 Governance

Namibia has been an independent and democratic state since 1990, and as a result it has sound governance and stable social, economic and legal frameworks. The concerned project is located within the townland boundaries of Karibib in the Karibib Constituency which falls under the Erongo Regional Council. The Erongo Regional Council is responsible for the planning and development of the region for the benefit of its inhabitants by establishing, managing, and controlling towns and settlement areas. The Karibib Town council is responsible for planning and managing all land-use and service delivery aspects for the mining town of Karibib. The town council has a well-organised and robust governance structure, led by a CEO and several departmental managers. In the context of this project the town council currently ensures efficient and effective service delivery to the stone processing plant in terms of water and electricity supply, domestic/ office waste management, and management of land tenure. Revenue for the town council is generated through rates and taxes, sale of town land, and subsidies from the central government

5.3.2 Healthcare & Education

The constituency of Karibib comprises 1 district hospital and 3 clinics. In addition, the constituency is host to 2 government secondary schools, 2 government primary schools, 1 private primary and secondary school. Considering an estimated population of approximately 15 000 people, these facilities are deemed adequate to accomodate the educational and healthcare needs of the people living in this constituency. Despite this however, low levels of formal education prevent majority of households from earning a decent income.

5.3.3 Employment & Business activities/ opportunities

The Erongo Region is one of the most affluent regions in Namibia, and thus considered to comprise an economically active population. The majority of the workforce in the region is employed in the mining and fishing sectors, and for the area of Karibib majority of the working-class population are employed at the Navachab Gold Mine, active exploration companies such as Osino, and numerous natural stone quarrying and stone processing operations such

as the Marmorwerke Karibib operation. As such, it is noteworthy that the dimension stone sector plays a significant role in the betterment of the town.

6 PUBLIC CONSULTATION PROCESS

The Public Consultation process aims to ensure that all persons or organizations who may be affected or interested in the project are kept informed of potential issues and benefits, and can register their views and concerns. Building from there, the process provides an opportunity to influence the project design so that its benefits can be maximized, and potential negative impacts minimized. The current best practice model is to engage in a process of continuous dialogue with the affected community and other stakeholders as plans for the project evolve and the environmental assessment is advanced. A high level of interaction is maintained, potential and actual socio-economic plus environmental impacts are identified, and stakeholder needs and concerns are discussed and wherever possible built into the planned activities of the project, including decision-making and management practices. Good and transparent consultation helps foster genuine and positive relationships with mutual respect, shared concerns and objectives between the company pursuing or involved in the development and the community.

The public participation facilitator's role is to coordinate that process of dialogue to ensure there is transparency and accountability in decision-making and public confidence in the proposed activities and its management.

6.1 Registered Interested and Affected Parties (I&APs)

At the beginning of the environmental overview process, a list of the obvious stakeholders who needed to be informed about the proposed project was drawn up. As the public participation process evolved, this list of Interested and Affected Parties (I&APs) was continuously updated. A complete summary of the I&APs identified and registered for the project can be found in **Appendix E**. The pre-identified I&APs were notified about the planned activities by email, advertisement in local newspapers, and display of written notices at strategic points within the town of Karibib. Some of the I&APs on the list provided registered their names during the one-on-one consultation meeting held at the Karibib Town Council Hall on the 29th Day of January 2022.

Amongst key stakeholders identified and registered for this project were:

- **Central or national government:** Ministry of Environment, Forestry & Tourism, Ministry of Mines & Energy, Ministry of Agriculture & Land Reform, Ministry of Urban &Rural Development, Ministry of Industrialisation and Trade, National Heritage Council of Namibia (under the Ministry of Education, Ats & Culture)
- **Regional government:** Erongo Regional Council including the Karibib Constituency Council
- **Local authority and Parastatals**: Karibib Town Council, Usakos Town Council, Roads Authority, Local Authorities of Namibia, Nampower, National Heritage Council, Namibia Chamber of Mines, National Botanical Research Institute, Transnamib, Erongo Red, NCCI
- **Members of the public including residents of Karibib:** Attached **Appendix E**

6.2 First Round of Public Consultation: Summary of Activities Undertaken

To ensure that the I&APs were timeously and openly notified of the planned project activitie, the following tasks were carried out:

- A list of pre-identified I&APs was compiled. This list included representatives from government institutions (ministries, regional and local authorities) and representatives from non-governmental organisations (NGOs) such as the Botanical Institute of Namibia and the National Heritage Council.
- A notification email was circulated to all identified and registered I&APs on 17th January 2022 announcing the commencement of the EA process and an invitation to register as an I&AP as well as to attend the public consultation meeting which was scheduled for 09h00 on 29th January 2022. Included in this email was the Background Information Document (BID) which provided a description of the current and planned scope of activities for the ECC amendment, ownership transfer and renewal. A copy of this email trait is attached in **Appendix F**.
- Formal public notices announcing the commencement of the Environmental Assessment process and extending a formal invitation to the general public to register as I&AP as well as to attend the public consultation meeting were placed in *Die Republikein, The Sun Newspaper* and *Allgemeine Zeitung* newspapers (dated 11th January 2022 and 18th of January 2022, please refer to **Appendix F**).
- Printed formal written site notices were placed at various publicly accessible locations as outlined below.
- In addition, the BID was distributed on request to I&APs during the environmental overview process.Consultation/Public Meetings

The consultant first took initiative to engage the Town Council and seek the council's consent on the proposed reclamation of the abandoned borrow pit with a combination of natural soils, marble/ granite dust, and stoen breakoffs. These engagements were in the form of both virtual and in-person meetings with the management of the Town Council, and further included letter as well as memorandums. A summary of the main issues discussed during these engagements is included in **Appendix G**. After consent had been granted by the Town Council a public consultation meeting was scheduled for 29th Janaury 2022 in Karibib in order to engage the general public and affected communities. Overall, no objections with merit were raised or received from the I&APs in relation to the project. A consultation register and comment form submitted by one I&Aps is included in **Appendix G**. The details of these engagements are summarised in

Table 6-1 below.

Table 6-1. Summary of consultative engagements held in relation to this project

Person(s) Consulted	Organization	Platform of Engagement	Date	Key Comments/ Input/ Concerns registered
Mr. L. Goreseb (CEO)	Karibib Town Council	Letter titled: Permission for Disposal of Marble and Stone Off-cuts at identified sites within the Karibib	20 September 2021	- The letter sought permission from the Town council to grant permission to Marmorwerke Karibib for disposing off marble/ granite dust and stone offcuts at the abandoned borrow pit.
Mr. L. Goreseb (CEO)				- Management of the town council emphasized the need to probe risk of soil

Ms. S. Ilovu (Environmental Manager) Mr. S. Au-Khaob (Environmental Officer) Mrs. E. Tjombumbi (Technical Manager) Mr. Namene (Independent EAP for the proposed Landfill)		Virtual (Zoom) meeting	20 October 2021	contamination from deposition of marble/ granite dust or sludge at the abandoned quarry. A decision was made to ensure that geochemical analysis be performed on the dust prior to granting of any consent by the council. - Management of the council emphasized that there is an urgent need to find acceptable solutions to managing dust generated from the Marmorwerke Stone works - Council management acknowledged that the town council is in the process of designing a landfill that would be able to accommodate industrial, domestic as well as toxic waste, and that should the ECC to utilize the abandoned borrow pit for marble/ granite dust disposal such activities would only be permitted there until such time that the new land fill is ready and the pit had ben filled to the original ground level

Mr. L. Goreseb (CEO) Ms. S. Ilovu (Environmental Manager) Mr. S. Au-Khaob (Environmental Officer) Mrs. E. Tjombumbi (Technical Manager) Mr. Namene (Independent EAP for the proposed Landfill)		Technical Memorandum titled: Geotechnical and Geochemical Characterization of marble dust and process water from the Marmorwerke Karibib Stone Processing Factory in Karibib, Erongo Region	27 October 2021	- The technical memorandum was a response to work requested in the initial meeting to probe contaminant levels of the marble/ granite dust or sludge - The memorandum provides geotechnical and geochemical laboratory test results and summarizes key findings on thegeotechnical and geochemical properties of the dust/ sludge
Mr. L. Goreseb (CEO) Ms. S. Ilovu (Environmental Manager) Mr. S. Au-Khaob (Environmental Officer) Mrs. E. Tjombumbi (Technical Manager)		Letter titled: Request for provision written consent to reclaim existing borrow pit within the Karibib Municipal Townland with Marble dust and Stone offcuts generated from the Marmorwerke Karibib Stone Processing Factory	10 November 2021	- The letter sought to follow up with the management of the Town Council on the issuing of a provisional consent letter to Marmorwerke Karibib to reclaim and rehabilitate the abandoned borrow pit

				with a combination of natural soils, marble/ granite dust and stone offcuts
Mr. L. Goreseb (CEO) Ms. Selma Nghifindaka		Presentation to Karibib Town Council Management titled: Proposed Reclamation of an Existing Borrow Pit with marble sludge/ dust and Small stone offcuts from the Marmorwerke Karibib Factory in Karibib	8 December 2021	- The presentation was requested by the leadership of the town council for OMAVI to explain in layman's terms the key findings of the geotechnical and geochemical assessment in relation to the planned disposal of marble/ granite dust or sludge at the abandoned borrow pit.

The general Public	The general Public	Newspaper Advertisements in *Die Republikein, The Sun Newspaper* and *Allgemeine Zeitung* newspapers (	Publication dates: 11 January 2022 and 18 of January 2022	- The intent of the newspaper advertisements were to make the public aware of the project, provide them with a fair and timeous opportunity to register as I&Aps, and express their inputs on the project

The general Public	The general Public	In-person public consultation meeting at the Karibib Town Council Public Hall	29 January 2022	- The intent of the meeting was to make the public aware of the project activities, provide them with a fair and timeous opportunity to register and express any concerns they may have regarding the project. There were not pertinent issues registered regarding the project during this platform, but one of the attendees Ms. Bianca Foelscher raised concerns around a general lack of social corporate responsibility projects by dimension stone quarrying and processing companies to the community of Karibib and their tangible contributions to assisting the Karibib Town Council in ensuring efficient and effective service delivery to the people.

6.2.1 Public Site Notices

Written official site notices/posters informing the general public and the affected communities about the planned activities as well as notifying them of the planned public consultation meeting were placed at the following strategic locations as shown in **Appendix F**:

- Entrance to the Marmorwerke Karibib Facility
- Official notice board at Karibib Town Council's offices
- Official notice board at the Erongo Regional Headquarters in Swakopmund
- Official notice board at Karibib Town Council's offices
- Official notice at the abandoned borrow pit
- Official notice at notice board of Karibib OK store

6.3 Public Consultation Feedback: Issues &Concerns Raised

The key issues, concerns and feedback raised during the one-on-one engagements as well as through other communication platforms are summarised in **Table 6-2** below. The summary also includes responses from the EAP on how the various issues and concerns raised were responded to and how they will be handled during the implementation of the project.

Table 6-2. Key issues raised during the one-on-one engagements held

CATEGORY OF ISSUE RAISED	ISSUE(S) RAISED	RESPONSE OR RECOMMENDED MEASURE
Land Use	- Risk of uncontrolled access and illegal dumping at the abandoned borrow pit - The public may be inclined to illegally dump other waste at the abandoned pit after seeing continuous disposal of marble/ granite dust and sludge there. - In the long-run once the abandoned pit has been backfilled and rehabilitated will the site still be usable for urban development?	- The abandoned borrow pit site will be fenced off to control access. - Simultaneous backfilling of the pit with marble/ granite dust and sludge, natural soils and stone break-offs will give the ground some strength and bearing capacity. With the right geotechnical design and input, the municipality will still be able to utilize the site for development of lightly loaded structures.
Dust	- The current storage of dust on the processing facility site causes severe generation of dust in town	- Marmorwerke Karibib has made a commitment to no longer stockpile and store dust on its stone processing facility's premises in order to minimize risk of dust generation in the town

	- Transportation and disposal of the marble/ granite dust or sludge couldl induce further dust generation in town and near the proposed disposal site	- The proposed access road connecting the processing facility to the abandoned pit goes through the back side of town which is un-occupied. Hence, there is low risk of impact to residents during transportation of the dust to the proposed disposal site - Layered disposal between natural soils, marble/ granite dust and stone offcuts or break-offs will be adopted to minimize risk of dust generation at the pit - Limiting the speed of waste moving trucks to 40km/hr will reduce risk of dust generation from the proposed access road - Observations from site show that the dust/ sludge is only susceptible to excessive dust generation when it is dry and loose.
Chemistry of Marble/ Granite dust or sludge	- There were concerns raised by Management of the Karibib Town Council that the concerned dust may be toxic or may be enriched in some heavy metals, which could in turn contaminate the in situ ground	- Geochemical testing and analysis was performed on dry, moist and wet marble/ granite fines and the results showed that the material is non-acid generating, and is not enriched in heavy metals relative to average crustal composition
Nuisance	- Regular movement of trucks and earthmoving equipment between the facility and the dust waste disposal site will result in increased nuisance from noise. These regular movements will in turn increase risk of vehicle-livestock collisions in the area	- Haulage of the marble/ granite dust as well as the subsequent ground levelling of such waste at the disposal site by trucking and bulldozers/ front-end loaders, respectively, will strictly take place during day working hours
	- In the first engagement with the management of the town council Mr.	- In Namibia, the general management of solid waste is guided by the National Solid Waste Management Strategy which covers

Legal Compliance	Namene (an independent EAP) raised the question on whether disposing off the marble/ granite waste at a non-landfill site complies with local and regional principles of solid waste management	the management of domestic, industrial, commercial, healthcare and construction waste. - Because the concerned fine marble/ granite dust or sludge is a result of a mineral mining and treatment process, the material can be regarded as tailings. There is currently no local law that is specific to the management of tailings in Namibia. Hence, heavy reliance is typically placed on SANS10286, which is a guidance document on the Code of Practice for Mine Residue Deposits. In light of this document and on the basis of economic/ business principles in the mining and processing industries, waste management areas for tailings are always located in close proximity to sites of waste generation in order to ensure that the process is efficient and to ensure that operational costs are low.
Public participation	Ms. Bianca Foelscher of Karibib raised concerns on the following issues: - How the government of the Republic of Namibia and the general residents of Karibib would benefit from the current and ongoing activities - whether the general public of Karibib has been adequately informed about the project and via which communication platforms - How the concerned project proponent is actively contributing to improving the socio-economic profile of Karibib, and assisting the Karibib	- Marmorwerke Karibib is a legally registered entity, registered under the Company Act and there it is liable for collecting VAT, and paying various forms of taxes such as income tax, income tax through its employees, and to a greater extent cross-boarder or export levies when exporting final products to overseas markets - OMAVI made an effort to make the public aware of the proposed project activities through the placement of site notices at publicly accessible locations, publication of newspaper advertisements in 3 local newspapers for 2 consecutive weeks, email communication to registered I&APs, working closely with the Environmental Department of the Karibib Town Council to ensure that all relevant staff and/ or departments in the council have been adequately engaged about the project.

	Town Council in ensuring improved service delivery to the residents	- In regard to social corporate responsibilities Mrs. Cloete and Mrs. Liu of Marmorwerke Karibib indicated that their entity is currently one of the largest private sector employer in Karibib employing approximately 197 people of which 26% are females and 95% are Namibians. Additionally, they indicated that Marmorwerke has been one of the main sponsors of the following public campaigns: (1) Supply of covid-19 PPE to the Karibib Town Council, (2) Donations to the Karibib Private School, (3) the Blood Transfusion Campaign

7 ENVIRONMENTAL MANAGEMENT AND REHABILITATION PLAN

7.1 Purpose of the Environmental Management & Rehabilitation Plan (EMRP)

Regulation 8 of the Environmental Management Act's (EMA) (7 of 2007) Environmental Impact Assessment Regulations (2012) requires that an Environmental Management Plan (EMP) be updated regularly to ensure that at any given point in time it reflects a project's current state, and also to support any renewals for Environmental Clearance. The "draft" term has context in this regard to emphasize that the document (i.e. the EMRP) remains a working document which is to be updated continuously during the operational phase of the project to account for variations in site specific environmental conditions, technologies and methods being applied, business relationships between affected communities and project undertakers, and the market's demands as well as to accommodate feedback or results from the recommended monitoring programs. A 'management plan' is defined as:

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

The **EMRP is a legally binding document to the project proponent** and is one of the most important outputs of the EA process as it synthesises all the proposed impact mitigation or enhancement actions, as well as monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts anticipated from the current and planned project activities, and the required environmental management actions on the ground during project inception and subsequent day-to-day operations. **It is important to note that the custodian person or entity who contravenes the provisions of this EMRP may face imprisonment and/or a fine.**

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

- **Construction** - the period during which fencing and reshaping of the proposed waste disposal site is being carried out, including the proposed widening of the waste haulage road.
- **Operational phase** – during this phase, conventional beneficiation of dimension stone (as is currently the case) plus subsequent haulage and disposal of natural stone waste (slightly moist sludge and dust) will take place in a responsible manner to produce saleable and durable final products such as table tops, cladding stone and tiles.

- **Decommissioning and rehabilitation** – It is unlikely that the stone processing facility will be decommissioned. However, as per the terms and conditions of the consent granted by the Karibib Town council the proposed waste disposal site shall only be backfilled up until it has reached the surrounding natural ground level. Therefore, at some point this site will have to be decommissioned. The decommissioning phase represents the stage when disposal of natural stone waste will cease and the area shall be rehabilitated to restore the environment to a state that is as close as possible to the surrounding natural environment.

7.2 Limitations of the Draft EMRP

The following limitations apply to this EMRP:

- OMAVI Consultants assumes that all the project related information and data provided by the Proponent is correct and accurate, and that all necessary information has been disclosed which led to the development of this EMRP.
- It is also assumed that the relevant information obtained from different local literature consulted is accurate and;
- This EMRP has been compiled on an assumption that there will be no significant changes to the proposed project activities or the affected biophysical and social environment between the time of compiling this EMRP and implementation of the proposed additional project activities that could substantially alter the baseline information and planned impact enhancement or mitigation measures.

8 EMRP IMPLEMENTATION AND RESPONSIBILITIES

The EMRP has identified the Plant Manager; Safety, Health and Environment (SHE) Officer; and Public Relation Officer (PRO) as important roles to implement the environmental management and rehabilitation plan for the current and proposed additional activities. It should be noted that in practice, however, these roles may be assigned to and performed by one person, especially the last two roles.

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

8.1 The Plant Site Manager

This Manager will be responsible for the following:

- Managing/overseeing the implementation of this EMRP and ensuring that the EMRP is updated regularly as more or new data and information is collected.

- Issuing fines to or formally disciplining individuals who contravene EMRP provisions and if necessary, removing such individuals from site completely.
- Setting up and managing the schedule for the day-to-day activities; taking into account that daily safely briefs are held.
- Liaison with all relevant interested and affected parties/stakeholders.
- Ensuring all incidents are recorded, documented and reported to the relevant authorities.
- Undertaking a bi-annual review of the EMRP and amending the document when necessary.
- Draw up waste disposal schedules.
- Ensuring that all permits required for the operation are obtained timeously and are available on site at all times. Such permits include the ECC, SHE related files, Oil storage certificate, and Export Permits.

8.2 Safety, Health and Environmental (SHE) Officer

The SHE Officer will be responsible for the following activities:

- Planning, conducting and signing off site inductions to the workers on-site and visitors to the worksite(s).
- Developing area-specific reference safety, health and environmental manuals for all work sites, as well as quick SHE checklists that workers and visitors/ contractors may use for quick specific job risk assessments.
- Recording all SHE related incidences on site.
- Ensure availability of all PPE for employees and visitors
- Ensuring that the requirements of the EMRP are carried out during applicable activities throughout the project life span.
- Continuously implement the monitoring programs outlined in the EMRP and regularly give feedback on these.
- Ensure that trucks for delivering waste, final products or blocks are not overloaded

8.3 Public Relation Officer (PRO)

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

- Liaising between the Town Council/ Community and Marmorwerke Karibib.
- Ensure effective communication with stakeholders, media (if necessary) and the public.
- Managing public relations and dispute issues.
- Preparing and submitting public relations reports, if required.
- Collaborating with personnel and maintaining project-related open communication among personnel.

- Ensuring timely communication or notices of any special planned activities to interested and affected parties

8.4 Karibib Town Council and the affected Community

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

8.5 Ministry of Mines & Energy, Ministry of Environment, Forestry & Tourism and other relevant Organs of State

- Timeously formulate and enforce regulations that will drive research and cross-cutting industry sector collaboration (such as between cement & brick/ concrete/ pavers manufactures and the dimension stone processors) to ensure the off-take and reuse of natural stone dust from dimension stone processing facilities. In New Delhi – India, for instance, the government has made it mandatory for the following practices as pragmatic measures to improve management of natural stone dust:
    - All ordinary portland cement manufacturing unit utilize about 10-12% marble slurry.
    - All the Ordinary Portland Cement manufacturer have replaced OPC clinker with 3 to 5% of marble slurry during clinker grinding as a performance enhancer after reduction in moisture to the requirement of cement manufacturers and Indian Standards IS: 8112:1989 as amended.
    - Marble slurry as binder: sand ratio (1:3) shall be utilized as building material as per IS: 3466-1988 specifications. The marble slurry as low cost binder (Indian patent no. 189030) shall be utilized for non-load bearing structures as per Public Work Department (PWD) specifications. Technical work carried out by Shri Sampat Lal Surana on "Binder made from Marble Slurry: a solution to the problem" justified this practice.
    - Assures that any entrepreneur who wishes to manufacture Calcium Nitrate fertilizer from marble slurry waste may approach the concerned State Pollution Control Board (SPCB)/Pollution Control Committee (PCC) for obtaining

consents as required for establishment of such recycling industry. SPCB/PCC shall consider the application on priority basis.

$CaCO_3\,(s) + 2HNO_3\,(aq)$ --------> $Ca(NO_3)_2\,(aq) + H_2O\,(l) + CO_2\,(g)$

8.6 Technical Staff and Consultants

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

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

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN ACTIONS

This chapter presents a list of impact enhancement and/ or mitigation measures (management plan actions) related to this project.

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

These management plan actions are a ''translation'' of mitigation measures recommended to manage the potential impacts identified for this project.

9.1 Impact Enhancement/ Mitigation Actions AND Monitoring

The management plan actions for the enhancement of potential benefits and mitigation of potential adverse impacts are presented in

Table 9-1 below. Since there is quite an overlap in terms of impacts between the various phases of the project, the impacts have not been separated per phase of the project. The Table contains the following aspects:

- Project aspects, issues or activities for which management actions are required;
- Proposed impact enhancement/ mitigation measures;
- Key performance indicators for monitoring success levels of management actions;
- Responsible person(s) for implementing the proposed impact management actions;
- Resources (physical, knowledge/ skills as well as time) required for effectively implementing management actions and monitoring and;
- Implementation timeframes for the proposed management actions.

Table 9-1. Management Plan Actions for the Development, Operational, and Decommissioning Phases of the Project

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
ADVERSE IMPACTS						
Slope Instability of the borrow pit side walls	-Slope instability of the borrow pit walls following heavy rains	-Monthly site inspections by a geotechnical engineer or engineering geologist to assess stability of pit walls, and recommend stabilization measures where necessary	-Presence, frequency and extent of ground cracks, evidence of sloughing & distress in the side slopes -General condition of walls (is there evidence of slumping, loose material at base on slope, over-hanging material)	-Plant Manager (holds overall responsibility) - SHE Officer -Geotechnical Engineer/ Geotechnical Consultant (2nd in charge)	Technical Staff (Geotechnical Engineer) Excavator or TLB to flatten out oversteepened slopes	Once every quarter and as and when signs of ground instability or distress are detected/ observed
Soils	- Potential loss of topsoil during clearing works if top soil is not stockpiled & subsequently protected -Destruction of soil structure through excavation works, compaction works & traffic compaction along the waste haulage route as well as the proposed disposal site	-Top soil overburden should be stockpiled in designated areas during the widening of the access road as well as reshaping of the disposal site to avoid erosion and mixing with unfertile subsoils. Note that most top soil at the abandoned borrow pit has already been lost as it was not conserved during the establishment of the pit -Use subsoils only for the proposed interlayering with the dust & stone breakoffs. Place fertile topsoil on top only during decommissioning of the borrow pit	-Record any evidence of new traffic tracks outside of designated access roads by means of photographs -Record evidence of new erosion gullies or channels in the pit slopes or road shoulders (photographs) -Record evidence of soil contamination	-Health and Safety Officer (to seek input from Consultants with Soil Conservation knowledge) -Hired soil conservation scientist	-Technical Staff (Soil Conservation Scientist to offer training and monitor depth profiles as well as contamination levels) - Budgets to seek services of such specialists & effect monitoring	-Throughout the operational phase -Once every 6 months for monitoring depth of soil profile and contamination levels

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
	-Soil Erosion due to increased runoff along access road -Soil Contamination and Pollution from unexpected hydrocarbon spillages, etc - Possible increase in soil cementation due to spillage of CaCO3 rick dust – cementation has the effect of increasing runoff & therefore risk of flooding, as well as increasing hardness of soils during excavation	-Minimize disturbed footprint as much as practically possible at any given time along the proposed haulage route by ensuring that vehicles only drive within the road. This can be achieved by having elevated safety berms on either side of the road -Scoop up polluted soils and transport them to designated nearby landfills in Windhoek such as Kupferberg Landfill or the Walvis Bay Landfill -Enforce punishment for non-compliance in the form of disciplinary hearing - Provide soil conservation training to relevant staff such as operators of trucks & other earthmoving machinery - During the borrow pit/ proposed dust disposal site reshaping exercise the side slopes should be graded & compacted at the angle of repose of the in situ material (approximately 34 deg) to minimize erosion **- To prevent excessive migration of the fine marble/ granite dust**	- Monitor depth of soil profile and contamination levels every 6 months in areas on runoff & submit such with bi-annual environmental reports			

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		particles into the in situ soils, a compacted layer of silt sand mixtures or finer must be placed at the bottom and along the slopes of the facility during the reshaping exercise.				
Land Use	- The current access track & abandoned borrow pit are public open space, accessible to everyone. Once widened a portion of the access route will still be available to the public, however the borrow pit will be fenced off & shall be inaccessible to the general public. This will alter the land-use dynamics of these areas - Increased movement of trucks between the pit & the processing facility will conflict with current land use of small stock grazing in this part of town and	- Jointly, The Karibib Town Council & the proponent must issue a public notification during commencement of construction works that the abandoned borrow pit will no longer be accessible to the public & provide reasons. - Town council shall provide & approve alternative sites for sourcing borrow material of similar quality as those found at the abandoned pit -Fence off access roads, quarry site and crusher plant site to minimize risk of vehicle-animal collisions	-Official public notice issued by Town Council to the general public of the town that the abandoned borrow pit site is no longer available for public usage prior to commencement of any construction activities - Abandoned borrow pit/ dust disposal site effectively fenced off with access control - Evidence of illegal waste dumping in the area by means of photographs	-Production Site Manager (holds overall responsibility) - Town Council (PRO)	-Funds to acquire fencing material & install the fence, & widen the access road -Labour force to fence off sites	-Official notice to public on land-use change must be issued prior to commencement of any of the proposed fencing, reshaping &/ or access route widening activities -Fencing of current pit to be completed after reshaping of pit

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
	may increase vehicle-animal collisions					
Landscape & Sense of Place	- Changes to landscape due to reshaping of the borrow pit - Fencing off the borrow pit site will result in lost sense of land ownership amongst residents who live nearby - Current practice of stockpiling white dust/ sludge has an adverse visual impact from the skies. The proposed extension of the current borrow pit/ proposed dust disposal site during the reshaping exercise will equally have the impact of changing the general landscape of the site	- Ensure that marble/ granite dust temporarily stored on site is not piled up into heaps higher than the perimeter wall. This will eliminate visual impact from the B2 road - Implement the proposed alternating layering disposal method at the proposed dust disposal site, & ultimately place a topsoil cover during decommissioning phase to prevent having a white patch in the land scape due to exposed marble/ granite offcuts or dust - Minimize the spatial extent of disturbed footprint at any given time by limiting cleared ground which is required for widening the current access track or the proposed boundaries of the proposed disposal site - Maintain one access road to and from the stone processing site and the proposed marble/	- Annual site wide evaluation on the effectiveness of layered disposal method - Evidence for surface exposure of any white dust at the proposed dust disposal site after placement & levelling of topsoil over the site; by means of photographs	-Production Site Manager (holds overall responsibility) - Town council – Environmental Management Section	- Funds for reshaping the proposed dust disposal site -Earthmoving plant	-Ongoing throughout the operational phase of the proposed dust disposal site

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		granite dust disposal site to minimize footprint of disturbed ground				
Vegetation	- Limited removal of vegetation during widening of access road & expansion plus reshaping of the proposed dust disposal site. Impact likely small as the concerned areas are already heavily disturbed - Possible limited disturbance of vegetation/ habitats by excessive dust during earthworks. Impact likely small as the concerned areas are already heavily disturbed.	- Minimize disturbed footprint as much as practically possible -Restrict movement of vehicle and machinery to existing roads and tracks to prevent unnecessary damage to vegetation -Draft a restoration plan for the proposed dust disposal site, with input from a botanist who is familiar with the vegetation landscape of the area	-Monitor the following parameters post reclamation & rehabilitation of the proposed dust disposal site: vegetation re-establishment over the site; % vegetative cover; vertical structure of vegetation; plant health; richness and abundance of indicator species; type and extent of erosion; presence and extent of invasive alien plants	-Production Site Manager (holds overall responsibility) -Environmental Health and Safety Officer	-Funds for flora restoration program at the proposed dust disposal site -Technical Consultants to help with monitoring restoration progress	-Ongoing throughout the operation of the proposed dust disposal site
	-Solid waste pollution due to littering and storage of domestic and industrial (scrap metal, empty containers, waste wood, used tyres, waste concrete &	- Office & domestic waste is currently collected by the Town council & disposed off at the municipal dump site. This practice will continue - Scrap metals, used tyres, used containers & used oils/ grease &	- Site wide evaluation of the general condition of all waste storage sites must be conducted as part of the bi-annual environmental audits	- Production Site Manager - Environmental Health and Safety Officer	-Funds to acquire waste storage bins/ drums; move & store waste; to acquire waste moving machinery	Ongoing throughout the life of the processing facility & the proposed disposal site

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
Waste Management	construction) waste at the stone processing plant & at the proposed dust disposal site -Solid waste pollution due to stockpiling & spreading of waste stone break-offs & marble/ granite sludge or dust at the stone processing facility -Waste pollution due to usage & on-site storage of used oils, grease, lubricants, resin, & process plant - A large proportion of the stone break-offs are bagged in 1 ton bags & exported to overseas markets where they are re-processed to produce artificial slabs	lubricants are currently collected from the stone processing facility by a local contractor/ off-taker. This practice will continue - Waste wood is usually stockpiled & collected together with domestic & office refuse by the Town Council. This practice will continue - Process water from the stone processing facility is recycled & reused in the stone cutting & polishing sections. This practice will continue - This EMRP recommends that going forward wet slurry must first be pumped from the sedimentation dams onto a gently sloping concrete lined pad (fitted with cross cutting vertical fine filter nets) to facilitate water drainage to a lower point from where it can be pumped back into the process for reuse. As an alternative technology which might be more costly from an operational perspective the pumped wet slurry may go via a filter press system before being deposited onto the concrete lined pad in order to maximize water recovery. The relatively dry/	- A register of all waste generated on site is kept on either sites - All waste disposal agreements & permits are available on site - Monitor soil chemistry & quality once a year around the proposed dust disposal site to assess if the chemistry changes with time - Monitor process water quality - All access roads have an surfacing layer of crushed aggregates	- The Karibib Town Council (needs to drive & enforce the proposed measures)	-Funds to hire an independent environmental consultant to conduct bi-annual environmental audits - Funds to crush stone breakoffs and spread those over all access roads - Funds for researching economic and social viability of other marble/ dust waste management options	

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		slight moist slurry shall then be scooped up onto tipper trucks for trucking to the proposed marble/ granite waste dump site where it will be deposited in alternating layers with natural soils -A record of all waste generated at the processing facility & disposed off at the proposed dust disposal site shall be kept on site. Such record shall show daily records of quantity of slurry/ dust received/ dumped and a report shall be submitted bi-annually as part of the bi-annual environmental reporting -Used tyres may also be painted in reflective colours & used to mark the edges of roads, bends s - The broken marble/ granite slabs and break-offs that do not qualify to be bagged and exported, & once all requirements for placement of a marble/ granite aggregate wearing course on all access roads have been met, should be collected by the municipality &				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		provided free of charge to dedicated locals (appointed through a transparent bid process) who specialise in tiling works to further beneficiate such breakoffs into usable tiling products. The Town Council shall then have the mandate & responsibility of security off-takers for such products by making it mandatory that property developers who seek public private partnerships with the Karibib Town council buy tiles from those locals -Waste separation at source will be enforced by availing clearly labelled or differently coloured general waste (paper, plastic, organic waste) rubbish bins at all both the stone processing facility & the proposed dust disposal site. These must be emptied weekly at the municipal waste dumpsite -All hazardous waste such as oil drums, resin and grease should be stored in secure demarcated off and overhead covered areas. Such areas must also have a				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		concrete floor for spillage containment purposes. - Some of the stone offcuts or breakoffs must be crushed to 9 to 13mm aggregates and placed over all access roads as wearing/ surfacing layer to help suppress dust & to make slippery gravel roads safer during the wet seasons - In the long-term once the proposed abandoned pit has been filled to capacity it is recommended that the below waste management options be considered & explored jointly by MArmorwerke Karibib & the Karibib Town Council (note that for this concepts to materialise, the necessary research & engagement work needs to start as soon as possible): o If dust disposal proves to be the preferred option going forward then a designated portion of the proposed municipal waste landfill site must be availed to natural				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		stone operators with quarries outside a 10 km from the town for dust disposal. Such portion on the landfill shall have a raised starter wall not shorter than 10 m to ensure impoundment of the dust & shall at all times be managed to maintain a freeboard of about 1.5 m. Such paddock on the main landfill shall be fitted with decant & penstock system as well as return water dams to maximize water recovery from wet slurry as detailed under the practical recommendations section at the end of this report. The various natural stone processing operators may each pump water for reuse at their plants by using bowsers. Based on a visual judgement of the marble/ granite dust generated over a year during OMAVI's site visit & assuming the pit will be reshaped & graded				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		to have a depth of approximately 3 - 4 m below NGL, it is anticipated that once the proposed abandoned pit will provide storage capacity for approximately over 2 years, subject to all measures being implemented (such as bucket compaction, placement of think – approximately 150mm thickness of natural soil after each layer of dust, installation of a run off diversion ditch around the abandoned pit, installation & maintenance of a underdrain network with decant from which return water can be pumped). If it happens that the proposed pit fills up to capacity before a long-term dust management solution (e.g. disposal at municipal landfill vs. reuse and recycling) has been found and				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		agreed upon,, then consideration may be made to raise the proposed waste pit above NGL subject to the following specific due diligence/ feasibility actions & studies being undertaken: ▪ Construct a starter impoundment wall with suitable material using downstream tailings dam construction method ▪ Assess the stability of side slopes during design & operation ▪ Assess risk for overtopping, dam failure or breach, water management during extreme events				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		○ If dust disposal is out-ruled by other forms of waste management such as reuse & recycling as a long terms solution to the issue of managing the natural stone waste then the following work needs to start immediately to prove feasibility of such options: (1) Marmorwerke Karibib should explore the economic feasibility of having separate streams for marble & granite to ensure that the slurry wastes are not mixed. This will ensure production of pure marble dust for which there has been interested potential off-takers. (2) conduct the necessary physical laboratory test work (to probe for impact on workability, compressive strengths, flexural strengths, resistance to chemical attack) on the dust to access suitability				

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		of using the current dust as admixture in portland cement, concrete, brick & paver making. If the test results prove viability for re-use options should be jointly explored by the natural stone processors & the town council management to approach local cement producing and brick companies to conduct cost-benefit analysis on the possibility of sourcing the dust from the Karibib plant via railway for possible blending and/ or re-use or as a substitute for limestone clinker in cement; as binder in construction of non-load bearing structures; in brick & paver making; .				
	-Dust generated from bulk excavation works, current permanent stockpiling and	-Apply a thin (150 – 300 mm thickness) layer of crushed marble aggregates as cover on access roads to minimize dust generation	-Monthly dust level monitoring by installing dust buckets around the stone processing facility,	- Environmental Health and Safety Officer	-Funds to implement the dust and air quality monitoring program, including the bi-annual	Ongoing throughout the life of the operations

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
Air Quality	storage of fine marble/ granite dust on the stone processing site within town, from the planned waste haulage access road, and the planned disposal of dust at the proposed dust waste disposal site - Production of gaseous substances from burning of diesel from running mobile machinery	- Transport the marble/ granite silty clayey dust from the processing site to the disposal site in a slightly moist state after temporary drying on a sloping concrete lined pad - Cover vehicles carrying dusty materials to prevent materials being blown from the vehicles - Strictly enforce speed limits to approximately 30 – 40 km/hr to minimize the creation of fugitive dust within the project boundary - Avoid vehicles from idling and keep vehicles well maintained to minimize particulate and gaseous emissions - As is the current practice continue using a wet cutting and polishing process in the stone processing plant to minimize dust generation - Where drilling of blocks is required to downsize blocks at the processing site, the drill must be fitted with dust capture equipment	along the proposed access route and around the proposed waste disposal site - Continuous monitoring for ambient dust/ particulate (PM10 and PM2.5), bi-annually -All employees must do a mandatory health check every 6 months to monitor impact on their respiratory systems. Keep statistics of such results		personnel health checks -Technical Specialists (Air quality)	

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		-Reduction in unnecessary traffic volumes within the project area; - Deposit the dust in alternating layers with more coarse (sandy gravels) natural soils to prevent prolonged surface exposure of dust at the proposed waste site -All personnel onsite to wear appropriate PPE - Install a high brickwall around the stone processing facility				
Noise Pollution	-Increased nuisance due to increased noise levels along the proposed waste haulage route and the disposal site, as well as during the planned excavation works and movement of trucks	- During the construction (i.e. widening of proposed waste haulage road and reshaping of borrow pit), when the intensity of works is anticipated to be variable, monthly noise surveys will be undertaken at the receptors closest to the active work areas. Each receptor will be monitored for a period not less than 24 hours and the results compared with the threshold values stipulated under the relevant SABS standard	- Measured levels will be recorded in a log and checked for compliance with the evaluation criteria stipulated under appropriate standards such as SABS or BS 5228	- Environmental Health and Safety Officer	-Funds to implement the noise monitoring program, including purchasing of simple monitoring equipment -Technical Specialists (noise, where necessary as warranted by intensity of public complains or the monitoring results)	Ongoing throughout the life of the operations

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		-Project employees will be trained to operate a sound level meter and how to undertake reliable environmental noise measurements, especially within the premises of the processing site. -A communications plan will be Enacted jointly by Marmorwerke Karibib and the Town Council to communicate the commencement of the planned activities.				
Surface Water Resources	- Possible pollution of runoff water and small streams through hydrocarbon spillages in runoff areas resulting in reduced water quality - Possible compromise in the	- Install and maintain efficient oil and grease traps or sumps at refuelling above-ground fuel storage tank, workshops, and containment areas, and making spill kits available with emergency response plans	-Implement monthly surface water quality monitoring by sampling from any open water bodies in the vicinity of the processing facility and the proposed marble/ granite waste disposal	- Environmental Health and Safety Officer - Karibib Town Council	-Funds to implement the monitoring program -Technical Specialists (Water Specialist)	Ongoing throughout the life of the operations

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
	physical quality (e.g. turbidity) of runoff in the vicinity of the stone processing site due to erosion of currently stockpiled and spread marble/ granite dust	- All areas where refuelling and/ or usage of resin or grease is applied must be concrete lined -Attenuate surface runoff by using on-site storage and water management infrastructure (e.g. storage sumps, low gradient ditches, clean water diversion ditches) around the stone processing site as well as around the planned marble/ granite waste disposal site -Divert clean water from all active sites through construction of gently sloping diversion ditches	site. Target levels to comply with the Karibib Town Council's effluent targets or any other similar local standards			
Groundwater Resources and use	- Possible pollution of groundwater resources through seepage of spilled hydrocarbons & resin	- Implement bi-monthly groundwater monitoring by sampling water for standards quality control testing from local private/ municipal boreholes located within 500 m of the stone processing facility and the	-Implement monthly surface water quality monitoring. Target levels to comply with baseline water quality	- Environmental Health and Safety Officer - Karibib Town Council	-Funds to implement the monitoring program -Technical Specialists (Water Specialist)	Ongoing throughout the life of the operation

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		proposed marble/ granite dust disposal site - **To prevent excessive seepage of process water from marble/granite sludge in the in situ soils, a low permeability layer (with a hydraulic conductivity in the order of 10-08 to 10-7 m/s) of compacted material must be placed at the bottom and along the slopes of the facility during the reshaping exercise.**				
Occupational Health and Safety	-Short to Long-term safety effects -Short to Long-term health effects from dust and noise	-Proponent must avail adequate and appropriate PPE to all workers and visitors -Timeously recording and reporting of all health and safety incidences, together with actions taken & recommendations on mitigation measures going forward -Develop an MOU with the Local Healthcare Centres in Karibib for	-Regular health screening of workers -Bi-annual health and safety audits completed	- Plant Site Manager (holds overall responsibility) -Environmental Health and Safety Officer	-Funds to acquire health and safety related equipment; and to pay for employee medical services -First Aid training for at least 2 personnel at each work site	Ongoing throughout the life of the operations

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
		service provision to the local workforce -Enforcement of speed limits and sanctions for any personnel found in violation of speed limits, including senior staff and contractors' and sub-contractors' employees -Appropriate signalling of moving heavy machinery -All drivers to be given safety education focussing on speed and conflicts between pedestrians, rail traffic and animals -Proper screening of appointed security personnel to ensure they were not implicated in human rights abuses in the past - Enforce controlled access to the proposed marble/ granite waste disposal site to minimize public exposure to dust, safety risks, etc				
Security of the sites (the processing plant facility and the proposed marble/ granite waste disposal site)	-Security threats to personnel at the stone processing facility and the planned waste disposal site due to presence of valuable goods on site and	-Appoint a security company to safeguard entrance to the sites -Install flood light at the sites to facilitate visibility during the night. For the proposed marble/ granite	-Record and report (timeously) all theft, injury related incidences	-Plant Site Manager (holds overall responsibility) - SHE officer	-Funds to procure security services & equipment	Ongoing throughout the life of the operation

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
	possible loss of land access rights at the processing site and proposed waste dump site, respectively.	waste disposal facility such lighting must face away from nearby residences				
Public Disputes/ Grievances	-Risk of compromised relationships between Project owners and the general public	-Have a complaints logbook. Monitor community grievances and provide feedback timeously	Monitor community grievances and provide feedback	-Plant Site Manager (holds overall responsibility) - SHE Officer - PRO	-	Ongoing throughout the life of the operation
POSITIVE IMPACTS						
Continuation of Employment and	-Employment opportunities for youth from Karibib & surrounding areas -Transfer of technical skills in the natural stone processing industry	-Regular and accessible (transparent) dissemination of the human resources and employment policy to interested and affected communities -Complaints of inequality and discrimination in job selection and in jobs	-For every key job occupied by a foreign national evaluate skills learned by local under-study at the end of each production year	-Plant Site Manager (holds overall responsibility) -Public Relations Officer	-On the job training resources	Ongoing throughout the life of the operation

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
acquisition of technical skills		-Ensure that every job occupied by a foreign national has a local under-study to ensure on the job training of the under-study				
Local Empowerment and Procurement Opportunities	- Continuation & possible new opportunities for empowerment of local SME contractors through sub-contract work relating to security services, cleaning services, block & final product transportation, sourcing of diesel, off take agreements for some waste (e.g., waste wood, used oil/ grease/ lubricants, scrap metals and used tyres) -Opportunities for local companies to procure support services such as cleaning, marketing, cooking, canteen	-Procure support services (cleaning, machinery maintenance, security and product transportation services from local previously disadvantaged contractors) - Evaluate proportion of annual procurement budget spent on contract works and supply of goods by local SMEs or local businesses	-Every 6 months review contracts awarded for support services to assess extent of local previously disadvantaged contractors	-Plant Site Manager (holds overall responsibility) -Public Relations Officer - Karibib Town Council	- Annual procurement budget that is reserved for local businesses	Ongoing throughout the life of the operations

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
	services, and supply of spares					
Continuation of benefits & generation of possible new benefits to Town Council	- Continuation of financial benefits to the Town through payment of rates & taxes, water bills, support to social programs - The proposed reclamation of the abandoned borrow pit by Marmorwerke Karibib will assist the Town Council in overcoming challenges with having an open pit that posses a significant risk to its residents - Considering the fact that the proposed disposal of granite/ marble dust or sludge at the abandoned pit is a temporary solution which was jointly agreed with the	- The project proponent must support municipal developmental initiatives such as availing technical knowhow and possibly lead fund-rising initiatives that will contribute towards acquiring sufficient funding to jointly develop and maintain the proposed municipal waste landfill site - Considering that the town council has so far been approached by approximately 6 other potential players in the dimension stone processing industry, it is strongly recommended as a matter of urgency that management of the Town Council calls for joint workshop with both current and potential developers of natural stone processing facilities (and possibly environmental consultants) to deliberate and explore options for natural stone dust and sludge waste management going forward. It is strongly recommended that amongst solution options to be	-Evaluate proportion of annual budgets spent on supporting municipal developmental initiatives when conducting bi-annual environmental audits	-Plant Site Manager (holds overall responsibility)	- Annual budget to support socio-economic initiatives	Annually

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
	Town Council to help rehabilitate the pit & simultaneously solve the issue of excess dust generation from the processing facility, the continuation of operations of the Marmorwerke Karibib Processing facility will inevitably force the proponent to contribute funds towards the construction and maintenance of the proposed municipal landfill site to ensure long term and sustainable safe disposal and management of the granite/ marble dust waste.	deliberated on in such forum is to conduct the necessary laboratory test work on such waste that would justify other means of managing such waste. Such means should look at for instance				
Revenue for Government	-Revenue collection for government through various forms of taxes and export duties from sale of blocks and finished products	-The proponent must pay all relevant taxes applicable under the constitution of the Republic of Namibia	- Evaluate taxes & other fees paid to government when conducting the bi-annual environmental audits	-Plant Site Manager (holds overall responsibility)	-	Ongoing throughout the life of the operation

Aspect	Impact	Mitigation / Enhancement Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources Required	Timeframe of management action(s)
	- Indirect financial benefits to organs of state such as Namwater, Nampower/ Erongo red, Namport through payment of water, electricity, product storage & shipping services	- The proponent must pay their water & electricity bills				
EMRP implementation and training	Lack of EMRP awareness, limited understanding of the measures set out in the EMRP, and implications thereof	An EMRP non-compliance penalty system should be developed & implemented on site. Awareness of this must be made to all employees & must form part of induction process - The Proponent should appoint an SHE Officer to be responsible for managing the EMRP implementation and monitoring.	All required Plans or Procedures and systems are developed and are in place Safety, Health and Environmental (SHE) Officer is appointed & held accountable for any oversight of key measures presented in the EMRP	- Plant Site Manager - SHE & PRO - The Karibib Town Council (Environmental Department) - The general community	Records of EMRP implementation Plans and Systems Allocation of annual budget to support implementation of the EMRP	Throughout the life span of the operation

10 MONITORING AND REPORTING PROGRAMS

Monitoring of environmental issues shall place throughout the period of operation. Marmorwerke Karibib welcomes the Department of Environmental and Forestry Affairs (DEFA) to inspect the concerned sites after the renewal of the ECC to ensure that all the information provided in this document are correct and that all the proposed impact mitigation and enhancement measures are being complied with. The DEFA will receive a report concerning environmental matters on a bi-annual basis.

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

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

The following monitoring tools/ techniques are recommended for this project going forward:

- **PHOTOGRAPHS** must be used to provide evidence and verify compliance with respect to the following aspects:
    - Confirm slope stability of side slopes for the proposed marble/ granite waste disposal pit;
    - Provision for runoff diversion ditches onsite;
    - Provision for dust and noise suppression facilities, e.g., condition of access roads;
    - Conditions of all access roads and evidence of the recommended surface wearing course of crushed aggregates;
    - Conditions of the water recovery dams, the proposed inclined concrete lined pad for facilitating drying/ drainage of marble/ granite sludge;
    - Provision of site signboards that are erected at the disposal site to warn the public not to enter the facility as well as along the waste haulage road to warn traffic operators;

- Changes to the landscape of the area;
- Proper waste management practice onsite, e.g. provision for waste collection bins, general site conditions at the working areas, site office, storage area, workshop, sewage facilities, temporary storage of all waste disposed off through offtake arrangements and others;
- Proper block and final products transportation management including utilisation of approved routes, allowable vehicles load and other;
- Evidence for widened access road, fencing of the disposal site, layered deposition of the marble/ granite waste, installation of a low permeability compacted layer at the bottom and along the side slopes of the pit prior to waste disposal, creation of new tracks due to non-compliance

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

- **PERIODIC FIELD CHECKS** must be carried out during site preparation and operations in order to ensure compliance with the following mitigation measures:
  - Conditions of waste disposal pit slopes;
  - Validity of all operating permits such as the ECC, etc;
  - Improved working practices/ management procedures at all work sites;
  - Layered disposal of the marble/ granite dust waste;
  - Landscaping works post rehabilitation;
  - Compliance to provision of appropriate and adequate PPE;
  - Compliance to recommended safe practice such as holding daily safety meetings and conducting daily inspections on vehicles and plant;
  - Compliance to reporting of all safety, health and environmental incidences through inspection of safety books;
  - Proper waste handling at all working areas;
  - Visual inspection for general cleanliness and good management practices within the site;
  - Effectiveness of dust and noise suppression measures
- **RECORDS** of activities to ensure compliance with the following mitigation measures:
  - Record of all communication to the general public of the closure of the current abandoned borrow pit site prior to commencement of any waste disposal works;
  - Record of all safety, health and environmental incidences;
  - Maintenance of erosion control facilities;
  - Daily working hours;

  - Daily inspection logs for all vehicles and plant;
  - Records of any complains launched concerning the activities;
  - Whether data records being collected for monitoring purposes are actually being utilized by the proponent to assess trends and continuously improve on the recommended impact management and mitigation measures;
- **MAPS/ LAYOUT PLANS** to indicate locations of key structures and all monitoring tools or instruments being utilized during the operational phase. Such layout plans should encompass the following:
  - Boundary fence (if any) of the abandoned borrow pit site, including access gates;
  - Waste haulage route;
  - Haul and access roads;
  - Drainage diversion channels;
  - As-built layout of the stone processing facility and all associated structures;
  - As-built positions for all dust fallout stations;
- **AIR QUALITY MONITORING:** at least three (3) dust fall out monitoring stations should be installed at 120^{o} angle covering upwind & downwind directions around both the stone processing facility and the proposed marble/ granite dust waste pit.
- **SURFACE WATER MONITORING:** Monitoring of surface water (in drainage channels) at upstream and downstream is necessary at least twice in a year (i.e. pre-monsoon and post-monsoon). It is recommended that the surface water samples should be analysed for pH, EC, Turbidity, SS, TDS, Total Alkalinity and Total hardness.

11 CLOSURE AND DECOMMISSIONING

11.1 Context and Background

In the context of this report the closure and decommissioning phase is mainly concerned with the proposed new marble/ granite waste disposal site and the waste haulage road, and does not concern the processing facility as much because the latter is currently expected to be a lifetime operation.

For this project the decommissioning phase refers to the cessation of all marble and granite waste disposal activities at the abandoned borrow pit (or the proposed marble/ granite waste disposal) site as well as the removal and/ or rehabilitation of any support infrastructure associated with that activity.

The objectives of the closure and decommissioning phase for this project are to:

- Provide a safe, stable and beneficial use landform after termination of all waste disposal activities;
- Comply with generic relevant regulatory requirements and attain regulatory consensus on the successful closure and rehabilitation of the site. Currently, Namibia does not have its own regulations or standards for the closure and rehabilitation of mine waste disposal site, but there are other relevant guidelines that could be drown from. These include:
    - Best Practice Guidelines for Care and Maintenance, Closure and Completion developed by the Namibian Chamber of Environment in 2019
    - Guidelines for Preparing Mine Closure Plans of 2015 developed by the Department of Mines and Petroleum of Western Australia
- Complete the closure, decommissioning and rehabilitation works during and after operations, and in a cost effective manner as much as possible whilst achieving the primary socio-economic and developmental objectives of the project.
- Produce a final "walk away" landform that is stable and that blends aesthetically into the surrounding landscape, yet as far as possible does not impend possible future land uses.

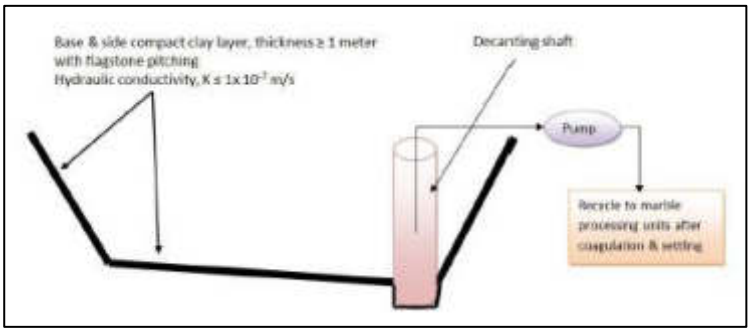
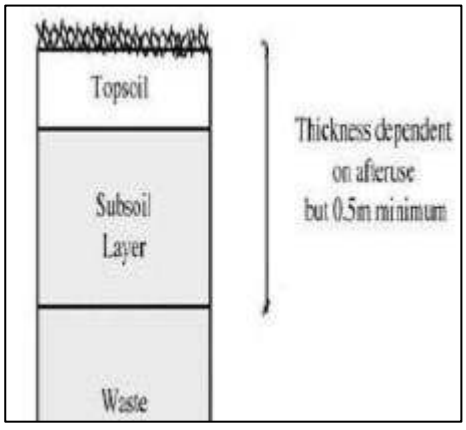
11.2 Site Reclamation & Rehabilitation

The following actions or practices are proposed to ensure that the marble/ granite waste disposal site and the waste haulage road are restored and rehabilitated to acceptable levels. The recommended design and construction methods for the proposed temporary marble/ granite dust disposal facility are also provided here.

Table 11-1 provides the rehabilitation and closure measures to be implemented at closure of marble/ granite waste disposal site and the waste haulage road to meet the requirements of the Environmental Management Act.

Table 11-1. Recommended Rehabilitation Measures

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
Site preparation, reshaping & Construction considerations	- The current pit must be reshaped and levelled. This shall include: reshaping the pit to give it straight edges, battering the side slopes to at least 1V in 3.5H, excavating to 3-4 m depth, levelling the basin's base to slope towards concrete ring decant; placement along the base & side slopes of a compacted natural clay or in situ soil/ bentonite mixture layer with a thickness not less than 500 mm & a final hydraulic conductivity of k < 10^{-7} m/s as shown in sketch below; laying out of a network of interconnected undrain perforated PVC pipes, sloping towards the ring	- Existing pit has been reshaped, graded, clay layer & underdrain placed – Photographic record present

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	concrete decant shaft for water recovery; Installation of perimeter wire fence and lockable gate 	- Site has been surveyed, perhaps for free by the Town Council Survey department - Fence & lockable gates installed
Revegetation	-All surface infrastructure areas (fence, access control room, return water pond) affected by the project will be re-vegetated using local plant species. The following revegetation measures will be implemented over the disturbed site: Prepare surface rehabilitation areas for the natural establishment of vegetation by undertaking the following: • Rip disturbed footprint to a depth of approximately 500 mm with suitable agricultural equipment to alleviate compaction; • For areas that are heavily compacted (access roads), rip with construction equipment to a depth of at least 1 m, and over-rip with agricultural equipment in order to create suitable conditions for vegetation establishment; spread a layer of subsoil & stockpiled topsoil as per sketch below; and ameliorate soils as required.  • Allow for natural establishment of a viable self-sustaining vegetation community, in keeping with the surrounding natural environment, or establish pioneer vegetation species as per findings of dedicated rehabilitation trials to be run from the start of the project; and	- Exotic weed species are not observed to be elevated in abundance when compare to the regional setting as reported by a trained independent botanist -Monitoring sites are established on site and surrounding sites (at least four representative control sites). Flora species diversity in rehabilitated areas are representative of control sites. Vegetation density of monitoring sites are at least 80% when compared to the average of the control sites.

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	• Undertake vegetation monitoring (including % recovery of un-revegetated sites) post closure to ensure rehabilitation success	
Contaminated Soils	-Undertake a site-wide contaminated soil assessment to determine the nature and extent of contamination, the sources of contamination and to identify appropriate remediation measures; -Rehabilitate moderately contaminated (inorganically contaminated) soils as follows: • Excavate contaminated material to a depth of 300 mm and remove and dispose of at closest approved landfill sites. - Rehabilitate moderately contaminated (organically contaminated) soils as follows: • Treat organic contamination by means of biological remediation via the establishment of a bioremediation site and monitor soil quality against a selected control site.	-Inorganically contaminated soils are safely disposed off at closest approved Landfill, subject to granting of relevant permits -Organically contaminated soils are effectively treated and compositions are restored to acceptable levels once compared with control sites
Surface Infrastructure and Equipment	**<u>Infrastructure for Potential Beneficial re-use</u>** • Compile an inventory of infrastructure and equipment to potentially remain at closure, aligning to end land use plan; • Obtain legal authorisations from Karibib Town Council for infrastructure to remain and to be transferred; and • Finalise agreements with third parties, along with transfer schedule **<u>Surface infrastructure to be removed</u>** • Remove all assets/equipment that can be profitably removed for salvage or resale; • Dismantle/demolish infrastructure; • Demolish and excavate concrete foundations to 1 m below ground level. Alternatively and in appropriate instances the concrete slabs of "clean" infrastructure (not processing infrastructure) can be covered with a 1 000 mm soil cover as part of site re-profiling and integrated into the surrounding topography; • Backfill excavations of disturbed infrastructure footprint areas through a cut to fill action; • Shape and profile the disturbed surface areas to match surrounding topography and to ensure free drainage, thus limiting run-off erosion;	-Formal transfer of ownership and liability of specific infrastructure -Independent sign-off by a qualified engineer confirming the safe and stable condition of all transferred infrastructure -All other infrastructure decommissioned to ground level and removed from site

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	• Stabilise disturbed areas to prevent erosion and sediment mobilisation in the short to medium term until a suitable vegetation cover has been established; • Rip disturbed footprint to a depth of approximately 500 mm with suitable agricultural equipment to alleviate compaction; and • Establish vegetation species that mimic the surrounding flora by collecting seed from pristine bush and shrub land and actively planting before the wet season **Measures relating to support Infrastructure** • Obtain legal authorisations for infrastructure to remain and to be transferred; • In addition Identify and donate equipment to town council that can be reused and/or recycled • Dismantle the remaining overland pipes, decants and salvage as much as possible; • Seal open ends of buried pipelines and fully cover with nothing exposed **Measures relating to transport Infrastructure** • Agreements will be put in place between the proponent and the town council as well as other relevant authorities as to which roads shall remain post closure for beneficial use by farmers. -Roads that will no longer be used post closure will be rehabilitated as follows: • Re-establish natural drainage, including the removal of culverts and/or trenching; • Profile to be free draining and emulating the natural surface topography; • Rip access roads to a depth of approximately 300 mm with suitable agricultural equipment to alleviate compaction; and • Establish vegetation species that mimic the surrounding shrub/ bushland by collecting seeds from pristine surroundings and actively planting before the wet season **Measures relating to Electrical Infrastructure** • Remove flash flood lights offsite and demolish concrete bases; **Measures relating to crusher plant and Mobile Machinery/ Vehicles** Machinery and Vehicles • Identify equipment that can be reused and/or recycled that will not be salvaged;	
Above Ground Openings (diversion ditches)	• Place topsoil over the backfilled area; • Shape footprint area to be free-draining (aligned to site-wide routing); • Rip area to alleviate compaction; and	

ENVIRONMENTAL ASPECT	REHABILITATION ACTIONS	COMPLETION CRITERIA
	• Establish vegetation	
Surface water	Surface monitoring must continue to be undertaken post closure to ensure that mining effluents meet the regulatory requirements. The following actions are to be undertaken: <u>For Surface Water</u> • Monthly monitoring of surface water sites for quality – for at least 5 years post closure or until site relinquishment criteria have been achieved; and • Conduct biomonitoring at selected downstream sites for at least 5 years or until site relinquishment criteria have been achieved.	-Water samples taken from sampling points downstream of the site are within the National effluent quality specifications for a 12-month period
Cover system	• After deposition of final lift of marble/ granite dust a cover system must be installed. Such cover system should include a 250 mm thick layer of subsoil spread across the entire site, and that should be overlain by another 250 mm layer of top soil	- subsoil & topsoil placed and spread across the site

12 CONCLUSIONS

12.1 Summary

It is recognized internationally that dimension stone processing operations exhibit low environmental impacts compared to conventional processing of metallic mineral resources, largely because of the nearly physical treatment process involved for the former. However, the author also acknowledges that this industry (i.e., dimension stone processing) can have significant detrimental impacts particularly arising from the excessive generation of dust due to the fine (silt and clay sized) particles generated during the block cutting process. In the case of marble, the dust has further adverse visual impacts when it is stored in an area where marble is a foreign material because the prominent white colour typically stands out.

Based on the above review of the ongoing and planned operations in Karibib, the laboratory test results provided, the likely impacts from the current and planned operations, and the proposed impact management measures it is concluded that the marble and granite processing operations by Marmorwerke Karibib currently generates unacceptable levels of dust in town due to storage of such dust on the processing premises. Excessive dust is particularly generated from areas where it is exposed to moving traffic such as at the block offloading bay. Apart from the issue of excess dust and its compromise on both air quality and visual deterioration, the majority of the other impacts are generally insignificant and should be manageable upon stringent implementation of the impact management actions presented

in this report. It is envisaged that with the newly erected 4 m high perimeter boundary wall and the proposed trucking, and subsequent controlled and layered disposal of the marble/ granite dust material at the proposed waste disposal site this issue will be addressed upon the implementation of the proposed dust waste management strategy outlijned in this document.

12.2 Closing Remarks

The aim of this report was to review the current operations of the Marmorwerke Karibib marble/ granite processing facility; present the proposed amendments to the scope of activities that are to be covered under the new ECC; review the current conditions of the environment surrounding the facility and assess how those would be affected by the continuation of current operations and the introduction of the new additional activities proposed; consolidate issues raised by stakeholders; and formulate pragmatic impact management actions with allocated clear roles and responsibilities to ensure that the Marmorwerke Karibib dimension stone processing facility continues to operate in an environmental friendly manner.

The public and directly affected stakeholders were consulted. The public was informed via published advertisements in three local newspapers; site/public notices placed in the project area; a public consultation meeting held in January 2022 at the Karibib Community Hall; as well as via e-mail communications to identified and registered I&APs. No significant issues of merit were raised during the public consultation process but the minor concerns raised have nonetheless been incorporated herein.

Overall, due to the already highly disturbed nature of the affected areas, and the fact that the operation has been in existence for a while the potential environmental and soci0-economic changes are largely limited.

Based on this and the projected residual risks that remain from the impacts identified after implementing proposed mitigation measures, it is recommended that an Environmental Clearance Certificate can be issued; subject to the implementation of the impact management and monitoring measures outlined in this report.

13 REFERENCES LIST

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APPENDIX A – APPLICATIONS FOR ECC RENEWAL AND OWNERSHIP TRANSFER FORM_MOTIVATION FOR ECC OWNERSHIP CHANGE_BACKGROUND INFORMATION DOCUMENT

ANNEXURE 1
FORMS

Form 1

App - 003444

REPUBLIC OF NAMIBIA

NAMIBIA REVENUE N$100 NAMIBIA REVENUE N$100

ENVIRONMENTAL MANAGEMENT ACT. 2007

(Section 32)

APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE

NAMIBIA REVENUE N$100

Revenue stamp

PART A: DETAILS OF APPLICANT

MINISTRY OF MINES AND ENERGY
MINING COMMISSIONER
2022 -01- 24
MC Private Bag 13297 9000 WINDHOEK
OFFICIAL

1. Name: (person or business)
   MARMORWERKE KARIBIB (PTY) LTD
2. Business registration/Identity No.
   Co Reg 82/082
3. Correspondence Address:
   P.O Box 4676, Walvis Bay, Erongo Region, Namibia
4. Name of Contact Person:
   L. Liebenberg
5. Position of Contact Person:
   SHE Officer - Project Proponent
6. Telephone No.:
   +264 81 478 6303
7. Fax No.:
   N/A
8. E-mail Address: if any
   enviro@omavi.com.na

ANNEXURE 1
FORMS

Form 1

REPUBLIC OF NAMIBIA

ENVIRONMENTAL MANAGEMENT ACT. 2007

(Section 32)

APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE

NAMIBIA REVENUE N$100

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Revenue stamp

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4. Name of Contact Person:
   L. Liebenberg
5. Position of Contact Person:
   SHE Officer - Project Proponent
6. Telephone No.:
   +264 81 478 6303
7. Fax No.:
   N/A
8. E-mail Address: if any
   enviro@omavi.com.na

PART B: SCOPE OF THE ENVIRONMENTAL CLEARANCE CERTIFICATE

1. **The Environmental Clearance Certificate (ECC) is for:**

   The continuation of full operations of the Existing Marmorwerke Karibib Stone Processing Facility and associated Reclamation/ Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands

2. Details of the activity(s) covered by the environmental clearance certificate:

   Title of Activity:

   RENEWAL of Environmental Clearance Certificate (ECC) for the continuation of Operations of the Existing Marmorwerke Karibib Stone Processing Facility and associated Reclamation/ Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands

   Nature of Activity:

   - Haulage and Delivery of Dimenstone Blocks to the Karibib Stone Processing Facility
   - Full operation of existing stone processing facility – Block sorting, cutting & polishing of blocks into slabs, table tops, mosaic & tiles
   - Packaging & Haulage of finished products to local and overseas markets
   - Temporary storage of non-toxic marble & granite dust/ sludge and stone offcuts on site
   - Haulage of non-toxic marble & granite dust/ sludge and stone offcuts from processing facility and subsequent controlled disposal at a fenced off abandoned borrow pit nearby
   - Reshaping of existing abandoned borrow pit prior to simultaneous disposal and reclamation
   - Reclamation & Rehabilitation of non-pristine abandoned borrow pit using combination of natural soils and non-toxic marble & granite dust/ sludge and stone offcuts
   - Creation of access road from stone processing facility to a fenced off abandoned borrow pit
   - Waste sorting on site
   - On site storage of factory equipment
   - On site maintenance of mechanic plant and equipment
   - On site accommodation of critical services personnel

   Existing Infrastructure and Equipment

- Approximately 14 000 m^2 primary block cutting, polishing & product storage plant for production of slabs, table tops, wall cladding stone with on roof solar system
- Approximately 9000m^2 of mosaic plant (for tiles) with on roof solar system
- Approximately 1100 m^2 office & show room block
- Approximately 820 m^2 of mechanical workshop
- Approximately 3700 m^2 of on site accommodation for critical services staff
- Block storage yard
- Concrete lined water recycling dams
- Marble & granite dust/ sludge and stone offcuts temporary storage bays
- Parking lots for vehicles and plant
- Storage bays for final products
- On site access roads
- An irregularly shaped abandoned borrow pit located north east of existing stone processing facility
- Perimeter boundary wall
- Various earthmoving, rock cutting and polishing equipment

New or Proposed infrastructure & activities

- Fencing & reshaping of the abandoned borrow pit
- Enlargement and formalisation of access gravel road leading from stone processing plant to the proposed abandoned borrow pit. This will facilitate disposal of marble & granite dust, sludge and small stone offcuts
- Top soil stockpiling and storage in side fenced off area
- Diversion of drainage channel from abandoned borrow pit

Location of Activity:

The Marmorwerke Karibib stone processing factory is located within the town of Karibib on the western boundary of the town and along the B2 national highway enroute the town of Usakos and Walvis Bay. The abandoned borrow pit, which is to be reclaimed with marble/ granite dust/ slightly moist sludge, is located about 1.5 km to the north of the town's CBD, along an existing gravel road leading to the town's oxidation ponds and the Karibib Military base. Therefore the project area lies in the Karibib Constituency, Erongo Region, Namibia

Project Location	
Combined site extent:	Approximately 11.5 Ha

<table>
<tr><td>Approximate Site corner coordinates:</td><td>Karibib Stone Processing Facility:
<table><tr><td>21.941283°S</td><td>15.844237°E</td></tr><tr><td>21.940310°S</td><td>15.843647°E</td></tr><tr><td>21.939003°S</td><td>15.843591°E</td></tr><tr><td>21.938800°S</td><td>15.844102°E</td></tr><tr><td>21.938947°S</td><td>15.845949°E</td></tr><tr><td>21.938320°S</td><td>15.847851°E</td></tr><tr><td>21.939278°S</td><td>15.848522°E</td></tr><tr><td>21.940493°S</td><td>15.846538°E</td></tr><tr><td>21.940692°S</td><td>15.845600°E</td></tr></table>
Abandoned Borrow Pit:
<table><tr><td>21.924895°S</td><td>15.850293°E</td></tr><tr><td>21.924314°S</td><td>15.851521°E</td></tr><tr><td>21.925216°S</td><td>15.851857°E</td></tr><tr><td>21.925648°S</td><td>15.851237°E</td></tr><tr><td>21.925346°S</td><td>15.850516°E</td></tr></table></td></tr>
<tr><td>Local Authority:</td><td>Karibib Town Council
Mr. Lesley Goreseb - CEO</td></tr>
<tr><td>Regional Authority:</td><td>Karibib constituency, Erongo Regional Council

Mrs. Melanie Ndjago – Hon. Councillor</td></tr>
</table>

Scale and Scope of Activity:

The proposed activity covers a combined area of approximately 11.5 Ha. This includes both the existing stone processing facility and the abandoned borrow pit that is to be reshared, fenced off and reclaimed.

Anticipated Environmental Impacts:

The obvious potential impacts of the quarrying operations are highlighted below.

Potential Positive Impacts:

- Continuation of Employment opportunities for locals and youth in Karibib & Erongo at large

- Contribution towards the sustained operation of the Karibib dimension stone processing facility, which is significant contributor to the local economy and social livelihoods in this town
- Sustained and increased revenue generation for shareholders; the Karibib Town Council + Namwater + Nampower through water, electricity and rate charges; and to the state through various types of taxes and export duties.
- Support to local businesses through the procurement of consumable items such as PPE, machinery spare parts, security, lubricants, mechanical maintenance, waste management and transportation of blocks and final products
- Skills development, transfer and consolidation for locals
- Reduction in dust generation and mobilization into the town
- Reclamation and rehabilitation of an abandoned borrow pit which could have remained an eye soar and a drowning hazard for children from the Karibib Town location
- Promotion of environmental compliance in the local dimension stone processing industry
- Generation of surplus solar energy which is sold to Nampower to supplement the grid
- Promotion of green energy in the local dimension stone industry
- Opportunities to explore other possible and value adding measures for managing dust and sludge generated from natural stone processing

Potential negative impacts identified:

- Marble & granite dust and sludge generation during stone processing and during haulage to the abandoned quarry
- Generation of solid (wood, scrap metal, marble & granite dust, stone offcuts, plastic) & liquid (used oils and grease) waste from the stone processing facility.

- Impact on vegetation and fauna: some vegetation may need to be removed during the widening of the existing haulage route between facility and abandoned borrow pit, as well as during reshaping of the abandoned borrow pit. This impact is not expected to be severe because the area is already disturbed.
- Noise generated by earth moving machinery and stone processing machines (jaw and blade cutters)
- Occupation health hazards (due to dust, noise, lifting operations, cutting equipment, heavy mobile plant, etc)
- Potential damage to subgrade due to traffic compaction along tracked/ haul access roads. This has the potential to increase surface runoff, especially were the topsoil is relatively cohesive
- Risk of illegal dumping of unauthorized waste at the abandoned borrow pit
- Risk of hydrocarbon spillages in the working areas and workshops if not properly managed
- Possible adverse socio-economic impacts include:
- Disputes between project proponent and town council or residents due to poor practices

PART C: DECLARATION BY APPLICANT

I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental clearance certificate may be suspended, amended or cancelled if any information given above is false, misleading, wrong or incomplete.

Signature of Applicant	L. Liebenberg Full name in Block Letters	Representative: Project Proponent Position
Marmorwerke Karibib (Pty) Ltd On behalf of	19 January 2022 Date	

Form 2

REPUBLIC OF NAMIBIA

ENVIRONMENTAL MANAGEMENT ACT, 2007

(Section 39)

APPLICATION FOR OWNERSHIP TRANSFER & AMENDMENT OF CONDITIONS OF ENVIRONMENTALCLEARANCE CERTIFICATE

A. PARTICULARS OF APPLICANT

Name of Applicant: **Marmorwerke Karibib (Pty) Ltd**

Address: **P.O Box 4676, Walvis Bay, Erongo Region, Namibia**

Tel. No.: **+264814786303**

Cell No.: **+264814786303**

Fax No.: **None**

E-mail: **enviro@omavi.com.na**

Name of Contact Person: **L. Liebenberg**

Tel No.: **+264814786303**

Cell No.: **+264814786303**

Fax No.: **None**

Email: **enviro@omavi.com.na**

B. PARTICULARS OF CURRENT ENVIRONMENTAL CLEARANCE CERTIFICATE

1. Name of current holder of Environmental Clearance Certificate: **Best Cheer Investments Namibia (Pty) Ltd**
2. Date of Issue of current Environmental Clearance Certificate: **26 April 2019**

PART C PROPOSED AMENDMENTS TO THE CONDITIONS IN CURRENT

1. Condition(s) on the Current Environmental Clearance Certificate:

- **Targets for improvements with regards to environmental performance should be established**
- **The Ministry of Environment, Forestry and Environment reserves the right to attach further legislative and regulatory conditions during the operational phase of the project.**
- **All relevant permits shall be obtained prior to the commencement of the proposed activities**
- **The Clearance Certificate 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 Best Cheer Investments Namibia (Pty) Ltd and their consultants.**
- **The Environmental clearance is valid for a period of three (3) years from the date of issue unless withdrawn by this office.**

2. Proposed Amendment(s)

- **The envisioned renewed Environmental Clearance Certificate (ECC) should be granted to the current operator, Marmorwerke Karibib (Pty) Ltd. Hence, there is a name change required**
- **The scope of activities for the operation should be extended to cover the following additional activities:**
    - **Widening an existing track leading from the current stone processing facility to a proposed abandoned borrow pit located on the northern outskirts of town. This will be used as a haulage route for waste marble/ granite dust & some stone breakoffs produced from the stone processing facility**
    - **Reshaping & fencing of an abandoned borrow pit located on the northern outskirts of town to permit controlled access, regular controlled deposition & safe storage of waste marble/ granite dust & some stone breakoffs produced from the stone processing facility**
    - **Controlled regular trucking, deposition & bucket compaction of waste marble/ granite dust & some stone breakoffs in alternating layers with natural soils & possibly some existing construction rubble at the proposed abandoned borrow pit up until the pit has filled up to the natural ground level**
    - **Ultimately, rehabilitation planning for the proposed waste marble/ granite dust & some stone breakoffs pit through the following:**
        - **Placement and spreading of topsoil borrowed from the surroundings over the reclaimed pit so that the final landform blends in with the surrounds**
        - **Removal of the access control fence**
        - **Surveying of the reclaimed/ rehabilitated pit area so that it is well demarcated for future use planning**
- **That waste marble/ granite dust shall only be stored on the stone processing facility's premises for a short while (maximum of 2 weeks) while it is being dried and drained on a concrete lined pad (as detailed in the accompanying EMRP report) before being trucked to the proposed dust disposal pit.**
- **Strictly implement a dust monitoring program for both the stone processing site as well as the proposed dust disposal pit sites.**

3. Reason for Amendment(s)

- **Waste marble/ granite dust produced from the cutting & polishing of blocks at the stone processing facility has always been stored on the same premises in the form of stockpile heaps which are subsequently spread out around the facility. Because the dust (or sludge as it is referred to when it is moist or wet) is fine grained, the solid particles (silt & clay sized) are easily mobilised into air when they are loose, and especially when wind blows and/ or when vehicles and earthmoving machinery**

drive over them. This usually creates excessive dust on site and in the immediate surrounding areas of town, and causes major nuisance and possibly long-term respiratory issues. Because of this, a need was identified to find suitable sites for the disposal and safe storage of such dust off the stone processing facility's premises and ideally in a relatively confined space away from places of business or residence.

- **The reason for the proposed change to the ECC holder's name is because there needs to be alignment between the current operator of the natural stone processing facility including all its associated operations AND the name that is reflected on the valid ECC**

4. Describe the environmental changes arising from the proposed amendment(s) AND Describe how the environment and the community might be affected by the proposed amendment(s):

:

- **The following changes are expected to occur on the respective environmental receptors:**
    - **Landscape** – the proposed widening of the current access track leading from the stone processing facility to the proposed waste dust site will involve surface clearing and will therefore create an additional scar to the landscape. Similarly, the proposed reshaping of the abandoned borrow pit will equally create a scar in the landscape during the reshaping & operational phases of this site. The latter scar is however expected to disappear to a reasonable extent once the pit has been filled and fully rehabilitated
    - **Air Quality** – dust generated from the movement of waste marble/ granite dust as well as during earthworks during the widening of the access road and reshaping of the pit may alter ambient dust and air quality levels. It is anticipated that disposing dust off site will improve ambient air quality in the town. Dust levels need to be monitored in this regard.
    - **Water recovery for re-use in the Plant** – The proposed temporary placement of wet sludge on a sloping concrete lined pad will facilitate water drainage from such material. Such water will collect in the lower portion of the pad & will be pumped back into the stone processing plant. This will increase the amount of water that is recovered from the sludge (as opposed to the current practice where water from wet sludge is allowed to drain into the ground and is lost) for reuse in the stone beneficiation process. Overall this will reduce intake of water from Namwater/ Municipality
    - **Soils** – soil structure and possibly quality is likely to be adverse impacted through traffic compaction & possible unexpected spillage of hydrocarbons during the waste haulage and deposition processes
    - **Lost sense of public space ownership** – the public currently views the abandoned borrowed pit as a publicly accessible open space which they use to source borrow material for domestic construction and sometimes for illegal dumping of garden & construction waste. Fencing it off and controlling access will result in a sense of lost ownership of the site and may trigger some tensions.
    - **Public health and safety** – the proposed disposal & storage of waste marble/ granite dust in a slightly moist state and into a confined space away from areas of residences and/ or business operations will de-risk compromise on public health due to reduced dust generation. The non-storage of dust on the processing site, and especially near block and product loading bays where trucks drive will improve visibility which in turn will make working in those areas safer. Additionally, there has been fatality incidences of children drowning in the abandoned borrow pit during the rainy season as the pit normally fills up with water. Controlled access to the pit and the planned reclamation will eliminate this risk.

- **Noise levels** – Because tipper trucks will be running regularly between the processing facility and the waste disposal site, ambient noise levels are expected to be altered. Noise levels are further expected to be changed by the occasional operation of a front end loader at the marble/ granite dust waste disposal pit as such equipment will be mobilized to site regularly for ground leveling, spreading disposed material, etc

- **Potential social benefits** – The widening of the access road, reshaping and fencing of the pit will be outsourced to competitive local contractors. This will create additional procurement and employment opportunities in the town. Joint management of the proposed waste marble/ granite pit with the Town Council will result in improved knowledge on the management of such waste which would in turn equip the town council's personnel to better handle similar type of waste when their new landfill site becomes operational

5. Describe how and to what extent the environmental performance requirements set out in the assessment report previously approved or activity profile previously submitted for this activity may be affected:

The previous EIA assessed the impacts of the proposed natural stone processing activities on the below factors. Hence, an independent review of how the environmental performance requirements set out previously with respect to each of these receptors are briefly highlighted below:

- **Fauna & Flora** – with respect to these receptors the previous assessment recommended that operators and drivers of vehicles and machinery should be accompanied by a Health and Safety office when conducting any ground clearing. The areas to be cleared during the widening of the proposed access route and the reshaping of the waste disposal pit are not pristine and are already heavily disturbed, and comprise very little flora and fauna. Hence, operators will not need to be accompanied by SHE officers. To ensure that such operators stay within the relevant servitudes pegs will be set out prior to commencement of any earthworks.
- **Impact on groundwater aquifers & surface water** – The previous assessment sets out that daily visual monitoring by site manager as well as weekly spot checks by the environmental manager be carried out to check for any oil spillages that may have or are likely to enter groundwater and surface water bodies. The are no identifiable open water bodies in the vicinity of the 2 sites concerned. However, it is acknowledged that there may be localized aquifers and that process water may become contaminated with oils, resin and/ or grease as it is used and circulated throughout the production plan. Considering this, it is recommended that monthly sampling and quality testing of process water be conducted by the SHE officer to probe for possible water contamination by hydrocarbons.

- **Dust generation** – in regards to this, the previous assessment recommended the use of wet processing; use of PPE; setting speed limits to around 30 km/hr on all access roads; and possible sprinkling water over dusty areas (e.g. block offloading bays, product loading abys, access roads) where water is available for dust suppression purposes. As part of ongoing and proposed new activities the proposed speed limits, use of wet processes in the cutting & polishing plants, and effective usage of PPE will remain unchanged. Due to water scarcity however no water spraying over loading bays or access routes will be practiced at the existing nor the new operations. Instead it is recommended that crushed marble/ granite aggregates be placed over such areas to suppress dust generation.

- **Job Creation** – The previous assessment recommended that locals must be preferred and must be availed opportunities to develop adequate technical skills in the dimension stone production value chain by working as understudies to skilled and experienced personnel. This practice shall continue.

- **Potential upsurge in HIV/ AIDS infections** – The previous assessment recommended that the project proponent offers adequate awareness raising in regard to this issue. It is recommended that this practice continues in addition to providing contraceptives to their employees.

- **Solid waste (wires, drill bits, human waste)** – The previous assessment had recommended that all solid waste be disposed off at the Karibib Town Council's waste

dump site. The previous assessment did not make mention of how natural stone waste such marble/ granite dust and stone breakoffs should be managed. To a large extent only domestic and office waste is currently being disposed off at the municipal waste dump site. Other solid waste such as scrap metals, used containers & drums are disposed through off-take contractors. The marble/ granite stone breakoffs are currently bagged into 1-ton bags and are subsequently sold to overseas off-takers for reuse in producing artificial natural stone slabs, table tops and tiles. The main changes arising from the proposed activities is the stand-alone management of the non-toxic marble/ granite dust and some stone breakoffs, for which it is proposed that they be disposed off at a designated abandoned borrow pit to simultaneously solve the issue of excess dust generation in town, and also protect the public from drowning incidences arising from the open pit which floods during the rainy seasons. It is further recommended that some stone breakoffs must be crushed to aggregates and used as surface wearing course on all access roads to help suppress dust generation.

- **Land and soil disturbance** – The previous assessment recommended that topsoil stripped from any areas should be stockpiled and conserved for later use in rehabilitation works. At the stone processing facility this practice was likely implemented but due to space constraints for the marble/ granite dust such soil is likely to have been mixed with the dust (possibly also aggravated by wind blowing). At the abandoned borrow pit no evidence of topsoil stockpiles was observed but for areas that will be extended during the reshaping exercise such soils will be stockpiled and conserved. Similarly, any topsoil stripped along the proposed waste haulage route during the widening exercise will be stockpiled and conserved for later usage in rehabilitation works.

6. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental effect arising from the proposed amendment(s):

The various additional measures proposed for the proposed amendments are well articulated in the Environmental Overview Report, and only the key ones are briefly highlighted below:

- **Construction of a sloping concrete lined pad at the stone processing site will facilitate fast drainage and maximize water recovery from wet sludge.**
- **Trucking of marble/ granite dust in a slightly wet state to the proposed dust disposal pit will eliminate risk of marble dust generation during this transportation process**
- **The proposed off-site disposal and storage of marble/ granite dust will eliminate the issue of excess dust in town**
- **The controlled access to and reclamation of the abandoned borrow pit with non-toxic marble/ granite dust will de-risk the public from drowning in the pit during the rainy seasons**
- **Fencing and controlled access to the abandoned pit area will eliminate the issue of illegal waste dumping**
- **Joint management of the proposed marble/ granite dust disposal pit with the Town Council officials will equip the Town Council with the necessary skills on how best to manage natural stone waste. This will be beneficial for managing the upcoming municipal waste landfill**

PART D DECLARATION BY APPLICANT

I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental clearance certificate may be suspended, amended or cancelled if any information given above is false, misleading, wrong or incomplete.

pp	**L. Liebenberg**	**Representative: Project Proponent**
Signature of Applicant	Full name in Block Letters	Position
Marmorwerke Karibib (Pty) Ltd	**19 January 2022**	
On behalf of	Date	

OMAVI
+264 81 478 6303
info@omavi.com.na
Geotechnical & Geo-Environmental Consultants | Reg. No. cc/2018/ 08788

Date: 10 February 2022

Mr. Timoteus Mufeti

The Environmental Commissioner

Ministry of Environment, Forestry and Tourism

Windhoek, Namibia

Dear Sir,

RE: TRANSFER OF ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) FROM BEST CHEER INVESTMENTS NAMIBIA (PTY) LTD TO MARMORWERKE KARIBIB (PTY) LTD

We, hereby would like to inform your esteemed office that the previous ECC for this operation was registered under the name Best Cheer Investments Namibia (Pty) Ltd, which is only a sister company of Marmorwerke Karibb (Pty) Ltd. Marmorwerke Karibb (Pty) Ltd is now fully in charge of the stone processing plant and the associated proposed abandoned borrow pit which is to be reclaimed and rehabilitated by backfilling with marble/ granite dust.

With the above in mind, please register the new (upon renewal) under the company name, Marmorwerke Karibb (Pty) Ltd.

Thank you

Faithfully & Respectfully Yours,

E. Kanime

Appointed Environmental Management Specialist

OMAVI GEOTECHNICAL AND GEO-ENVIRONMENTAL CONSULTANTS cc
No. 22, Robin Road, Whk, Namibia
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Geotechnical & Geo-Environmental Consultants | Reg. No. cc/2018/ 08788

24 January 2022

Mr. Timoteus Mufeti,

Environmental Commissioner

Ministry of Environment, Forestry and Tourism

Namibia

E: Timoteus.Mufeti@meft.gov.na

Dear Mr. Mufeti,

RE: APPLICATION FOR RENEWAL AND TRANSFER OF ENVIRONMENTAL CLEARANCE CERTITICATE

This letter is intended to explain the scope of proposed activities to be covered under the Environmental Clearance Certificate (ECC) renewal for the continuation of dimension stone processing activities at the Marmorwerke Karibib facility. The letter further serves to notify your esteemed office that the new ECC to be issued upon renewal must be **transferred from the current holder, Best Cheer Investments Namibia (Pty) Ltd**, to **Marmorwerke Karibib (Pty) Ltd**.

The proposed activities to be covered under the renewed ECC shall include:

- The full operation of the Marmorwerke Karibib stone processing facility, including associated block and final product distribution as well as maintenance activities
- Widening of the haulage access gravel road connecting the stone processing facility to an abandoned borrow pit which shall be reclaimed by backfilling with natural soils, marble/ granite dust, and marble/ granite stone offcuts
- Reshaping of the abandoned borrow pit
- Fencing of the abandoned borrow pit
- Controlled backfilling of the abandoned borrow using alternating layers of natural soils, marble/ granite dust, and marble/ granite stone offcuts

In line with the facts presented above, we have attached to this letter both the ECC renewal application and the ECC ownership transfer application.

Should you have any questions, please do not hesitate to contact the undersigned. Thank you in advance

Yours Faithfully,

OMAVI Geotechnical & Geo-environmental Consultants cc

E. Kanime

BACKGROUND INFORMATION DOCUMENT (BID)

RENEWAL of Environmental Clearance Certificate for the Continued Operation of the Existing Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands, Karibib Constituency, Erongo Region, Namibia

Proponent: Marmorwerke Karibib (Pty) Ltd
P.O Box 4676
Walvis Bay

Prepared by: Omavi Geotechnical & Geo-Environmental Consultants
(*Environmental Assessment Practitioner*)
enviro@omavi.com.na
+264 81 478 6303

Date: January 2022

1 INTRODUCTION

1.1 Aim of this document

The purpose of this document is to:

- Briefly introduce the proposed project, related activities the process to be followed in evaluating the current conditions of the receiving environment, and the drafting of the Environmental Management and Rehabilitation Plan (EMRP) for the existing Dimension Stone Processing Facility in Karibib and the proposed marble/ granite dust disposal borrow pit to potential interested and affected parties (I&APs);
- Provide guidance on how I&APs can become and remain involved in the environmental overview process and the drafting of the Environmental Management and Rehabilitation Plan by contributing suggestions, and raising concerns plus issues relating to the current and proposed operational activities;
- Invite the relevant competent authorities and interested members of the public to register as I&APs and be added to the project's stakeholder database so that they can stay informed and be involved in contributing constructive suggestions, issues, and concerns pertaining to the renewal of the Environmental Clearance Certificate; and
- To afford all I&APs with an opportunity to comment or provide inputs and concerns on the proposed project activities, considering a diverse array of aspects such as biophysical, socio-economic, water resources, visual, heritage/ archaeological and geological factors.

All comments, inputs and suggestions from I&APs to be received will be incorporated into a single Environmental Overview and Environmental Management + Rehabilitation Plan (EMRP) report which will ultimately be submitted to the relevant Competent Authorities, namely: the Department of Environmental and Forestry Affairs (DEFA) in the Ministry of Environment, Forestry and Tourism and the Karibib Town Council.

1.2 About the Proponent

Marmorwerke Karibib (Pty) Ltd is a Namibian registered company based in the town of Karibib and operates the second largest dimension stone processing factory in Namibia. It is by far the second largest employer in Karibib, in terms of the number of people employed.

1.3 About the Environmental Assessment Practitioner

OMAVI Geotechnical & Geo-environmental Consultants is a specialist environmental management consulting entity, registered under the Namibian constitution's Company Act. OMAVI has considerable experience in:

- biophysical and socio-economic impact assessments,
- best practice environmental assessment and management reporting,
- Waste Management Planning,
- the drafting of project-specific Environmental Management and Rehabilitation Plans (EMRPs),

- stakeholder engagement and participation coordination, and
- the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) process including the sourcing of competent specialists.

OMAVI has been active in the above fields for over 3 years, and in so doing has made a positive contribution towards the achievement of environmental management and sustainable development objectives in Namibia.

1.4 Project Background and Locality

OMAVI Geotechnical & Geo-environmental Consultants were appointed by Marmorwerke Karibib (herein referred to as "the Proponent") to undertake an Environmental Overview and amend the site-specific Environmental Management and Rehabilitation Plan (EMRP) for the existing and operational Dimension Stone Processing Factory in Karibib. The Environmental Management and Rehabilitation Plan (EMRP) report will in turn support the **application for the renewal** of the Environmental Clearance Certificate (ECC). One of the main amendments to be made to the EMRP is the disposal of the marble/ granite dust/ slightly moist sludge at an existing abandoned borrow pit located on the northern periphery of the town. It is envisioned that the disposal of marble/ granite dust/ slightly moist sludge at this existing abandoned borrow pit will serve to reclaim and rehabilitate the pit, which is regarded a drowning hazard for children from the Karibib low-income location, while also resolving the issue of excess dust generation within the town caused by the current practice of storing marble/ granite dust on the Marmorwerke Factory's site. The current ECC expires on the 26th of April 2022.

The renewal of the ECC with ensure that the operation of the existing factory continues to comply with the Environmental Management Act, 2007, and the 2012 Environmental Impact Assessment (EIA) regulations, while ensuring responsible as well as sustainable beneficiation and development of the natural stone industry in Namibia.

The Marmorwerke Karibib stone processing factory is located within the town of Karibib on the western boundary of the town and along the B2 national highway enroute the town of Usakos and Walvis Bay. The abandoned borrow pit, which is to be reclaimed with marble/ granite dust/ slightly moist sludge, is located about 1.5 km to the north of the town's CBD, along an existing gravel road leading to the town's oxidation ponds and the Karibib Military base. Therefore the project area lies in the Karibib Constituency, Erongo Region, Namibia with the following approximate centre point coordinates:

- 21.939613° S / 15.845977° E (for the Natural Stone Processing Factory)
- 21.924983° S/ 15.851111° E (for the abandoned borrow pit)

The factory and borrow pit sites measure approximately 10 Ha and 1.5 Ha, respectively. A locality map of the sites is provided in Figure 1 below.

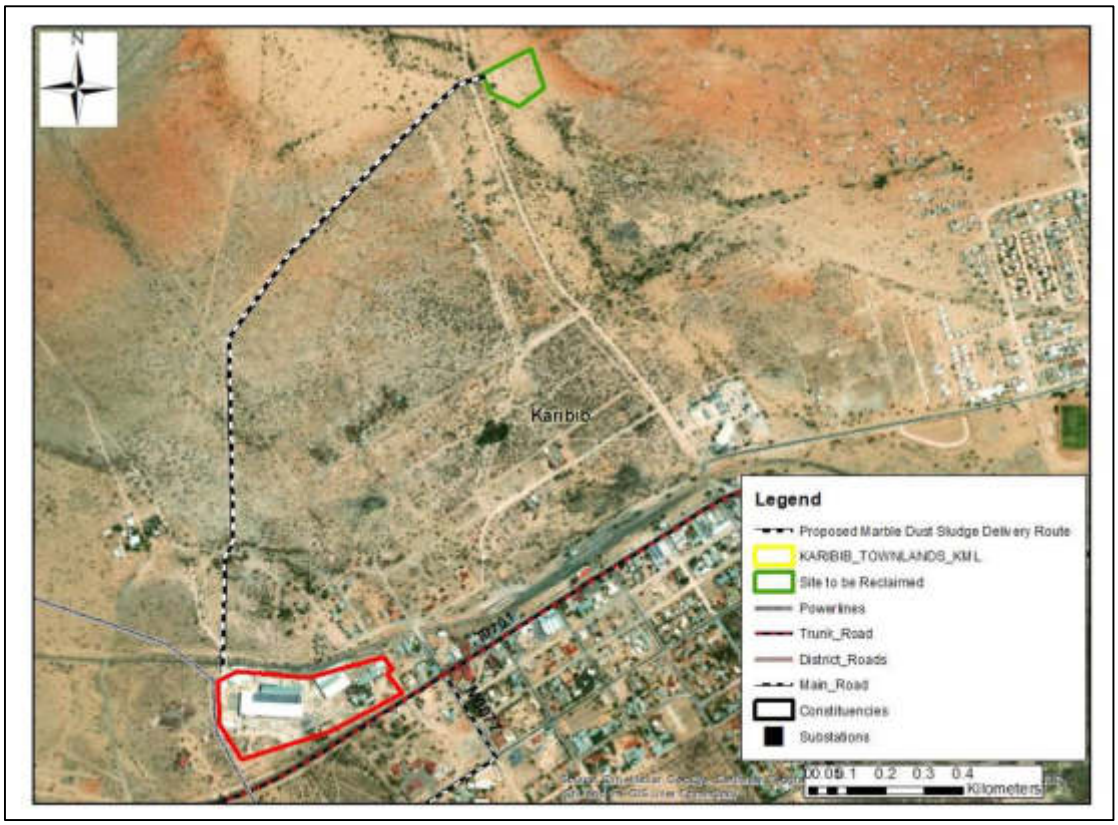


Figure 1: Close up locality map of the project sites.

1.5 Why is the Environmental Scoping Assessment (ESA) required?

In terms of the Environmental Management Act (EMA), 2007 and the Environmental Impact Assessment Regulations of 2012, the activities concerned in this project involve the continued operation of a marble and granite dimension stone processing plant, and the reshaping and subsequent disposal of solid waste into an abandoned borrow pit; which are classified as listed activities that may not be carried out without a valid Environmental Clearance Certificate (ECC) issued by the Environmental Commissioner.

In order to support the **application for the renewal** of the ECC, an Environmental Overview and Environmental Management + Rehabilitation Plan (EMRP) report must be submitted to the Department of Environmental and Forestry Affairs (DEFA) for scrutinization. This would in turn enable the DEFA to make an informed and knowledge-based decision on the renewal of the current ECC.

2 PROJECT DESCRIPTION

Between 2017 and 2018 the Marmorwerke Karibib (Pty) Ltd entity was created to revamp, modernise and revive the then Karibib Stone Marble Works on Erf no. 222 and Erf no. 588 in Karibib. This process entailed the expansion of existing infrastructure at the time as well as the installation of modern and high production capacity cutting and polishing equipment. The general stone beneficiation process flow plus all other

aspects of the factory's operation, including the handling of marble/ granite dust, basically remained the same. For this reason, there is a legacy issue stemming from the previous ownership.

Blocks of marble and granite are brought to the Karibib Stone Processing Factory from various quarries in the vicinity of Karibib, and are subsequently cut and polished to produce a variety of natural stone products such as wall cladding slabs, table tops, tiles and marble/ granite chips. These final products are primarily sold to oversees markets but are also available to local consumers.

The processes of cutting and polishing the natural stone blocks to produce the above-mentioned products generate substantial quantities of natural stone waste in the form of marble/ granite dust or sludge. This is typically in addition to other forms of waste such as scrap metals, used oils, used wood, and domestic solid waste.

As part of Marmorwerke Karibib's strategy to continuously improve its operations and align to industry best practice, from an environmental standpoint, marble and granite dust and/ or sludge generated from the factory will no longer be disposed and stored at the factory's premises. A designated abandoned borrow pit has been identified, located on the northern periphery of the town, and will be reshaped and fenced off to pave way for the disposal and storage of such solid waste. The abandoned borrow pit was previously used as a borrow source for natural construction material, but was never reclaimed nor rehabilitated after the decline in construction activities within the town. The construction and operation of the access route connecting the factory site to the abandoned borrow pit as well as the reshaping plus formalised and controlled reclamation of the borrow pit using alternating layers of natural sand and marble/ granite dust or sludge are the main amendments to the current operation, and will therefore be given great consideration during the Environmental Overview and Environmental Management + Rehabilitation Planning (EMRP) process.

2.1 Project justification

The proposed project is substantiated on the following merits:

- The project will ensure sustained operation of the Karibib Stone Processing facility, which is a significant contributor to local employment, skills transfer, and provision of procurement opportunities in the form of mechanical services, transportation of blocks and finished products, cleaning services, and construction contracts.
- The Karibib Stone Processing facility is currently the second largest stone processing facility in the country, and therefore contributes immensely to local beneficiation of natural stone which in turn has the benefit of putting Namibia on the global map as a key player in the dimension stone industry.
- Socio-economic benefits in the form of local employment to the youth, social corporate responsibility to the Karibib Town Council, and continued growth and formalisation of the local dimension stone industry.

3 PROPOSED PROJECT FLOW PROCESS

As part of the environmental overview assessment process, significant impacts from the proposed activities shall be identified and systematically assessed. Subsequently, various pragmatic impact mitigation, enhancement and management measures will be formulated to help reduce, manage and/ or prevent possible adverse consequences while enhancing positive ones. The flow chart shown in Figure 2 below will be followed in completing the environmental overview, and drafting a site specific environmental management and rehabilitation plan.

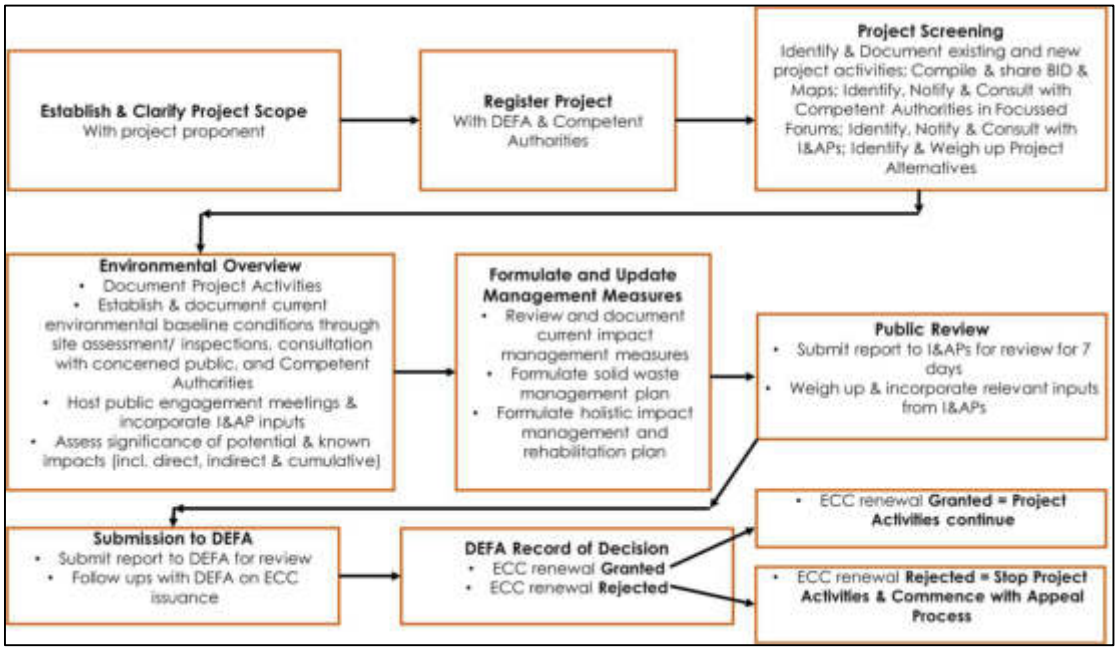


Figure 2: EIA Process.

3.1 The Proposed Public Participation Process and Way Forward

Public consultation is an essential part of any environmental overview and impact management/ rehabilitation planning process, and is fully endorsed under Sections 21 to 24 of the 2012 EIA Regulations. The process provides interested and affected parties (I&APs) with an opportunity to learn about the proposed activity and be afforded a fair chance to continuously participate and raise any issues, concerns and suggestions they may have regarding the project concerned. The feedback received from I&APs who are identified and registered for this project will form part of the environmental overview and impact management/ rehabilitation plan report.

In order to alert the general public about this project, the following mechanisms have been or shall be implemented:

- A centralised project initiation and notification email will be send out to identified I&APs. The email encompasses the BID and project locality maps
- Advertisements in three local newspapers, namely: The Republikein, The Namibian Sun and The Allgemeine Zeitung
- Placement of site notices at the following publicly accessible places:
    - Erongo Regional Headquarters

- Karibib Town Council Offices
- Karibib Constituency Office (in Karibib)
- Notice board by the Karibib OK Supermarket
- Entrance to the Marmorwerke Factory and
- Fence adjacent to the abandoned borrow pit site

I&APs are encouraged to submit their comments and concerns in writing during the period of the environmental overview and impact management/ rehabilitation planning process comments' period. For these comments to be considered, they must reach Omavi Geotechnical & Geo-environmental Consultants, in writing, before close of business on the 12th **February 2022** - **Please use the contact details at the end of this document for such communication.**

A public consultation/ engagement meeting is scheduled to take place as per the details below:

- **Date:** 29 January 2022
- **Starting Time:** 09h00
- **Venue:** To Be Confirmed with registered I&Aps

All those who register as I&APs for this project will be notified when the environmental overview and impact management/ rehabilitation plan report is completed and will receive the draft report for their review and comments for a period of 7 days.

Should you require more information about the proposed project activities, or wish to contribute any comments, suggestions or concerns, please send them in writing to the following details:

Mobile.: +264 81 478 6303 (*For record keeping purposes, comments should be submitted via SMS or WhatsApp for I&APs without email addresses*)

Email: enviro@omavi.com.na

APPENDIX C – CONSENT LETTERS/ DOCUMENTATION FROM RELEVANT AUTHORITY

KARIBIB TOWN COUNCIL

Office of the Chief Executive Officer

Tel: +264 (0)64 550016 | 19 Kalk Street | P.o. Box 19
Fax: +264(0)64 550032 | www.karibibtown.org | Karibib, Namibia

Enquiries: Office of the CEO
Email: goreseb@karibibtown.org
Email: pa2ceo@karibibtown.org

14th December 2021

Mamorwerke Karibib (PTY) LTD.
P.O. Box 4676
Walvis Bay
Namibia
Tel: +264 64 281250

CONSENT LETTER FOR TEMPORARY DISPOSAL OF MARBLE /GRANITE SLUDGE DUST

Karibib Town Council hereby grants permission to Mamorwerke Karibib (PTY) Ltd. for the temporary disposal of marble/granite sludge dust at open pit Karibib Town Land as per the attached locality map.

However, this provision of the consent letter is subject to:

1. An Environmental Clearance Certificate being issued for the site by the Enviromental Commissioner before disposing of the dust;
2. That the allocated site be temporary fenced off by Mamorwerke Karibib (PTY) Ltd. to avoid illegal dumping whilst the EIA is in the process and danger hazards must be clearly displayed on the site;
3. That Mamorwerke Karibib (PTY) Ltd. to work closely with our Environmental Health department when conducting the rehabilitation works;
4. The site will be used strictly for rehabilitation and no other activity should be performed or undertaken without Council approval.

I trust you find this in order.

Your truly,

Karibib Town Council PO Box 19, Karibib
2021 -12- 14
Tel: 064 - 550016 Fax: 064 - 550032
Office of the Chief Executive Officer

P.P
Lesley Grand Goreseb (Mr.)
CHIEF EXECUTIVE OFFICER

All official correspondences must be addressed to the Chief Executive Officer

KARIBIB TOWN COUNCIL

Office of the Chief Executive Officer

Tel: +264 (0)64 550016
Fax: +264(0)64 550032

19 Kalk Street
www.karibibtown.org

P.O. Box 19
Karibib, Namibia

Enquiries: Office of the CEO
Email: goreseb@karibibtown.org/pa2ceo@karibibtown.org

17th February 2022

Marmorwerke Karibib (PTY) Ltd
P.O. Box 4676
Walvis Bay
Namibia
Tel: +264 64 281250

RE: REQUEST TO TEMPORARY FENCE OFF THE BORROW PIT

The above-mentioned letter dated 12 December 2021 bears reference.

The Karibib Town Council hereby requests that your company (Mamorwerke Karibib (PTY) Ltd) temporary fence off the borrow pit and to install the danger hazards signage as a matter of urgency, while the Environmental Clearance Certificate is being processed.

Karibib has received heavy rainfall in the last two weeks. The borrow pit has filled with water, and children from the community, particularly from the Harambee location, are swimming in it.

Last year, a fatal incident occurred in the same location when a child drowned. In this regard, we sincerely request your institution to construct a fence around the borrow pit for the safety of the community.

We look forward to your usual support and co-operation.

Yours Truly,

Karibib Town Council
PO Box 19, Karibib
Tel: 064 - 550032
Fax: 064 - 550032
Office of the Chief Executive Officer

P.P 2022 -02- 17

Lesley Grand Goreseb (Mr.)
CHIEF EXECUTIVE OFFICER

All official correspondences must be addressed to the Chief Executive Officer

APPENDIX D – TECHNICAL MEMORANDUM & FACTUAL LABORATORY TEST DATA FOR MARBLE & GRANITE DUST/ SLUDGE

OMAVI
+264 81 478 6303
info@omavi.com.na
Geotechnical & Geo-Environmental Consultants | Reg. No. cc/2018/ 08788

MEMORANDUM

PREPARED FOR:	**PREPARED BY:**
Marmorwerke Karibib (Pty) Ltd & Karibib Town Council	OMAVI Geotechnical & Geo-Environmental Consultants
Attention: L. Liebenberg & L. Goreseb	**In copy:** S. Ilovu, E. Tjombumbi, C. Namene, S. Au-khaob
Date: 27 October 2021	File Reference No. *MAR-KR/2021/A*

RE: GEOTECHNICAL AND GEOCHEMICAL CHARCATERIZATION OF MARBLE DUST AND PROCESS WATER FROM THE MARMORWERKE KARIBIB STONE PROCESSING FACTORY IN KARIBIB, ERONGO REGION

INTRODUCTION

As part of ongoing efforts by Marmorwerke Karibib (Pty) Ltd to find a solution for the short-term disposal of dry to slightly moist marble sludge and/ or dust generated from its Karibib stone processing factory, four (4) samples of marble dust/ sludge and two (2) samples of process water were collected from the site, and were ultimately subjected to geotechnical as well as geochemical testing. The samples were primarily collected from the water recovery dams on site with one of the samples (KR_SL_2) collected from the dry stack outside the main process plant. **Appendix A** shows the locality of the samples collected, while laboratory test certificates for the analytical test work completed are provided in **Appendix B**. Geotechnical testing of the marble sludge/ dust was conducted at Omamanya Laboratory Services while geochemical testing of both process water and sludge/ dust was carried out by Analytical Laboratory Services.

This memorandum summarizes the results and interpretation of the test work, and further provides implications for possible short-term disposal and land reclamation of the existing borrow pits located to the immediate north of Karibib by using slightly moist to dry marble sludge/ dust and small stone off cuts generated from the Marmorwerke Karibib stone processing factory. The results also have implications for the planning, design and construction of the proposed formal Karibib Town waste dump or landfill, which is envisioned to be the more long-term solid waste disposal solution.

TESTWORK OBJECTIVES, METHODS AND INTERPRETATION PRINCIPLES

Objectives

In order to evaluate the pollution potential of the marble sludge/dust and process water, these materials were assessed with respect to the following environmental aspects:

- Potential to generate dust,
- Net acid generating potential
- Likelihood of enhancing metal enrichment and
- Water quality of the process water and the likely impact of such water on the environment

Test Methods Used and Interpretation principles

The test methods applied in this assessment are widely used and accepted methodologies for the geotechnical and geochemical characterization of mine waste.

Table 1. Parameter tested, testing intent and method/ guidelines

Parameter	Intent of test	Test Method(s) & Interpretation Guidelines	Reference No.
Foundation Indicators (Particle Size Distribution, Atterberg Limits) of marble sludge/ dust	- To determine particle size distribution of the fine-grained marble sludge/ dust, approximate shear strength and drainage properties, and the potential for expansion or shrinkage. Collectively, these tests help to classify the type of soil, and predict its behavior with respect to engineering properties such as bearing capacity & susceptibility to excessive settlement when loaded, drainage, and ease/ difficulty of being blown by wind and generate excessive dust.	ASTM D2487-06	1 & 2
Potential for Acid Formation (PAF) in the marble sludge/ dust	- The PAF was assessed by determining the pH of paste solutions and the Net Acid Generation (NAG). The NAG directly measures the samples ability to produce acid through	Static NAG – which involves the addition of hydrogen peroxide to the sample and allowing these to react overnight before heating for 3hrs; followed by titration to pH 7.0 to determine the acidity produced	3, 4, 5,6 & 7

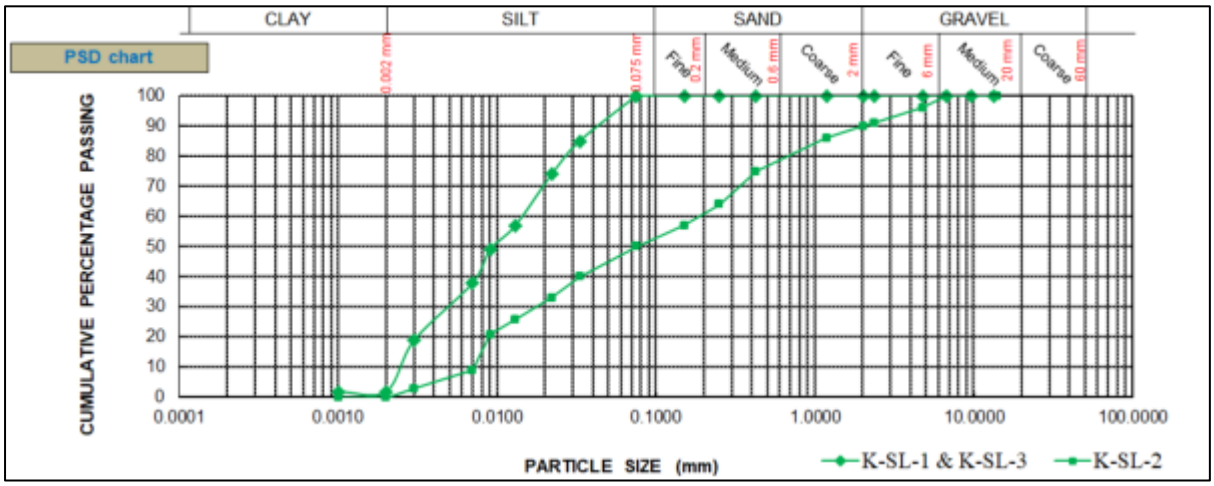
	sulfide oxidation	by the oxidation reactions. Static pH of sample paste – a paste of each sample was subjected to pH testing after 10 minutes and after 24 hours to determine the inherent pH of each sample	
Multi-element analysis (ppm of Cr, Cd, Pb, Co, Ni, Cu, Zn, Mn) of marble sludge/ dust	- The GAI was used to evaluate potential enrichment of the sludge/ dust in major elements - The results of the multi-element analysis have also been compared to a set of soil quality screening guidelines for assessing risk to human health, ecological aspects and risk of soil contamination.	- Multi-element analysis of the tailings solids was conducted to assess element enrichments within the sample. Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) data was used to calculate the geochemical abundance index (GAI) which indicates potential enrichment of the sludge/ dust in major elements relative to crustal abundance	8, 9 & 10
Process water quality (standard physical water quality properties, macro inorganic chemical properties & micro inorganic chemical properties)	- Standard quality testing was conducted on process water which may be expected in the moist sludge during disposal to help evaluate possible risk of surface & groundwater contamination.	- Parameters covered under the Namibia effluent disposal guidelines were assessed	11 & 12

PSD – Particle Size Distribution; NAG – Net Acid Generation; PAF – Potential for Acid Formation, GAI – Geochemical Abundance Index

GEOTECHNICAL CHARACTERIZATION

Foundation indicators, namely; particle size distribution (PSD), Atterberg Limits and water content, were determined based on two (2) samples (KR_SL_2 and a 50%/50% mixture of KR_SL_1 & KR_SL_2). The latter samples were blended to get a more representative indication of the material mixture as the sludge/ dust to be recovered from the different water recovery dams will be co-disposed at the proposed site. The purpose of these geotechnical tests was to determine the fines content (i.e., percentage by weight of clay and silt sized particles) in the sludge/ dust which provides a direct means of evaluating risk of dust generation, risk of reduced quality of founding conditions and reduced drainage capacity at the proposed disposal site. The Atterberg limits provide a means of assessing the plasticity of the sludge/ dust, which could have implications on the ultimate quality of founding ground at the proposed disposal site for future land uses.

The PSD plot and plasticity chart based on Atterberg limit results are shown in Figure 1 and suggest that this material has a very high fines content (>60) and primarily classifies as a low plasticity silt according to the Unified Soil Classification System (USCS). Silt soil comprises very fine solid particles which are easily mobilized into the air by wind, and therefore, such soils are highly susceptible to dust generation. From a structural foundation design and construction standpoint, which may be of relevance to future land uses, the low plasticity silty sludge/ dust will likely result in reduced bearing capacity of the subgrade at the proposed disposal site should there be plans for future structural development over the area. Given its fine-grained and low plasticity nature, this material could be considered as a possible option for a basal foundation liner at the envisioned Karibib landfill site even though this is subject to further characterization testing.



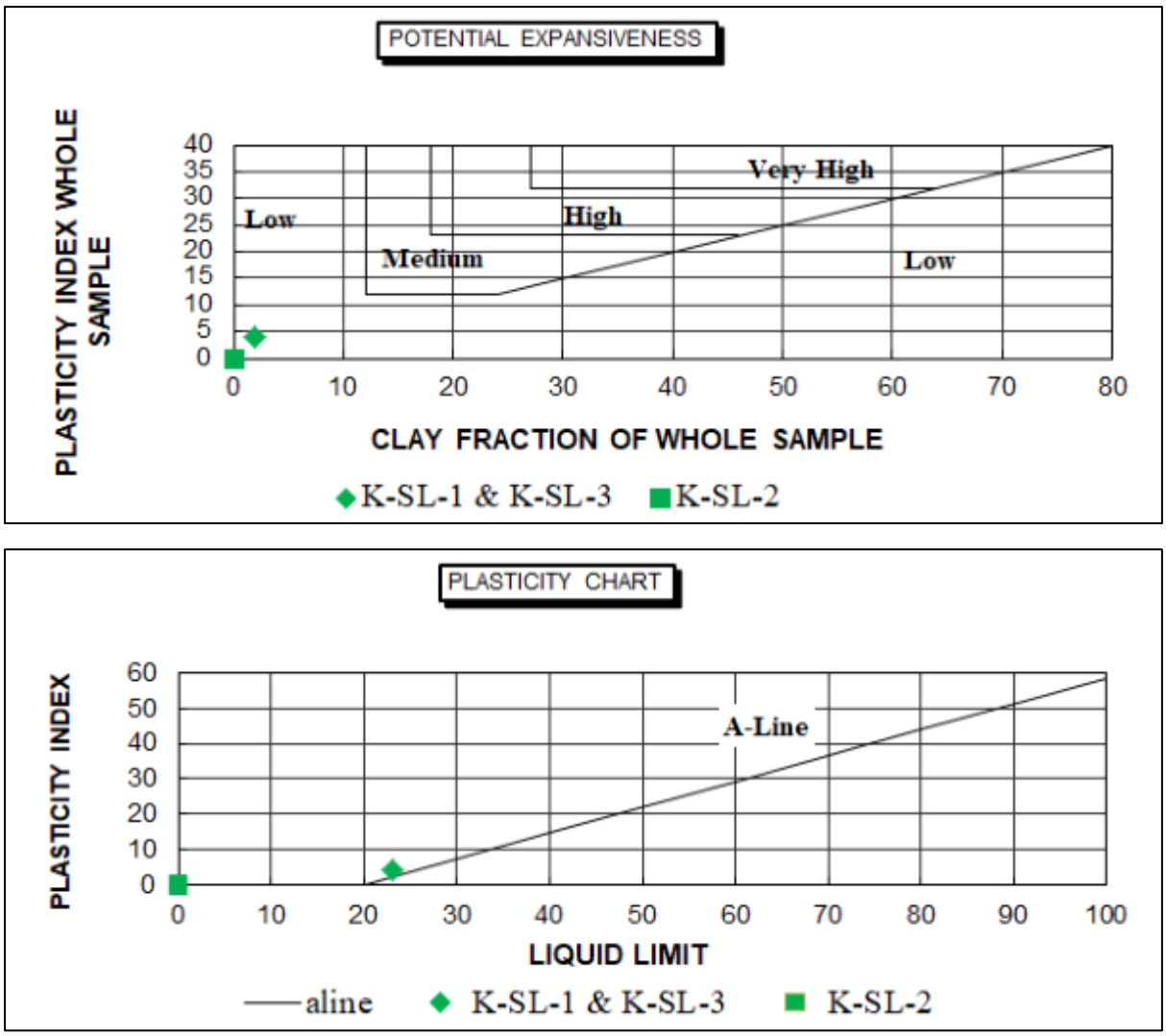


Figure 1. Particle size distribution, potential expansiveness and plasticity chart of Marble sludge/ dust produced at the Marmorwerke Karibib Plant

GEOCHEMICAL CHARACTERIZATION

General

The geochemical test work results are presented and discussed in the following sections. It should be noted that this assessment of geochemistry does not include assessment of residual process chemicals which may be present within the marble sludge/ dust.

Potential for Acid Generation

The potential for acid generation in the marble sludge/ dust was evaluated by subjecting all four (4) samples (KR_SL_1, 2, 3 & 4) to the net acid generation (NAG) test and also subjecting the paste of each sample to pH testing as per the recommended procedure outlined under reference 3 and 4. The NAG test aids in the interpretation of acid formation potential classifications, and also identifies whether any sulfides and neutralizing minerals contained in the samples are readily available to produce or consume acid. The paste pH provides an indication of the inherent pH of the material. The benchmark for determining the potential for acid formation is based on the Australian Government publication; Managing Acidic and

Metalliferous Drainage (reference no. 5) and is also broadly aligned with the Global Acid Rock Drainage Guidelines (reference no. 7). The benchmark values for PAG are stipulated under Table 2.

Table 2. Acid Formation Potential Classification System

Acid Formation Potential Class	NAPP (kg H_2SO_4 /t)	NAG pH
Potentially Acid Forming (PAF)	>10	<4.5
Potentially Acid Forming – Low Capacity (PAF-LC)	0 to 10	<4.5
Non Acid Forming (NAF)	Negative	≥4.5
Acid Consuming (AC)	Less than -100	≥4.5
Uncertain (UC)	Positive	≥4.5
	Negative	≥4.5

Where, Net Acid Producing Potential (NAPP) = Max. Potential Acidity (MPA) in ***kg H_2SO_4 /t*** *– Acid Neutralizing Capacity (ANC)*

Results of the NAG test are provided in Table 3 and indicate that under extreme oxidising conditions, none of the marble sludge/ dust samples produced any measurable acid, because the sulfide oxidation process was adequately buffered by carbonate dissolution. The final pH of the NAG solutions where moderately to strongly alkaline, with a pH range between 8.1 and 11.1, which is identical to the paste pH. Even though no MPA and ANC values were computed in the present assessment, it is anticipated that the Net Acid Producing Potential (NAPP) of the marble sludge/ dust will be negative because of the high Acid Neutralizing Capacity (ANC) induced by an abundance of carbonate minerals in this material. Therefore, based on the classification system presented in Table 3 the marble dust was classified to be Non Acid Forming, which is also in agreement with the NAG test results.

Table 3. Net Acid Generation test Results

PARAMETER	UNIT	KR-SL-1	KR-SL-2	KR-SL-4
Net Acid Generation (NAG)		**(measured)**	**(measured)**	**(measured)**
NAG pH		9.6	11.1	8.1
NAG	kg H_2SO_4/t	0	0	0
NAG interpretation		non-acid forming	non-acid forming	non-acid forming
pH on saturated paste after 10min & 24hrs		**(measured)**	**(measured)**	**(measured)**
pH after 10 mins		9.9	11.7	9.8
pH after 24hrs		9.2	11.6	9.6

Multi-Element Enrichment Analysis

Whole sample multi-element analysis of the sludge/ dust was conducted to identify element enrichments. The analysis results were compared to average crustal abundances (ACAs) to calculate the geochemical abundance indices (GAIs). The GAI quantifies an assay result for a particular element in terms of ACA.

The GAI is calculated from the following formula (reference no. 8):

$$GAI = Log_2 \frac{C_n}{1.5ACA}$$

Where: *Cn = measured concentration of element in sample in ppm or mg/kg*

The GAI is expressed on a scale of 0 to 6, with 0 indicating that the element concentration is less than or similar to average crustal abundance, and a GAI of 6 indicating an element concentration of more than 96 times the average crustal abundance.

The assay results for the major elements analyzed, the ACA and the GAI classifications are provided in Table 4.

Table 4. Multi-element Assay Results, ACA and GAI Classifications

PARAMETER	UNIT	KR-SL-1		KR-SL-2		KR-SL-4		Average Crustal Abandunces (ACA) (after Bowen, 1979)	LEGEND	
Multi-Element Assay Results		**(measured)**	**(GAI)**	**(measured)**	**(GAI)**	**(measured)**	**(GAI)**		**GAI**	**Degree of Enrichment**
Chromium (Cr)	mg/ kg	**0.64**	-7	**149**	0	**1**	-7	100	0-1	Not Enriched
Cadmium (Cd)	mg/ kg	**0.39**	1	**2.2**	3	**0.2**	0	0.11	2	Slightly Enriched
Lead (Pb)	mg/ kg	**1.4**	-3	**2.8**	-2	**2**	-3	14	3-4	Significantly Enriched
Cobalt (Co)	mg/ kg	**2.8**	-3	**15**	-1	**2.2**	-3	20	5-6	Highly Enriched
Nickel (Ni)	mg/ kg	**0.1**	-10	**7.4**	-4	**0.1**	-10	80		
Copper (Cu)	mg/ kg	**79**	0	**24**	-1	**46**	0	50		
Zinc (Zn)	mg/ kg	**21**	-2	**19**	-2	**15**	-2	75		
Manganese (Mn)	mg/ kg	**43**	-5	**318**	-2	**38**	-5	950		

The results of the analysis basically show that overall the marble sludge/ dust are not enriched in any of the major metals analyzed.

Preliminary Soil Quality Screening

The multi-element analysis results were also compared to guideline concentrations for soil quality based on risk to human health and ecology for preliminary assessment of possible closure requirements of the proposed disposal site, such as construction of engineered cover systems or limiting land use / access (Provided under reference no. 9 & 10). The Australian National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (reference no. 9) has been used to assess risk to human health, based on an assumed 'recreational' closure land use. This assumes that the final landform will comprise public open space such as parks and playing fields rather than developed or undeveloped public open space where the potential for exposure will be lower. These values assume that no planting of crops for human consumption will occur over the site. Reservation for future recreational public space is a favoured option for the proposed disposal site as the placement of structures with significant loads over the site in future could be detrimental due to the poor engineering characteristics of the sludge as suggested by the geotechnical test results presented earlier.

To assess ecological risk, the U.S. Environmental Protection Agency Ecological Soil Screening Levels (Eco-SSLs) (reference no. 10) have been applied. These values apply to sites where terrestrial organisms may be exposed directly or indirectly to contaminated soil.

Summarized assay results compared to the assessment criteria are presented in Table 5 to Table 7. The results of the multi-element analysis have also been compared to a set of soil quality screening guidelines which indicated that the samples meet the human health and soil contamination criteria (reference no. 9 & 11). There were two (2) samples (KR_SL_1 & KR_SL_2) with chromium and copper levels exceeding the stipulated levels for the ecological criteria by 4 and 1.5 folds, respectively.

Table 5. Assay Results and Human Health Soil Quality Screening Guidelines (National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013)

Element	Human Health-Based Investigation Max. Levels (ppm)	KR-SL-1 (ppm)	KR-SL-2 (ppm)	KR-SL-4 (ppm)
Chromium (Cr)	N/G	0.64	149	1
Cadmium (Cd)	90	0.39	2.2	0.2
Lead (Pb)	600	1.4	2.8	2
Cobalt (Co)	300	2.8	15	2.2
Nickel (Ni)	1200	0.1	7.4	0.1
Copper (Cu)	17000	79	24	46
Zinc (Zn)	30000	21	19	15
Manganese (Mn)	19000	43	318	38

Table 6. Assay Results and Ecological Soil Quality Screening Guidelines (United States Environmental Protection Agency (U.S. EPA) Ecological Soil Screening Levels)

Element	Ecological Soil Screening Max. Levels (ppm)	KR-SL-1 (ppm)	KR-SL-2 (ppm)	KR-SL-4 (ppm)
Chromium (Cr)	34	0.64	149	1
Cadmium (Cd)	0.4	0.39	2.2	0.2
Lead (Pb)	56	1.4	2.8	2
Cobalt (Co)	230	2.8	15	2.2
Nickel (Ni)	130	0.1	7.4	0.1
Copper (Cu)	49	79	24	46
Zinc (Zn)	79	21	19	15
Manganese (Mn)	4000	43	318	38

Values in red Highlight indicate where a guideline value has been exceeded.

Table 7. Assay Results and Intervention Soil Quality Screening Guidelines

Element	Soil Remediation Intervention Values (ppm)	KR-SL-1 (ppm)	KR-SL-2 (ppm)	KR-SL-4 (ppm)
Chromium (Cr)	380	0.64	149	1
Cadmium (Cd)	12	0.39	2.2	0.2
Lead (Pb)	530	1.4	2.8	2
Cobalt (Co)	240	2.8	15	2.2
Nickel (Ni)	210	0.1	7.4	0.1
Copper (Cu)	190	79	24	46
Zinc (Zn)	720	21	19	15
Manganese (Mn)	N/G	43	318	38

Process Water Quality

Water quality testing was conducted on process water samples for preliminary assessment of the water quality which may be expected in the wet sludge during operations and immediate disposal. Characterization of the process water has been conducted to assess the potential for the supernatant to cause pollution to surface water or groundwater, should the process water get into contact with these water sources. These tests differ from the multi-element tests conducted on the solids in that they only record the readily soluble elements, whereas the multi-element tests give the total element enrichment of the sludge/ dust solids.

Reference water quality guidelines have been established to assess the results of the process water testing. References guidelines for wastewater effluents are based on Namibian effluent guidelines (reference no. 12). The acid neutralizing capacity of the process water

was also analyzed by measuring the total alkalinity as $CaCO_3$.The test results and reference water quality guidelines are presented in Table 8 to Table 10.

Table 8. Process water physical properties and Namibian reference guidelines

DETERMINANTS	UNIT	Special Limits		General Limits		KR-H2O-1	KR-H2O-2
		95 percentile requirements					
PHYSICAL PARAMETERS		**Min**	**Max**	**Min**	**Max**	**(measured)**	**(measured)**
Turbidity	NTU		5		12	32	131
pH		6.5	9.5	6.5	9.5	9.1	9.3
Electrical conductivity	mS/m		75		75	129.5	165.1
Total dissolved solids	mg/litre		500		500	729	905
Total suspended solids	mg/litre		25		100	40	252
Total alkalinity as CaCO3	mg/litre			200	600	285	285
total hardness as $CaCO_3$	mg/litre			200	600	311	384

** Green highlight = results are within acceptable limits; * Red highlight = limit exceeded*

Table 9. Process water macro inorganic chemical properties and Namibian reference guidelines

DETERMINANTS	UNIT	Special Limits		General Limits		KR-H2O-1	KR-H2O-2
		95 percentile requirements					
MACRO INORGANIC CHEMICAL PARAMETERS		**Min**	**Max**	**Min**	**Max**		
Ammonia (NH_4– N)	mg/litre		1		10	0.02	0.02
Nitrate (NO_3- N)	mg/litre		15		20	0.5	0.5
Nitrite (NO_2- N)	mg/litre		2		3	0.02	0.06
chloride (Cl)	mg/litre		40		70	210	293
fluoride (F)	mg/litre		1		2	0.1	0.6
sulphate (SO^{2-}_4)	mg/litre		20		40	93	117
sodium (Na)	mg/litre		50		90	125	163
potassium (K)	mg/litre					51	65
magnesium (Mg)	mg/litre					71	90

** Green highlight = results are within acceptable limits; * Red highlight = limit exceeded*

Table 10. Process water micro inorganic chemical properties and Namibian reference guidelines

DETERMINANTS	UNIT	Special Limits		General Limits		KR-H2O-1	KR-H2O-2
		95 percentile requirements					
MICRO INORGANIC CHEMICAL PARAMETERS		**Min**	**Max**	**Min**	**Max**		
Aluminium (Al)	mg/litre		25		200	9.5	9.6
Antimony (Sb)	mg/litre		5		50	2.8	2.5
Arsenic (As)	mg/litre		50		150	11	11
Barium (Ba)	mg/litre		50		200	48	40
Boron (B)	mg/litre		500		1000	354	297
Chromium (Cr)	mg/litre		50		1000	1.3	1.3
Copper (Cu)	mg/litre		500		2000	3.8	11
Iron (Fe)	mg/litre		200		1000	0.08	0.58
Lead (Pb)	mg/litre		10		100	0.11	0.13
Manganese (Mn)	mg/litre		100		400	0.39	0.44
Mercury (Hg)	mg/litre		1		2	1.7	1.3
Nickel (Ni)	mg/litre		100		300	1.2	1
Selenium (Se)	mg/litre		10		50	0.97	0.932
Thallium (Tl)	mg/litre		5		10	0.1	0.06
Tin (Sn)	mg/litre		100		400	0.223	0.48
Titanium (Tl)	mg/litre		100		300	0.442	0.442
Zinc (Zn)	mg/litre		1		5	1.9	1.9
Uranium (U)	mg/litre		15		500	14	1.2

** Green highlight = results are within acceptable limits; * Red highlight = limit exceeded*

Based on the comparison done with Namibian effluent guidelines (reference no. 12) the following findings could be deduced:

- In terms of physical parameters the key findings are as follows:
    - Turbidity levels in the two samples (KR-H2O-1 and KR-H2O-2) analyzed exceed the upper bound threshold value. This is to be expected considering the high fines content of the sludge which tend to remain in suspension.
    - The measured pH suggests strongly alkaline conditions. This is largely attributed to the abundance of carbonate minerals in the sludge.
    - Threshold values for electrical conductivity (EC), total dissolved solids (TDS) and total suspended solids (TSS) are also exceeded. The high electrical conductivity is attributed to the high levels of sodium and chlorides in the process water while the high TSS are attributed to the high fines content and the high surface area for water-solids interaction arising from the fine-grained nature of the solids.
    - The total alkalinity and total hardness are well within the stipulated limits. Total alkalinity refers to the capability of water to neutralize acid and is essentially an expression of buffering capacity. A buffer is a solution to which an acid can be added without changing the concentration of available H+ ions and without changing the pH appreciably. Calcium carbonate ($CaCO_3$) or other compounds such as magnesium carbonate contribute carbonate ions to the

buffering system. It is perceived that the higher alkalinity level in the process water will buffer generation of acid in surface and groundwater (which may develop due to the presence of significant sulphate content), and therefore prevent pH changes that are harmful to aquatic life.

- In terms of chemical composition, the acceptable threshold values for sodium, chloride and sulphate are exceeded. High concentrations of sodium and chloride impart a salty taste to water at levels in excess of 250 mg/litre and that is usually harmful to aquatic organisms. Additionally, high concentrations of sodium and chlorides cause corrosion of metals, for instance, in reinforced concrete foundations, pipes and other buried municipal services. High sulphate content is undesired for effluent discharged in areas with potential for drinking water sources. This is largely because of the undesirable taste and odour it causes in potential surface and groundwater drinking sources. Concentration levels for all other macro inorganic components are well within the stipulated limits.
- Levels of the analyzed metallic elements in the process water are well within the recommended threshold limits

IMPLICATIONS FOR WASTE DISPOSAL

Key implications of the above results on the proposed disposal of slightly moist to dry marble sludge/ dust at the existing borrow pit can be summarized as follows:

- The sludge/ dust has a high fines content which makes it susceptible to dust generation during transportation, disposal and storage. To ensure that dust generation is minimized during transportation and disposal to the proposed site the material must be transported as a thickened cake in slightly moist form (not in wet slurry nor dry form), and the tipper truck(s) bins should be covered during transportation. To minimize and mitigate dust generation at the proposed site during storage the following practices must be implemented:
    - The sludge/ dust must be deposited in alternating layers with the natural fill from the site. Layering will ensure that layers of the sludge/ dust are covered by coarser-grained natural fill after, say every 1.5m to 2m of deposition. This will also enhance drainage of the sludge layer, thereby reducing risk of liquefaction or ground failure during progressive loading.
    - At the end of every 1.5 – 2 m lift of sludge, the sludge should be levelled and then bucket compacted with a loader or TLB or dozer. This will enhance the bearing capacity of the ground and also contribute positively towards suppression of dust as the material will not be loose and easily released into the air.
    - It is further recommended that at any given point in time an arbitrary freeboard of 1 m must be maintained between the borrow pit's crest elevation and the elevation of deposited sludge.
- The high fines content coupled with the high liquid limit values of the sludge/ dust will likely compromise the bearing capacity of the borrow pit area; thereby making the site suitable for utilization of lightly loaded structures only in the future.
- The marble sludge/ dust was found to be non-acid forming based on the NAG test results as well as an anticipated negative NAPP induced by a high acid neutralizing potential caused by the high carbonate content. It was also found that the sludge/ dust is not enriched in toxic major elements such as Cr, Cd, Pb, Co, Ni, Cu, Zn or Mn,

and concentrations of these elements are largely well within accepted limits for human health and ecological soil quality as well as soil contamination levels.

- The process water was found to meet the majority of reference guidelines, but contains elevated levels of turbidity, TDS, TSS, chlorides, sulphates and sodium in comparison to threshold levels for effluent to be released into potential drinking water sources. The implication of this is that there could be a possible increase in turbidity, suspended solids, hardness, salinity and sulphate content of any surface water in the vicinity of the site and groundwater sources underlying or located downstream of the proposed disposal site. If any water is being abstracted from any such groundwater sources, the treatment of such water prior to its use for drinking or irrigation purposes will be required and will be relatively more expensive as these parameters would need to be improved. Based on these findings the following recommendations are made with respect to disposal at the proposed site:
    - To minimize risk of possible release of process water into underground reservoirs or the nearby surface stream, slurry sludge (i.e. wet sludge) from the cutting factory must first be dried at the factory site on a sloping concrete bund to a slightly moist to dry thickened state with low moisture content prior to trucking to the disposal site. This can be achieved by converting the northern water recovery dam into a sludge dying bund from which thickened slightly moist to dried sludge can then be trucked.

Compiled by,

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ATTACHMENTS,

APPENDIX A **Map of Samples collected at the Marmorwerke Karibib Plant**

APPENDIX B **Laboratory test results from Omamanya Laboratory as well as Analytical Laboratory Services**

REFERENCES

References on <u>Geotechnical characterization</u>

1. ASTM D2487-06: Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
2. Van der Merwe, D.H. (1964) Prediction of Heave from the Plasticity Index and Percentage of Clay Fraction of Soils. Transactions of the South African Institution of Civil Engineers, 6, 103-107.

References on <u>acid generation potential</u>

3. Miller, S., Robertson A., Donohue, T. (1997). Advances in acid drainage prediction using the net acid generation test. In Proceedings of the Forth International Conference on Acid Rock Drainage (Vancouver B.C.) pp 535 - 547.

4. Stewart, W., Miller, S., Smart, R., Gerson, A., Thomas, J., Skinner, W., Levay, G. and Schumann, R. (2003). Evaluation of the Net Acid Generation (NAG) Test for Assessing the Acid Generating Capacity of Sulfide Minerals. In Proceeding of the Sixth international conference on Acid Rock Drainage (Cairns, Australia) pp 617 - 625.

5. Australian Government, Department of Industry, Tourism and Resources (February 2007). Managing Acid and Metalliferous Drainage.

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7. The International Network for Acid Prevention (INAP) (2009). Global Acid Rock Drainage Guide (GARD Guide). http://www.gardguide.com/

References on <u>metal enrichment and soil contamination potential</u>

8. Bowen, H.J.M. (1979). Environmental Chemistry of the Elements. Academic Press, New York.
9. Australian Government (2013). National Environment Protection (Assessment of Site Contamination) Amendment Measure.
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11. Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM) 2000. Circular on Target Values and Intervention Values for Soil Remediation, Reference DBO/1999226863. Soil remediation intervention values.

References on <u>water quality</u>

12. Constitution of the Republic of Namibia (2013). Section 13(76), Standards on Effluent Quality, Act No. 11 of 2013.

APPENDIX A Map of Samples collected at the Marmorwerke Karibib Plant

APPENDIX B –Laboratory Test Results

Omamanya Laboratory Services (Pty) Ltd

Geotechnical Consultants & Laboratory Services

Reg No.: 2007/0158

6 Van Der Bijl Street Windhoek Namibia | **Tel:** +264 61 245 103/6 | **Fax:** +264 61 245 101 | **E-mail:** admin@omamanya.go.na

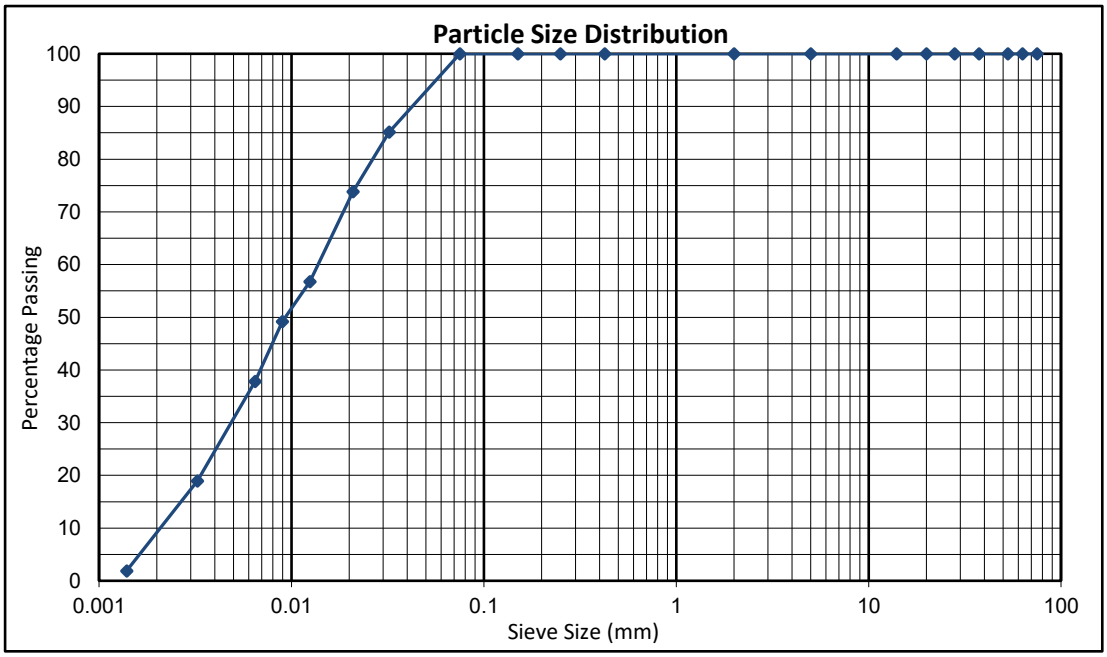
Customer:	OGGC P.O Box 2444 Oshakati Namibia	Project:	Marble Quarries Dust Characterization
		Date Received:	01-10-2021
		Date Reported:	04-10-2021
		Req. Number:	160-5775
Attention:	Joel	No. of Pages:	1/1

TEST REPORT

FOUNDATION INDICATOR - (SANS 3001 GR3) & (ASTM Method D422)

Sample Position (SV)		K-SL-1 & K-SL-3
Depth (mm):		-
Sample No.:		6396
Materials Description	Source	Insitu
	Colour	-
	Soil Type	Off-white
	Classification	Marble Sludge

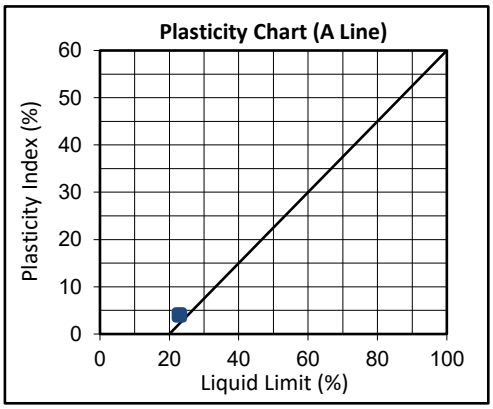
Sieve Size	% Passing
75.0	100
63.0	100
53.0	100
37.5	100
28.0	100
20.0	100
14.0	100
5	100
2	100
0.425	100
0.250	100
0.150	100
0.075	100
0.032	85
0.021	74
0.012	57
0.009	49
0.006	38
0.003	19
0.001	2

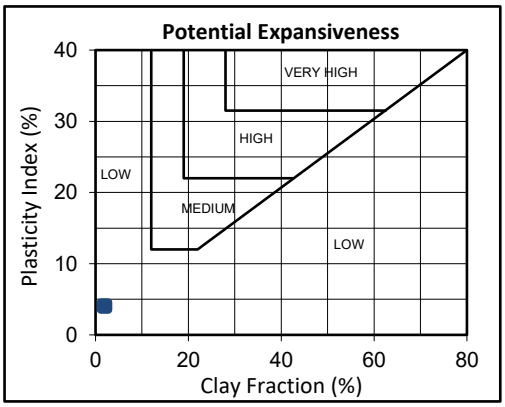


Liquid Limit (%)	23
Plasticity Index (%)	4
Linear Shrinkage (%)	2
Moisture Content (%)	21.3

% Clay	2
% Silt	98
% Sand	0
% Gravel	0

Unified Soil Classification	CL-ML
AASHTO Soil Classification	A-4





Specimens delivered to Omamanya Lab in good order.

Willem Coetzee
Laboratory Manager
For Omamanya Laboratory Services (Pty) Ltd

Omamanya Laboratory Services (Pty) Ltd

Geotechnical Consultants & Laboratory Services

Reg No.: 2007/0158

6 Van Der Bijl Street Windhoek Namibia | **Tel:** +264 61 245 103/6 | **Fax:** +264 61 245 101 | **E-mail:** admin@omamanya.go.na

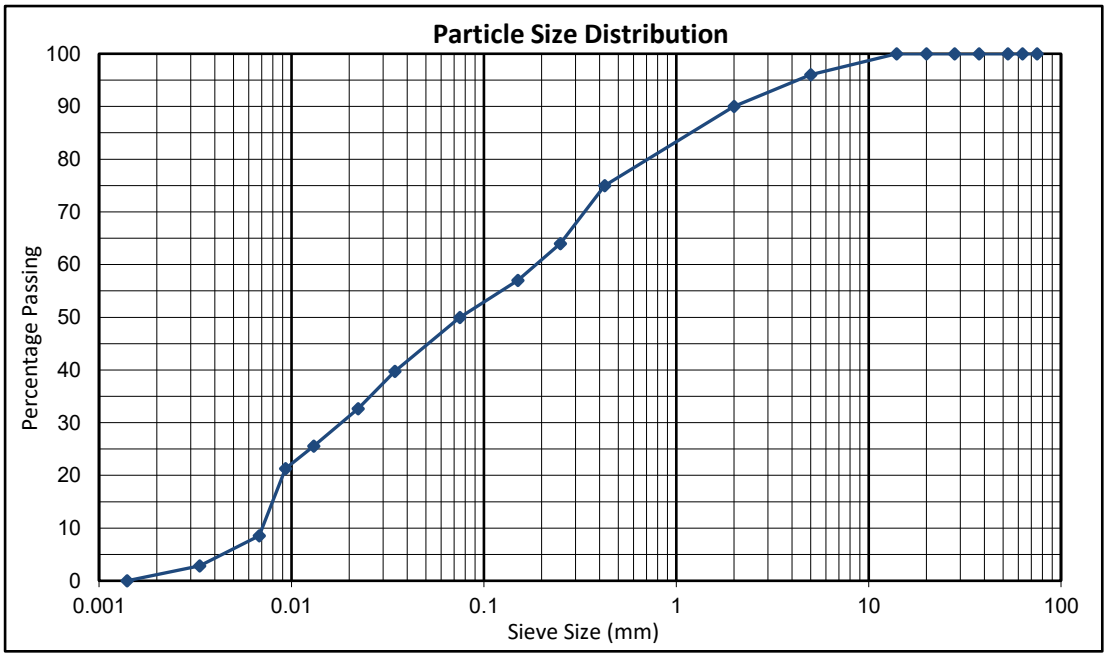
Customer:	OGGC P.O Box 2444 Oshakati Namibia	Project:	Marble Quarries Dust Characterization
		Date Received:	01-10-2021
		Date Reported:	04-10-2021
		Req. Number:	160-5775
Attention:	Joel	No. of Pages:	1/1

TEST REPORT

FOUNDATION INDICATOR - (SANS 3001 GR3) & (ASTM Method D422)

Sample Position (SV)		K-SL-2
Depth (mm):		-
Sample No.:		6397
Materials Description	Source	Insitu
	Colour	-
	Soil Type	Off-white
	Classification	Marble Sludge

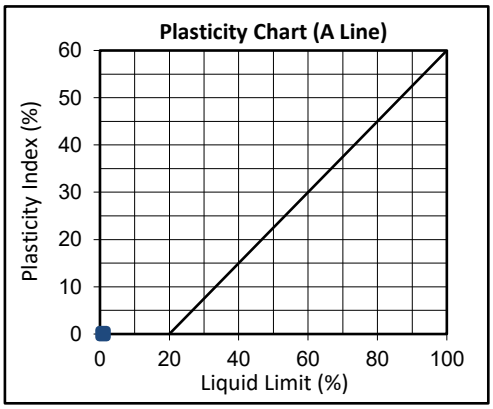
Sieve Size	% Passing
75.0	100
63.0	100
53.0	100
37.5	100
28.0	100
20.0	100
14.0	100
5	96
2	90
0.425	75
0.250	64
0.150	57
0.075	50
0.034	40
0.022	33
0.013	26
0.009	21
0.007	9
0.003	3
0.001	0

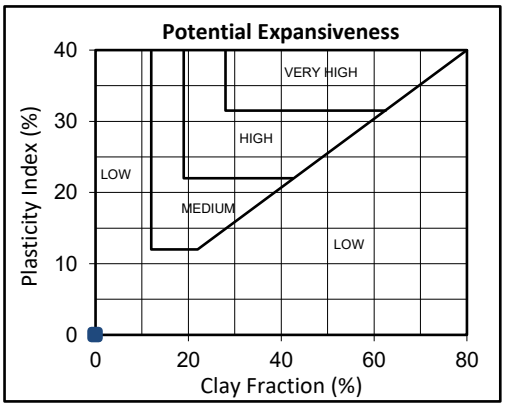


Liquid Limit (%)	SP
Plasticity Index (%)	SP
Linear Shrinkage (%)	1
Moisture Content (%)	0.2

% Clay	0
% Silt	50
% Sand	40
% Gravel	10

Unified Soil Classification	SM
AASHTO Soil Classification	A-4





Specimens delivered to Omamanya Lab in good order.

Willem Coetzee
Laboratory Manager
For Omamanya Laboratory Services (Pty) Ltd

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TEST REPORT

Client: **Omavi Geotechnical Consultants**
Address: P.O. Box 1642
Windhoek

Attn: **Etuna**
e-mail: **info@omavi.com.na**
Tel: **081-478 6303**

Date received: **28-Sep-21**
Date analysed: **4 - 10 October 2021**
Date reported: **13-Oct-21**
Client Reference: verbal
Quotation: QU-6724
Lab Reference: **I211753**
Enquiries: Ms Silke Rugheimer

Test:		NAGpH	Net acid generation (NAG)		Interpretation
Method Description:			Lapakko & Lawrence		
Unit:			kg H_2SO_4/ton	titration volume to pH 7.0, ml	
Lab No.	Sample ID				
5	**KR-SL-1**	**9.6**	**0**	**0**	**non-acid forming**
6	**KR-SL-2**	**11.1**	**0**	**0**	**non-acid forming**
7	**KR-SL-3**	**11.0**	**0**	**0**	**non-acid forming**
8	**KR-SL-4**	**8.1**	**0**	**0**	**non-acid forming**
9	**WB-SL-1**	**9.2**	**0**	**0**	**non-acid forming**
10	**WB-SL-3**	**9.3**	**0**	**0**	**non-acid forming**
11	**WB-SL-4**	**9.5**	**0**	**0**	**non-acid forming**
11R	**WB-SL-4**	10.7	0	0	

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Client Reference: verbal
Quotation: QU-6724
Lab Reference: **I211753**
Enquiries: Ms Silke Rugheimer

	Test:	pH sat. paste	pH sat. paste	EC sat. paste
	Method Description:	Sobeck et al. (1978), Page et al. (1982)		
	Unit:	after 10 min	after 24h	after 24h
Lab No.	**Sample ID**			
5	**KR-SL-1**	**9.9**	**9.2**	**68.1**
6	**KR-SL-2**	**11.7**	**11.6**	**144.4**
7	**KR-SL-3**	**10.0**	**9.4**	**118.5**
8	**KR-SL-4**	**9.8**	**9.6**	**170.8**
9	**WB-SL-1**	**10.0**	**9.4**	**59.8**
10	**WB-SL-3**	**10.0**	**9.4**	**45.6**
11	**WB-SL-4**	**9.8**	**9.2**	**121.2**

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Date received: **28-Sep-21**
Date analysed **4 - 10 October 2021**
Date completed: **13-Oct-21**
Client Reference: verbal
Quotation: QU-6724
Lab Reference: I211753
Enquiries: Ms Silke Rugheimer

	Test:	Chromium	Cadmium	Lead	Cobalt	Nickel	Copper	Zinc	Manganese
	Method Description:	Acid digestion followed by ICP-OES							
	Unit:	mg/kg Cr	mg/kg Cd	mg/kg Pb	mg/kg Co	mg/kg Ni	mg/kg Cu	mg/kg Zn	mg/kg Mn
Lab No.	**Sample ID**								
A1	**KR-SL-1**	**0.64**	**0.39**	**1.4**	**2.8**	**<0.1**	**79**	**21**	**43**
A2	**KR-SL-2**	**149**	**2.2**	**2.8**	**15**	**7.4**	**24**	**19**	**318**
A3	**KR-SL-3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
A4	**KR-SL-4**	**1.0**	**0.20**	**2.0**	**2.2**	**<0.1**	**46**	**15**	**38**
A5	**WB-SL-1**	**0.14**	**0.33**	**2.6**	**48**	**1.1**	**45**	**24**	**53**
A6	**WB-SL-3**	**2.0**	**0.25**	**3.9**	**32**	**0.2**	**56**	**31**	**47**
A7	**WB-SL-4**	**4.2**	**0.35**	**1.0**	**17**	**0.7**	**28**	**15**	**53**
A7-R	repeat	4.7	0.37	1.5	16	0.7	30	16	52

The analytical results reported here in refer to the samples on a dry basis

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Tel: 081-478 6303

Date received: 28/Sep/21
Date analysed: 1 October - 6 October 2021
Date reported: 13/Oct/21

Client Reference no.: verbal
Quotation no.: QU-6721
Lab Reference: I211753
Enquiries: Ms Manuela Mayer

Sample details	water sample
Location of sampling point	-
Description of sampling point	WB-H2O-1
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/1

				Recommended maximum limits			
				Human consumption			Livestock
Parameter	**Value**	**Units**	**Classification**	**Group A**	**Group B**	**Group C**	**watering**
p H	**8.9**		A	6-9	5.5-9.5	4-11	
Electrical Conductivity	**230**	**mS/m**	B	150	300	400	
Turbidity	**4609**	**NTU**	D	1	5	10	
Total Dissolved Solids (calc.)	**1388**	**mg/l**					6000
Total Suspended Solids	**4410**	**mg/l**					
P-Alkalinity as $CaCO_3$	**30**	**mg/l**					
Total Alkalinity as $CaCO_3$	**265**	**mg/l**					
Total Hardness as $CaCO_3$	**551**	**mg/l**	B	300	650	1300	
Ca-Hardness as $CaCO_3$	**65**	**mg/l**	A	375	500	1000	2500
Mg-Hardness as $CaCO_3$	**486**	**mg/l**	C	290	420	840	2057
Chloride as Cl^-	**403**	**mg/l**	B	250	600	1200	1500-3000
Fluoride as F^-	**0.2**	**mg/l**	A	1.5	2.0	3.0	2.0-6.0
Sulphate as SO_4^{2-}	**325**	**mg/l**	B	200	600	1200	1000
Nitrate as N	**6.2**	**mg/l**	A	10	20	40	100
Nitrite as N	**0.37**	**mg/l**					10
Ammonia nitrogen as N	**<0.02**	**mg/l**					
Sodium as Na	**255**	**mg/l**	B	100	400	800	2000
Potassium as K	**74**	**mg/l**	A	200	400	800	
Magnesium as Mg	**118**	**mg/l**	C	70	100	200	500
Calcium as Ca	**26**	**mg/l**	A	150	200	400	1000
Manganese as Mn	**0.01**	**mg/l**	A	0.05	1.0	2.0	10
Iron as Fe	**0.14**	**mg/l**	B	0.1	1.0	2.0	10
Stability pH, at 25°C	**7.7**						
Langelier Index	**1.2**	scaling		>0=scaling, <0=corrosive, 0=stable			
Ryznar Index	**6.5**	scaling		<6.5=scaling, >7,5=corrosive, ≥6.5 and ≤7.5=stable			
Corrosivity ratio	**3.4**	increasing corrosive tendency		Applies to water in the pH range 7-8 which also contains dissolved oxygen ratios <0.2 no corrosive properties ratios >0.2 increasing corrosive tendency			

Approved Technical Signatory
Ms. Manuela Mayer

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TEST REPORT

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Attn: Etuna
e-mail: info@omavi.com.na
Tel: 081-478 6303

Date received: 28/Sep/21
Date analysed: 1 October - 6 October 2021
Date reported: 13/Oct/21

Client Reference no.: verbal
Quotation no.: QU-6721
Lab Reference: I211753
Enquiries: Ms Manuela Mayer

Sample details	water sample
Location of sampling point	-
Description of sampling point	WB-H2O-1
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/1

Parameter	Dissolved Metals* Value	Units	Parameter	Dissolved Metals* Value	Units
Lithium as Li	150	µg/l	**Magnesium as Mg**	126432	µg/l
Beryllium as Be	< 0.329	µg/l	**Aluminium as Al**	12	µg/l
Boron as B	373	µg/l	**Silicon as Si**	26046	µg/l
Strontium as Sr	196	µg/l	**Phosphorous as P**	1735	µg/l
Zirconium as Zr	0.07	µg/l	**Sulphur as S**	104938	µg/l
Molybdenum as Mo	15	µg/l	**Calcium as Ca**	25520	µg/l
Cadmium as Cd	0.06	µg/l	**Titanium as Ti**	< 0.442	µg/l
Tin as Sn	0.26	µg/l	**Vanadium as V**	6.9	µg/l
Antimony as Sb	5.6	µg/l	**Chromium as Cr**	1.3	µg/l
Tellurium as Te	< 0.273	µg/l	**Manganese as Mn**	2.6	µg/l
Barium as Ba	53	µg/l	**Iron as Fe**	6.6	µg/l
Lanthanum as La	0.02	µg/l	**Cobalt as Co**	83	µg/l
Tungsten as W	194	µg/l	**Nickel as Ni**	1.5	µg/l
Iridium as Ir	< 0.012	µg/l	**Copper as Cu**	13	µg/l
Platinum as Pt	0.03	µg/l	**Zinc as Zn**	2.3	µg/l
Gold as Au	0.14	µg/l	**Potassium as K**	>	µg/l
Mercury as Hg	2.2	µg/l	**Arsenic as As**	13	µg/l
Thallium as Tl	0.37	µg/l	**Selenium as Se**	2.6	µg/l
Lead as Pb	0.39	µg/l	**Ruthenium as Ru**	< 0.031	µg/l
Bismuth as Bi	0.03	µg/l	**Rhodium as Rh**	< 0.031	µg/l
Thorium as Th	0	µg/l	**Palladium as Pd**	< 0.517	µg/l
Uranium as U	3.3	µg/l	**Silver as Ag**	< 0.1	µg/l
Sodium as Na	>	µg/l			

Remark: * = outsourced to Lab'O'Link, South Africa

<LOD
>LOD <HighStd
>HighStd <1Order
>1Order

Approved Technical Signatory
Ms. Manuela Mayer

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Unit 16, Ben Amathila Ave.

PO Box 86782, Windhoek, Namibia

Remark: Overall classification of water, considering only constituents that have been tested for: Group D, high risk water. Unsuitable for human consumption.

Interpretation based on guidelines for the evaluation of drinking water for human consumption, DWA, Namibia, April 1988 and South African Water Quality Guidelines Volume 5: Agricultural water use: Livestock watering, Second Edition, 1996

For practical reasons, the guidelines are divided into four groups.
The highest group assigned to any of the constituents determines the classification of the water as a whole.
Group A: excellent quality water
Group B: good quality water
Group C: low risk water
Group D: high risk or water unsuitable for human consumption

Ideally water should be either Group A or Group B. If water is classified as Group C, the situation is not yet critical, but attention should be given to those constituents over the Group B limit. If however, the water is classified as Group D urgent and immediate attention is required to reduce the levels of the problem constituents in the water to suitable levels.

Sample acceptance: Sample was collected in clients' own bottle.
Sample was suitable for testing

Approved Technical Signatory
Ms. Manuela Mayer

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OUR QUALITY IS IN THE DETAIL

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Assessment of water quality for human consumption

Naturally occurring chemicals that are of health significance in drinking water
Fluoride: Exposure to high levels of fluoride, which occurs naturally, can lead to mottling of teeth and, in severe cases, crippling skeletal fluorosis.
0-1.0 mg/l fluoride: no adverse health effects or tooth damage occurs

Chemicals from agricultural activities that are of health significance in drinking water
Nitrate and nitrite: In water it has been associated with methaemoglobinaemia, especially in bottle-fed infants
6-10 mg/l nitrate as N: rare instances of methhaemoglobinaemia in infants; no effects in adults. Concentrations in this range generally well tolerated.

Some of the naturally occurring chemicals which occur in drinking water at concentrations below those at which toxic effects may occur.
Chloride: high concentrations of chloride give a salty taste to water. Concentrations in excess of 250 mg/l are increasingly likely to be detected by taste.
Hardness: Depending on the interaction of other factors, such as, pH and alkalinity, water with a hardness above approximately 200 mg/l may cause scale deposition in the pipe work and tanks. On heating, hard waters form deposits of calcium carbonate scale.
pH: Optimum pH 6.5-8.
pH does not exert direct health effects, but may exert indirect health effects via metal solubility.
Sodium: The average taste threshold for sodium is about 200 mg/l.
Sulphate: It is generally considered that the taste impairment is minimal at levels below 250 mg/l.
Magnesium: The average taste threshold for magnesium is about 70 mg/l
Total dissolved solids: The palatability of water with a TDS level of less than 600 mg/l is generally considered to be good; drinking water becomes significantly and increasingly unpalatable at TDS levels greater than about 1000 mg/l.

Turbidity is a measure of the light-scattering ability of water and is indicative of the concentration of suspended matter in water.
Microorganisms are often associated with turbidity, hence low turbidity minimises the potential for transmission of infectious diseases. Turbidity also affects the aesthetic quality of water.
Turbidity in water is caused by the presence of suspended matter which usually consists of a mixture of inorganic matter, such as clay and soil particles and organic matter.
Turbidity may also be associated with the presence of inorganic ions such as manganese(II) and iron(II).
The consumption of turbid water *per se* does not have any direct health effects, but associated effects due to microbial contamination or the ingestion of substances bound to particulate matter, do.
Aesthetic effects (appearance, taste, odour) of turbidity can be mitigated or removed by decantation or by filtration (or by both), accelerated, if necessary, by previous aeration

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TEST REPORT

To: **Omavi Geotechnical Consultants**
P.O. Box 1642
Windoek

Attn: Etuna
e-mail: info@omavi.com.na
Tel: 081-478 6303

Date received: 28/Sep/21
Date analysed: 1 October - 6 October 2021
Date reported: 13/Oct/21

Client Reference no.: verbal
Quotation no.: QU-6721
Lab Reference: I211753
Enquiries: Ms Manuela Mayer

Sample details	water sample
Location of sampling point	-
Description of sampling point	WB-H2O-4
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/2

				Recommended maximum limits			
				Human consumption			Livestock
Parameter	**Value**	**Units**	**Classification**	**Group A**	**Group B**	**Group C**	**watering**
p H	**9.1**		A	6-9	5.5-9.5	4-11	
Electrical Conductivity	**230**	**mS/m**	B	150	300	400	
Turbidity	**36**	**NTU**	D	1	5	10	
Total Dissolved Solids (calc.)	**1385**	**mg/l**					6000
Total Suspended Solids	**52**	**mg/l**					
P-Alkalinity as $CaCO_3$	**50**	**mg/l**					
Total Alkalinity as $CaCO_3$	**270**	**mg/l**					
Total Hardness as $CaCO_3$	**553**	**mg/l**	B	300	650	1300	
Ca-Hardness as $CaCO_3$	**67**	**mg/l**	A	375	500	1000	2500
Mg-Hardness as $CaCO_3$	**486**	**mg/l**	C	290	420	840	2057
Chloride as Cl^-	**403**	**mg/l**	B	250	600	1200	1500-3000
Fluoride as F^-	**0.2**	**mg/l**	A	1.5	2.0	3.0	2.0-6.0
Sulphate as SO_4^{2-}	**325**	**mg/l**	B	200	600	1200	1000
Nitrate as N	**6.5**	**mg/l**	A	10	20	40	100
Nitrite as N	**0.06**	**mg/l**					10
Ammonia nitrogen as N	**<0.02**	**mg/l**					
Sodium as Na	**248**	**mg/l**	B	100	400	800	2000
Potassium as K	**73**	**mg/l**	A	200	400	800	
Magnesium as Mg	**118**	**mg/l**	C	70	100	200	500
Calcium as Ca	**27**	**mg/l**	A	150	200	400	1000
Manganese as Mn	**<0.01**	**mg/l**	A	0.05	1.0	2.0	10
Iron as Fe	**0.20**	**mg/l**	B	0.1	1.0	2.0	10
Stability pH, at 25°C	**7.7**						
Langelier Index	**1.4**	scaling		>0=scaling, <0=corrosive, 0=stable			
Ryznar Index	**6.2**	scaling		<6.5=scaling, >7,5=corrosive, ≥6.5 and ≤7.5=stable			
Corrosivity ratio	**3.4**	increasing corrosive tendency		Applies to water in the pH range 7-8 which also contains dissolved oxygen ratios <0.2 no corrosive properties ratios >0.2 increasing corrosive tendency			

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Sample details	water sample
Location of sampling point	-
Description of sampling point	WB-H2O-4
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/2

Parameter	Dissolved Metals* Value	Units	Parameter	Dissolved Metals* Value	Units
Lithium as Li	154	µg/l	**Magnesium as Mg**	126664	µg/l
Beryllium as Be	< 0.329	µg/l	**Aluminium as Al**	12	µg/l
Boron as B	414	µg/l	**Silicon as Si**	25937	µg/l
Strontium as Sr	204	µg/l	**Phosphorous as P**	2553	µg/l
Zirconium as Zr	< 0.045	µg/l	**Sulphur as S**	107346	µg/l
Molybdenum as Mo	15	µg/l	**Calcium as Ca**	28382	µg/l
Cadmium as Cd	0.07	µg/l	**Titanium as Ti**	< 0.442	µg/l
Tin as Sn	0.3	µg/l	**Vanadium as V**	7.1	µg/l
Antimony as Sb	5.4	µg/l	**Chromium as Cr**	2.1	µg/l
Tellurium as Te	< 0.273	µg/l	**Manganese as Mn**	0.67	µg/l
Barium as Ba	23	µg/l	**Iron as Fe**	8.3	µg/l
Lanthanum as La	0.02	µg/l	**Cobalt as Co**	105	µg/l
Tungsten as W	198	µg/l	**Nickel as Ni**	1.7	µg/l
Iridium as Ir	< 0.012	µg/l	**Copper as Cu**	13	µg/l
Platinum as Pt	< 0.019	µg/l	**Zinc as Zn**	1.6	µg/l
Gold as Au	0.08	µg/l	**Potassium as K**	>	µg/l
Mercury as Hg	1.8	µg/l	**Arsenic as As**	13	µg/l
Thallium as Tl	0.12	µg/l	**Selenium as Se**	3	µg/l
Lead as Pb	0.23	µg/l	**Ruthenium as Ru**	0.12	µg/l
Bismuth as Bi	0.02	µg/l	**Rhodium as Rh**	< 0.031	µg/l
Thorium as Th	0	µg/l	**Palladium as Pd**	< 0.517	µg/l
Uranium as U	3.4	µg/l	**Silver as Ag**	< 0.1	µg/l
Sodium as Na	>	µg/l			

Remark: * = outsourced to Lab'O'Link, South Africa

<LOD
>LOD <HighStd
>HighStd <1Order
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Sample acceptance: Sample was collected in clients' own bottle.
Sample was suitable for testing

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0-1.0 mg/l fluoride: no adverse health effects or tooth damage occurs

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Hardness: Depending on the interaction of other factors, such as, pH and alkalinity, water with a hardness above approximately 200 mg/l may cause scale deposition in the pipe work and tanks. On heating, hard waters form deposits of calcium carbonate scale.
pH: Optimum pH 6.5-8.
pH does not exert direct health effects, but may exert indirect health effects via metal solubility.
Sodium: The average taste threshold for sodium is about 200 mg/l.
Sulphate: It is generally considered that the taste impairment is minimal at levels below 250 mg/l.
Magnesium: The average taste threshold for magnesium is about 70 mg/l
Total dissolved solids: The palatability of water with a TDS level of less than 600 mg/l is generally considered to be good; drinking water becomes significantly and increasingly unpalatable at TDS levels greater than about 1000 mg/l.

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Date received: 28/Sep/21
Date analysed: 1 October - 6 October 2021
Date reported: 13/Oct/21

Client Reference no.: verbal
Quotation no.: QU-6721
Lab Reference: I211753
Enquiries: Ms Manuela Mayer

Sample details	water sample
Location of sampling point	-
Description of sampling point	KR-H2O-1
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/3

				Recommended maximum limits			
				Human consumption			Livestock
Parameter	**Value**	**Units**	**Classification**	**Group A**	**Group B**	**Group C**	**watering**
p H	**9.1**		A	6-9	5.5-9.5	4-11	
Electrical Conductivity	**129.5**	**mS/m**	A	150	300	400	
Turbidity	**32**	**NTU**	D	1	5	10	
Total Dissolved Solids (calc.)	**729**	**mg/l**					6000
Total Suspended Solids	**40**	**mg/l**					
P-Alkalinity as $CaCO_3$	**25**	**mg/l**					
Total Alkalinity as $CaCO_3$	**285**	**mg/l**					
Total Hardness as $CaCO_3$	**311**	**mg/l**	B	300	650	1300	
Ca-Hardness as $CaCO_3$	**19**	**mg/l**	A	375	500	1000	2500
Mg-Hardness as $CaCO_3$	**292**	**mg/l**	B	290	420	840	2057
Chloride as Cl^-	**210**	**mg/l**	A	250	600	1200	1500-3000
Fluoride as F^-	**0.1**	**mg/l**	A	1.5	2.0	3.0	2.0-6.0
Sulphate as SO_4^{2-}	**93**	**mg/l**	A	200	600	1200	1000
Nitrate as N	**<0.5**	**mg/l**	A	10	20	40	100
Nitrite as N	**0.02**	**mg/l**					10
Ammonia nitrogen as N	**<0.02**	**mg/l**					
Sodium as Na	**125**	**mg/l**	B	100	400	800	2000
Potassium as K	**51**	**mg/l**	A	200	400	800	
Magnesium as Mg	**71**	**mg/l**	B	70	100	200	500
Calcium as Ca	**7.6**	**mg/l**	A	150	200	400	1000
Manganese as Mn	**<0.01**	**mg/l**	A	0.05	1.0	2.0	10
Iron as Fe	**0.08**	**mg/l**	A	0.1	1.0	2.0	10
Stability pH, at 25°C	**8.2**						
Langelier Index	**0.9**	scaling		>0=scaling, <0=corrosive, 0=stable			
Ryznar Index	**7.2**	stable		<6.5=scaling, >7,5=corrosive, ≥6.5 and ≤7.5=stable			
Corrosivity ratio	**1.4**	increasing corrosive tendency		Applies to water in the pH range 7-8 which also contains dissolved oxygen ratios <0.2 no corrosive properties ratios >0.2 increasing corrosive tendency			

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Client Reference no.: verbal
Quotation no.: QU-6721
Lab Reference: I211753
Enquiries: Ms Manuela Mayer

Sample details	water sample
Location of sampling point	-
Description of sampling point	KR-H2O-1
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/3

Parameter	Dissolved Metals* Value	Units	Parameter	Dissolved Metals* Value	Units
Lithium as Li	95	µg/l	**Magnesium as Mg**	93357	µg/l
Beryllium as Be	< 0.329	µg/l	**Aluminium as Al**	9.5	µg/l
Boron as B	354	µg/l	**Silicon as Si**	31945	µg/l
Strontium as Sr	40	µg/l	**Phosphorous as P**	27	µg/l
Zirconium as Zr	0.1	µg/l	**Sulphur as S**	38093	µg/l
Molybdenum as Mo	11	µg/l	**Calcium as Ca**	5635	µg/l
Cadmium as Cd	< 0.04	µg/l	**Titanium as Ti**	< 0.442	µg/l
Tin as Sn	< 0.223	µg/l	**Vanadium as V**	5.3	µg/l
Antimony as Sb	2.8	µg/l	**Chromium as Cr**	1.3	µg/l
Tellurium as Te	< 0.273	µg/l	**Manganese as Mn**	0.39	µg/l
Barium as Ba	48	µg/l	**Iron as Fe**	4.4	µg/l
Lanthanum as La	0.01	µg/l	**Cobalt as Co**	27	µg/l
Tungsten as W	106	µg/l	**Nickel as Ni**	1.2	µg/l
Iridium as Ir	< 0.012	µg/l	**Copper as Cu**	3.8	µg/l
Platinum as Pt	< 0.019	µg/l	**Zinc as Zn**	1.9	µg/l
Gold as Au	0.07	µg/l	**Potassium as K**	>	µg/l
Mercury as Hg	1.7	µg/l	**Arsenic as As**	11	µg/l
Thallium as Tl	0.1	µg/l	**Selenium as Se**	0.97	µg/l
Lead as Pb	0.11	µg/l	**Ruthenium as Ru**	0.09	µg/l
Bismuth as Bi	0.02	µg/l	**Rhodium as Rh**	< 0.031	µg/l
Thorium as Th	< 0.002	µg/l	**Palladium as Pd**	< 0.517	µg/l
Uranium as U	14	µg/l	**Silver as Ag**	< 0.1	µg/l
Sodium as Na	>	µg/l			

Remark: * = outsourced to Lab'O'Link, South Africa

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0-1.0 mg/l fluoride: no adverse health effects or tooth damage occurs

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Nitrate and nitrite: In water it has been associated with methaemoglobinaemia, especially in bottle-fed infants
0-6 mg/l nitrate as N: no adverse health effects

Some of the naturally occurring chemicals which occur in drinking water at concentrations below those at which toxic effects may occur.
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Hardness: Depending on the interaction of other factors, such as, pH and alkalinity, water with a hardness above approximately 200 mg/l may cause scale deposition in the pipe work and tanks. On heating, hard waters form deposits of calcium carbonate scale.
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Sodium: The average taste threshold for sodium is about 200 mg/l.
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Quotation no.: QU-6721
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Enquiries: Ms Manuela Mayer

Sample details	water sample
Location of sampling point	-
Description of sampling point	KR-H2O-2
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/4

				Recommended maximum limits			
				Human consumption			Livestock
Parameter	**Value**	**Units**	**Classification**	**Group A**	**Group B**	**Group C**	**watering**
p H	**9.3**		A	6-9	5.5-9.5	4-11	
Electrical Conductivity	**165.1**	**mS/m**	B	150	300	400	
Turbidity	**131**	**NTU**	D	1	5	10	
Total Dissolved Solids (calc.)	**905**	**mg/l**					6000
Total Suspended Solids	**252**	**mg/l**					
P-Alkalinity as $CaCO_3$	**50**	**mg/l**					
Total Alkalinity as $CaCO_3$	**285**	**mg/l**					
Total Hardness as $CaCO_3$	**384**	**mg/l**	B	300	650	1300	
Ca-Hardness as $CaCO_3$	**13**	**mg/l**	A	375	500	1000	2500
Mg-Hardness as $CaCO_3$	**371**	**mg/l**	B	290	420	840	2057
Chloride as Cl^-	**293**	**mg/l**	B	250	600	1200	1500-3000
Fluoride as F^-	**0.6**	**mg/l**	A	1.5	2.0	3.0	2.0-6.0
Sulphate as SO_4^{2-}	**117**	**mg/l**	A	200	600	1200	1000
Nitrate as N	**<0.5**	**mg/l**	A	10	20	40	100
Nitrite as N	**0.06**	**mg/l**					10
Ammonia nitrogen as N	**0.02**	**mg/l**					
Sodium as Na	**163**	**mg/l**	B	100	400	800	2000
Potassium as K	**65**	**mg/l**	A	200	400	800	
Magnesium as Mg	**90**	**mg/l**	B	70	100	200	500
Calcium as Ca	**5.3**	**mg/l**	A	150	200	400	1000
Manganese as Mn	**<0.01**	**mg/l**	A	0.05	1.0	2.0	10
Iron as Fe	**0.58**	**mg/l**	B	0.1	1.0	2.0	10

Stability pH, at 25°C	**8.3**		
Langelier Index	**1.0**	scaling	>0=scaling, <0=corrosive, 0=stable
Ryznar Index	**7.3**	stable	<6.5=scaling, >7,5=corrosive, ≥6.5 and ≤7.5=stable
Corrosivity ratio	**1.9**	increasing corrosive tendency	Applies to water in the pH range 7-8 which also contains dissolved oxygen ratios <0.2 no corrosive properties ratios >0.2 increasing corrosive tendency

Approved Technical Signatory
Ms. Manuela Mayer

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Unit 16, Ben Amathila Ave.

PO Box 86782, Windhoek, Namibia

TEST REPORT

To: **Omavi Geotechnical Consultants**
P.O. Box 1642
Windoek

Attn: Etuna
e-mail: info@omavi.com.na
Tel: 081-478 6303

Date received: 28/Sep/21
Date analysed: 1 October - 6 October 2021
Date reported: 13/Oct/21

Client Reference no.: verbal
Quotation no.: QU-6721
Lab Reference: I211753
Enquiries: Ms Manuela Mayer

Sample details	water sample
Location of sampling point	-
Description of sampling point	KR-H2O-2
Date of sampling	2021/09/24; 9:00-14:00
Test item number	I211753/4

Parameter	Dissolved Metals* Value	Units	Parameter	Dissolved Metals* Value	Units
Lithium as Li	36	µg/l	**Magnesium as Mg**	73688	µg/l
Beryllium as Be	< 0.329	µg/l	**Aluminium as Al**	9.6	µg/l
Boron as B	297	µg/l	**Silicon as Si**	31354	µg/l
Strontium as Sr	61	µg/l	**Phosphorous as P**	19	µg/l
Zirconium as Zr	0.1	µg/l	**Sulphur as S**	30967	µg/l
Molybdenum as Mo	10	µg/l	**Calcium as Ca**	7922	µg/l
Cadmium as Cd	< 0.04	µg/l	**Titanium as Ti**	< 0.442	µg/l
Tin as Sn	0.48	µg/l	**Vanadium as V**	4.6	µg/l
Antimony as Sb	2.5	µg/l	**Chromium as Cr**	1.3	µg/l
Tellurium as Te	< 0.273	µg/l	**Manganese as Mn**	0.44	µg/l
Barium as Ba	40	µg/l	**Iron as Fe**	3.4	µg/l
Lanthanum as La	0.01	µg/l	**Cobalt as Co**	4.5	µg/l
Tungsten as W	13	µg/l	**Nickel as Ni**	1	µg/l
Iridium as Ir	< 0.012	µg/l	**Copper as Cu**	11	µg/l
Platinum as Pt	< 0.019	µg/l	**Zinc as Zn**	1.9	µg/l
Gold as Au	0.07	µg/l	**Potassium as K**	>	µg/l
Mercury as Hg	1.3	µg/l	**Arsenic as As**	11	µg/l
Thallium as Tl	0.06	µg/l	**Selenium as Se**	< 0.932	µg/l
Lead as Pb	0.13	µg/l	**Ruthenium as Ru**	< 0.031	µg/l
Bismuth as Bi	0.01	µg/l	**Rhodium as Rh**	< 0.031	µg/l
Thorium as Th	0	µg/l	**Palladium as Pd**	< 0.517	µg/l
Uranium as U	1.2	µg/l	**Silver as Ag**	< 0.1	µg/l
Sodium as Na	>	µg/l			

Remark: * = outsourced to Lab'O'Link, South Africa

<LOD
>LOD <HighStd
>HighStd <1Order
>1Order

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Remark: Overall classification of water, considering only constituents that have been tested for: Group D, high risk water. Unsuitable for human consumption.

Interpretation based on guidelines for the evaluation of drinking water for human consumption, DWA, Namibia, April 1988 and South African Water Quality Guidelines Volume 5: Agricultural water use: Livestock watering, Second Edition, 1996

For practical reasons, the guidelines are divided into four groups.
The highest group assigned to any of the constituents determines the classification of the water as a whole.
Group A: excellent quality water
Group B: good quality water
Group C: low risk water
Group D: high risk or water unsuitable for human consumption

Ideally water should be either Group A or Group B. If water is classified as Group C, the situation is not yet critical, but attention should be given to those constituents over the Group B limit. If however, the water is classified as Group D urgent and immediate attention is required to reduce the levels of the problem constituents in the water to suitable levels.

Sample acceptance: Sample was collected in clients' own bottle.
Sample was suitable for testing

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Assessment of water quality for human consumption

Naturally occurring chemicals that are of health significance in drinking water
Fluoride: Exposure to high levels of fluoride, which occurs naturally, can lead to mottling of teeth and, in severe cases, crippling skeletal fluorosis.
0-1.0 mg/l fluoride: no adverse health effects or tooth damage occurs

Chemicals from agricultural activities that are of health significance in drinking water
Nitrate and nitrite: In water it has been associated with methaemoglobinaemia, especially in bottle-fed infants
0-6 mg/l nitrate as N: no adverse health effects

Some of the naturally occurring chemicals which occur in drinking water at concentrations below those at which toxic effects may occur.
Chloride: high concentrations of chloride give a salty taste to water. Concentrations in excess of 250 mg/l are increasingly likely to be detected by taste.
Hardness: Depending on the interaction of other factors, such as, pH and alkalinity, water with a hardness above approximately 200 mg/l may cause scale deposition in the pipe work and tanks. On heating, hard waters form deposits of calcium carbonate scale.
pH: Optimum pH 6.5-8.
pH does not exert direct health effects, but may exert indirect health effects via metal solubility.
Sodium: The average taste threshold for sodium is about 200 mg/l.
Sulphate: It is generally considered that the taste impairment is minimal at levels below 250 mg/l.
Magnesium: The average taste threshold for magnesium is about 70 mg/l
Total dissolved solids: The palatability of water with a TDS level of less than 600 mg/l is generally considered to be good; drinking water becomes significantly and increasingly unpalatable at TDS levels greater than about 1000 mg/l.

Turbidity is a measure of the light-scattering ability of water and is indicative of the concentration of suspended matter in water.
Microorganisms are often associated with turbidity, hence low turbidity minimises the potential for transmission of infectious diseases. Turbidity also affects the aesthetic quality of water.
Turbidity in water is caused by the presence of suspended matter which usually consists of a mixture of inorganic matter, such as clay and soil particles and organic matter.
Turbidity may also be associated with the presence of inorganic ions such as manganese(II) and iron(II).
The consumption of turbid water *per se* does not have any direct health effects, but associated effects due to microbial contamination or the ingestion of substances bound to particulate matter, do.
Aesthetic effects (appearance, taste, odour) of turbidity can be mitigated or removed by decantation or by filtration (or by both), accelerated, if necessary, by previous aeration

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Summary of test methods - Water Quality

Determinant	Unit	DL	Technique	Method reference
Absorbed oxygen	mg/l O_2	1	titrimetric	SANS 5220:2005
Acidity	mg/l $CaCO_3$	20	titrimetric	AWWA 2310 B
Alkalinity	mg/l $CaCO_3$	20	titrimetric	AWWA 2320 B
Ammonium	mg/l N	0.02	colorimetric	AWWA 4500-NH_3 F / modified Berthelot
Bicarbonate & Carbonate	mg/l $CaCO_3$	1	by calculation	
Biological oxygen demand, 5-day	mg/l O_2	2	electrometric	AWWA 5210 B
Biological oxygen demand, carbonacious	mg/l O_2	2	electrometric	AWWA 5210 B
Bromide & Iodide	mg/l Br^-	0.01	iodometric	P. Höfer
Chloride	mg/l Cl^-	1	argentometric	AWWA 4500-Cl^- B
Chlorine, free and total	mg/l Cl_2	0.05	colorimetric	AWWA 4500-Cl G
Chlorophyll a	µg/L	0.01	spectrophotometric	ISO 10260:1992 E
Chemical oxygen demand	mg/l O_2	1	colorimetric	AWWA 5220 D
Colour	Pt	10	colorimetric	AWWA Pt-Co-2120 B
Cyanide	mg/l CN	0.02	colorimetric	AWWA 4500-CN E
Density	mg/l g/ml	-	gravimetric	METH W 016
Dissolved oxygen	mg/l O_2	0.1	electrometric	AWWA 4550-O G
Electrical conductivity	mS/m	0.1	electrometric	AWWA 2510 B
Fat, oil & grease	mg/l	1	extraction/gavimetric	AWWA 5520 B
Fixed and volatile solids, ignited at 550°C	mg/l	1	gravimetric	AWWA 2540 E
Fluoride	mg/l F^-	0.1	electrometric	AWWA 4500-F C
Hardness	mg/l $CaCO_3$	1	by calculation	AWWA 2340 B
Hexavalent chromium	mg/l Cr	0.02	colorimetric	AWWA 3500-Cr B
Hydrolysable phosphates	mg/l P	0.01	digestion, PO4	AWWA 4500-P B.2 + E
Kjeldahl nitrogen	mg/l N	0.5	by calculation	
Molybdosilicate	mg/l SiO_2	0.4	colorimetric	AWWA 4500-Si C
Nitrate	mg/l N	0.5	colorimetric	Spectroquant / AWWA 4500-NO_3 E
Nitrite	mg/l N	0.01	colorimetric	AWWA 4500-NO2 B
Oxidation reduction potential (Redox)	mV	-	electrometric	AWWA 2580 B
pH		-	electrometric	AWWA 4500-H^+ B
Phenols	mg/l Phenol	0.05	colorimetric	ASTM D1783-01, B
Reactive phosphorous	mg/l PO_4	0.03	colorimetric	AWWA 4500-P E
Settable solids	mg/l	1	gravimetric	AWWA 2540 F
Sulfide	mg/l S^{2-}	0.05	colorimetric	AWWA 4500-S^{2-} D
Sulfite	mg/l SO_3^{2-}	2	iodometric	AWWA 4500-SO_3^{2-} B
Sulphate	mg/l SO_4	1	nephelometric / colorimetric	AWWA 4500-SO4 E / F
Total dissolved solids	mg/l	1	gravimetric	AWWA 2540 C
Total nitrogen	mg/l N	0.5	digestion, NO3	EN ISO 11905-1:1997
Total phosphorous	mg/l P	0.01	digestion, PO4	AWWA 4500-P B.5 + E
Total solids	mg/l	1	gravimetric	AWWA 2540 B
Total suspended solids	mg/l	1	gravimetric	AWWA 2540 D
Turbidity	NTU	0.05	nephelometric	AWWA 2130 B
UV absorbing organic constituents at 254nm	cm^{-1}	-	colorimetric	AWWA 5910 B

Aluminium	mg/l Al	0.01		AWWA ICP-3500-Al C
Antimony	mg/l Sb	0.01		AWWA ICP-3500-Sb C
Arsenic	mg/l As	0.01		AWWA ICP-3500-As D
Barium	mg/l Ba	0.01		AWWA ICP-3500-Ba C
Beryllium	mg/l B	0.01		AWWA ICP-3500-Be
Bismuth	mg/l Bi	0.01		AWWA ICP-3500-Bi
Boron	mg/l B	0.01		AWWA ICP-3500-B D
Cadmium	mg/l Cd	0.01		AWWA ICP-3500-Cd C

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Calcium	mg/l Ca	0.1		AWWA ICP-3500-Ca C
Chromium (total)	mg/l Cr	0.01		AWWA ICP-3500-Cr C
Cobalt	mg/l Co	0.01		AWWA ICP-3500-Co C
Copper	mg/l Cu	0.01		AWWA ICP-3500-Cu C
Gold	mg/l Au	0.01		AWWA ICP-3500-Au
Iron	mg/l Fe	0.01		AWWA ICP-3500-Fe C
Lead	mg/l Pb	0.01		AWWA ICP-3500-Pb C
Lithium	mg/l Li	0.01		AWWA ICP-3500-Li C
Magnesium	mg/l Mg	0.1		AWWA ICP-3500-Mg C
Manganese	mg/l Mn	0.01		AWWA ICP-3500-Mn C
Mercury	mg/l Hg	0.01		AWWA ICP-3500-Hg
Molybdenum	mg/l Mo	0.01		AWWA ICP-3500-Mo C
Nickel	mg/l Ni	0.01		AWWA ICP-3500-Ni C
Potassium	mg/l K	0.1		AWWA ICP-3500-K C
Rubidium	mg/l Rb	0.01		ICP-OES
Selenium	mg/l Se	0.01		AWWA ICP-3500-Se I
Silica	mg/l Si	0.01		ICP-OES
Silver	mg/l Ag	0.01		AWWA ICP-3500-Ag
Sodium	mg/l Na	0.1		AWWA ICP-3500-Na C
Strontium	mg/l Sr	0.01		AWWA ICP-3500-Sr C
Thallium	mg/l Th	0.01		AWWA ICP-3500-Tl C
Tellurium	mg/l Te	0.01		AWWA ICP-3500-Te
Tin	mg/l Sn	0.01		AWWA ICP-3500-Sn
Titanium	mg/l Ti	0.01		AWWA ICP-3500-Ti
Uranium	mg/l U	0.01		AWWA ICP-3500-U
Vanadium	mg/l V	0.01		AWWA ICP-3500-V C
Zinc	mg/l Zn	0.01		AWWA ICP-3500-Zn C

Lower reporting limit
These are estimated values only; accurate lower levels of detection (LLDs) (measurement as part of a method) and method detection levels (MDLs) (measurement for the whole method) still have to be established
Given the varied matrices submitted to the laboratory and divers quality needs method and/or reagent blanks, performance evaluation samples and duplicate results may be included to assist in appropriate use of laboratory data.

All submitted samples are initially run undiluted unless sample dilutions are required in order to reduce or eliminate known matrix / interference effects. When an analyte concentration exceeds the calibration or linear range, the sample is re-analysed after appropriate dilution. The analyst will use the least dilution necessary to bring the analyte within the range. In both cases, a loss of sensitivity is experienced. All sample dilutions result in an increase in the lower reporting limit by a factor equal to the dilution. The less than symbol "<" is used for qualified data below the lower reporting limit.

APPENDIX E – LIST OF IDENTIFIED AND REGISTERED INTERESTED AND AFFECTED PARTIES

Stakeholders List

Project Proponent: Marmorwerke Karibib

	Organisation	Contact person	Department/Position/Affiliation
SEA/ EIA Proj	Omavi Geotechnical & Geo-Environmental Consultants		Environmental Management & Compliance

	Organisation	Contact person	Department/Position
Central Government	Ministry of Environment and Tourism	Theo Nghithila	Executive Director
		Timoteus Mufeti	Environmental Commissioner
		Caroline Garus-oas	Deputy Environmental Commissioner
		Saima Angula	Deputy Director: Environmental Assessment, Waste Management, Pollution Control and Inspections
	Ministry of Agriculture, Water & Land Reform	Mr. Percy Misika	Executive Director
		Mrs/ Ms. Paulina Mufeti	Deputy Director: Hydrology
		M. Amakali	Director : Water Resource Management
		Mrs. Josephine Iitengula	Hydrogeologist
		Victor Slinger	Deputy Director - Directorate of Water Supply and Sanitation Coordina
		Margaret Kalo	Senior Public Relations Officer
	Ministry of Mines & Energy	Mr. Simeon Negumbo	Executive Director
		Erasmus Shivolo	Mining Commisioner
		Mr. John Titus	Director: Energy
		Mr. Daniel Zaire	Deputy Director: Electricity Division
		Mr Abraham Hangula	Deputy Director of Energy Planning and Research
		Mrs. Isabella Kandjii-Chirchir	Deputy Director (Mining)
		Mathews Amunghete	Chief Inspector of Mines
	Ministry of Urban and Rural Development	Nghidinua Daniel	Executive Director
		Niita Iipinge	Dep. Director: Resettlement
	Ministry of Industrialisation and Trade	Mr. Sikongo Haihambo	Executive Director
			Department of Industrial Development:

	Organisation	Contact person	Department/Position/Affiliation
			Office of Public relation and communication:
Regional GRN	Erongo Regional Council	Neville Adre	Govenor
		Ms Ludmilla H Doeses	Chief Regional Officer
		Mrs. Kauari	Director - Directorate of Planning & Development Services
		Mr Meroro	Deputy Director - Directorate of Planning & Development Services
		Ms Dimari Van Rensburg	Town and Regional Planner
		Ms. Annette Dennis	Private Secretary - Directorate of Planning & Development Services
	Karibib Constituency Office	Hon. Melanie Ndjago	Karibib Constituency Councillor
		Mrs. Katrina Shikongo	
	Organisation	**Contact person**	**Department/Position/Affiliation**
Local GRN	Karibib Town Council	Mr. Lesley Goreseb	CEO
		Ms. Sara Ilovu	Manager Local Economic Development, Environmental Health & Corpc
		Mr. Siegfried Au-khaob	Environmental Officer
		Mrs Emely Tjombumbi	Manager: Planning and Technical Services
		Mrs. Selma Nghifindaka	Town Planner
		Mrs. Evita Bertoni	Personal Assistant to CEO
	Organisation	**Contact person**	**Department/Position/Affiliation**
arastatals	Namwater	Johannes K Shigwedha	Corporate Communications manager
		Fillemon Aupokolo	Environmentalist
	Roads Authority	Eugene de Paauw	Network and Planning Consultation
		Elina Lumbu	Head: Legal
	Local Authorities Namibia (ALAN)		
	Nampower	Mr. Simson Haulofa	Managing Director
		Mr. Calvin Sisamu	Head: Environmental Affairs
		Mr. Edison Hiwanaame	Environmentalist
	National Heritage Council of Namibia	Mrs Erica Nalikokule	Director
		Mr Manfred Gaeb	Archaeology/ Heritage Officer
		Ms Agnes Tshiningayamwe	Archaeology/ Heritage Officer

Pa	Namibia Chamber of Mines	Veston Malango	CEO
	National Botanical Research Institute	Venessa Stein	Forester
	Transnamib	Mr Ferdinand Ganaseb	Executive: Engineering & Technical Services
		Ms Anneline Black	Executive: Operations
	Erongo Red	Mr. F Mbango	CEO
		Mr. Nico Niemand	Executive Manager: Network Operations and Maintenance
	NCCI	Charity Mwiya	

	Organisation	Contact person	Department/Position/Affiliation
I &APs	Karibib Farmers Association	Mr Cash Van Wyk	Chairman
	Karibib Farmers Association	Mrs Doris Gladis	Secretary
	Navachab Gold Mine	M Bell	Navachab Mine - Safety & Environmental Manager
		K. Avia	Navachab Mine - Mine Manager
	Rossing Foundation	Uusiku Lysias	Coordinator
	Mining and Construction Entrepreneur	Alfred Sanekavo George	Mining and Construction Entrepreneur

APPENDIX F – NEWSPAPER ADVERTS/ NOTICES/ PROOF OF CONSULTATIONS FOR THE ENVIRONMENTAL ASSESSMENT PROCESS

Market Watch Kleinadvertensies • Classifieds

SPERTYE: 13:00 TWEE WERKSDAE VOOR PLASING
DEADLINES: 13:00 TWO WORKING DAYS PRIOR TO PLACEMENT

TEL: 061-297 2055 **FAX:** 061-239 638
EMAIL: classifieds@republikein.com.na

Geen advertensies sal telefonies aanvaar word nie.

No advertisements will be accepted telephonically.

INHOUDSOPGAWE

CONTENTS

RATES & DEADLINES

To avoid disappointment of an advertisement not appearing on the date you wish, please book timeously. Classified smalls, notices and display smalls: 13:00, two working days prior to placing.
A handling fee of 15% is payable on cancellations received in writing by 13:00 two days before scheduled publication. No cancellation will be accepted if received after this deadline.

RATES:
(Monday - Friday)

- Classifieds Smalls: N$95.45 for the first 20 words and N$2.40 (15% Vat included) for every word thereafter
- Display Smalls: N$108.10 per col/cm (15% Vat included)
- School notices: N$66.70 (15% Vat included) per col/cm
- Churches: N$66.70 (15% Vat included) per col/cm
- Sport Clubs: N$66.70 (15% Vat included) per col/cm
- Births, engagements, marriages, deaths, In memoriam: N$66.70 (15% Vat included) per col/cm
- Legal Notices: N$633.65 for the first 300 words and N$2.40 (15% Vat included) for every word thereafter

CONDITIONS OF ACCEPTANCE:
Republikein reserves the right to withhold or cancel any advertisement order that has been accepted. Republikein accepts no liability for failure to publish an advertisement received by telephone.

ERRORS:
Please report errors immedi-ately. Republikein accepts no responsibility for more than one incorrect insertion of any advertisement of any cost beyond the cost of the space occupied by the faulty advertisement. No re-publication will be given due to small typographical errors which do not lessen the effectiveness of the advertisement. Republikein does not accept responsibility for mispresentation in advertisements.

BOOK & PAY FOR YOUR CLASSIFIED ADS ONLINE

Visit https://classifieds.my.na - log in via your my.na account and follow the easy steps to upload your classified ad.

TODAY IS...

WORLD SKETCHNOTE DAY

World Sketchnote Day celebrates the uniqueness in sketchnoting and provides insight into what visual learners can accomplish with their notes

008 Betrekkings gevra Employment Wanted

SISKIA (45) is op soek na huiswerk vir die hele week. Het ondervinding. Skakel 081-4406396.
DM0202200397058

MIRJAM (40) is looking for domestic work for Mondays, Wednesdays and Fridays. Has 10 years experience. Call 081-3777851.
DM0202200397059

ERNA is looking for caretaking work. Is competent, experienced and has a certificate. Call 081-4129654.
DM0202200397065

016 Te huur To Let

BACHELOR FLAT, outside in yard - for rent in new Cimbebasia. Consisting of bedroom with built-in cupboards, shower/toilet, kitchen, burglar bars, clean. N$4 500. Call 081-2401919.
DM0202200397055

023 Diere Animals

6 MALE BEAGLE PUPPIES for sale - N$3 500. Includes vaccinations and transport to Windhoek. Chantel 081-7479885.
DM0202200397066

035 Regskennisgewings Legal Notices

PUBLIC NOTICE FOR THE RENEWAL OF AN ENVIRONMENTAL CLEARANCE CERTIFICATE – Continued Operation of the Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands.
In accordance with the Environ mental Management Act, 2007, (Act No. 7 of 2007) & the EIA Regulations 30 of 2012, industrial processing of dimension stones and disposal of solid sludge generated from the cutting and grinding of natural stone are listed activities which cannot be carried out without an Environmental Clearance Certificate (ECC) from the Department of Environmental Affairs & Forestry (DEAF). OMAVI Geotechnical & Geo-environmental Consultants has been appointed to undertake an Environmental Overview Study& prepare an updated Environmental Management Plan to support the renewal for ECC.
Proponent: Marmorwerke Karibib (Pty) Ltd
Site Locality: Both the natural stone processing facility and the abandoned borrow pit to be reclaimed and rehabilitated are located within the Karibib Townlands. A locality map is available on request from OMAVI.
In terms of the requirements of the EIA Regulations, all Interested & affected Parties (I&APs) must be provided with opportunities to participate in the Environmental Overview process. I&APs are therefore, hereby invited to register & submit written comments/ concerns/ suggestions by close of business on 12th February 2022. A Background Information Document is available to I&APs upon registration.
A public consultation meeting is tentatively scheduled for 29 January 2022; meeting Time and Venue shall be communicated with registered I&APs only.
Tel: +264 81 478 6303
(SMSes or WhatsApp Texts preferred for record keeping purpose)
Email: enviro@omavi.com.na
DM0202200397067

035 Regskennisgewings Legal Notices

IN THE High Court of Namibia
Case No. HC-MD-CIV-ACT-CON-2018/02895
In the matter between:
STANDARD BANK NAMIBIA LTD, Plaintiff and
MELVIN LEVY CLOETE, Defendant
NOTICE OF SALE IN EXECUTION OF IMMOVABLE PROPERTY
In Execution of a Judgment of the above Honourable Court in the above mentioned suit, a sale will be held on Tuesday, the 25th of January 2022 at 12:00, Erf No 2182, Walvis Bay.
CERTAIN: Erf No 2182, Narraville
SITUATED: In the town of Walvis Bay, Erongo Region, Registration Division "F"
MEASURING: 694 (six nine four) square metres
HELD BY: Deed of Transfer No T 2046/2016
SUBJECT: to the following terms and conditions contained therein:
ALLEGED IMPROVEMENTS
DESCRIPTION the following improvements are on the property (although nothing in this respect is guaranteed). The building comprising of:
HOUSE: 1x Single garage, 1x TV-room, 1x kitchen (with tiles), 1x foyer (with tiles), 1x bedroom with bath (with tiles), 1x bedroom (with tiles), 1x bedroom(with tiles) 1x guest toilet / bathroom with toilet.
FLAT 1: 1x Open plan living room /kitchen, 1x shower, 1x courtyard.
FLAT 2: 1x front courtyard, 1x open plan living/kitchen with tiles, 2x bedrooms with tiles, 1x bathroom with bath (with tiles), back courtyard.
FLAT 3: Front courtyard, 1x open plan living/kitchen with tiles, 2x bedrooms with tiles, 1x bathroom with bath (with tiles), 1x back courtyard, 1x drive-way to the flats, 1x front courtyard.
1. The property shall be sold by the Deputy-Sheriff of WALVIS BAY subject to the Conditions of Sale that may be inspected at the Offices of the Deputy-Sheriff to the highest bidder on the auction and furthermore subject to approval by the preferent claimant.
2. The sale is subject to the provisions of the High Court Act No 16 of 1990,as amended, and the property will be sold "voetstoots" according to the existing title deed.
3. 10% of the purchase price to be paid in cash on the date of the sale, the balance to be paid against transfer, to be secured by a Bank or Building Society or other acceptable guarantee to be furnished to the Deputy-Sheriff within 14 (fourteen) days after the date of Sale.
4. The full Conditions of Sale will be read out by the Deputy-Sheriff on the day of the sale, but may be inspected at any time prior to the sale at the offices of the Deputy-Sheriff or at the office of the Plaintiff's attorneys.
Dated at Windhoek this 14th day of December 2021.
ENGLING STRITTER & PARTNERS
Attorneys for Plaintiff
12 LOVE STREET
WINDHOEK
EY/bp/sd8373
DM0202100396609

IN THE High Court Of Namibia. CASE NO: HC-MD-CIV-ACT-CON-2021/01631.
In the matter between: FIRST NATIONAL BANK OF NAMIBIA LIMITED - PLAINTIFF and PATT TRADING ENTERPRISSES CC - 1st Defendant, PETRUS NGHIWANIFILWA - 2nd Defendant.
NOTICE OF SALE IN EXECUTION
Pursuant to a Judgment granted by the above Honourable Court, the following goods will be sold in execution by public auction by the Deputy Sheriff, OSHAKATI on the 27th day of January 2022at 12h00 at Advanced Refridgeration, Main Road, Oshakati, namely: 1 x Toyota Crown (Registration No.: N35140SH).
TERMS: CASH to the highest bidder.
Dated at Windhoek this 17th day of November 2021.
FISHER, QUARMBY & PFEIFER
Legal Practitioners for Plaintiff
Corner Robert Mugabe & Thorer Streets
WINDHOEK
Ref: GMcC/js/S6028
DM0202200397063

035 Regskennisgewings Legal Notices

IN THE High Court Of Namibia.
Case Number: HC-MD-CIV-ACT-CON-2020/02420.
In the matter between: STANDARD BANK NAMIBIA LIMITED - Plaintiff and NELSON NANDE VEHEKENI - Defendant.
NOTICE OF SALE IN EXECUTION OF IMMOVABLE PROPERTY
In Execution of a Judgment of the above Honourable Court in the above mentioned suit, a sale will be held on Tuesday, The 25th of January 2022 at 10:00 at Walvis Bay at Erf 5385, (Extension No 18), Walvis Bay:
CERTAIN: Erf 5385, Walvis Bay (Extension No 18).
SITUATED: In the Town Of Walvis Bay Erongo Region, Registration Division "F".
MEASURING: 443 (Four Four Three) Square Metres.
HELD BY: Deed of Transfer no T7947/2018.
SUBJECT: to the following terms and conditions therein,
ALLEGED IMPROVEMENTS
DESCRIPTION: the following improvements are on the property (although nothing in this respect is guaranteed). The building comprising of: 1x kitchen with double zink & built- in cabinets, 1x open plan living & dining room, 1x main bedroom with cupboards – passage to living room, 1x bathroom with toilet, wash basin, bath with tiles, 1x entry patio, 1x outside patio, 1x foyer, 1x garage.
1. The property shall be sold by the Deputy-Sheriff of WALVIS BAY subject to the Conditions of Sale that may be inspected at the Offices of the Deputy-Sheriff to the highest bidder on the auction and furthermore subject to approval by the preferent claimant.
2. The sale is subject to the provisions of the High Court Act No 16 of 1990, as amended, and the property will be sold "voetstoots" according to the existing title deed.
3. 10% of the purchase price to be paid in cash on the date of the sale, the balance to be paid against transfer, to be secured by a Bank or Building Society or other acceptable guarantee to be furnished to the Deputy-Sheriff within 14 (fourteen) days after the date of Sale.
4. The full Conditions of Sale will be read out by the Deputy-Sheriff on the day of the sale, but may be inspected at any time prior to the sale at the offices of the Deputy-Sheriff or at the office of the Plaintiff's attorneys.
Dated at Windhoek this day of November 2021.
ENGLING STRITTER & PARTNERS
Attorneys for Plaintiff
12 LOVE STREET
WINDHOEK
EY/bp/sd8716
DM0202200397064

Market Watch Kleinadvertensies • Classifieds

SPERTYE: 13:00 TWEE WERKSDAE VOOR PLASING
DEADLINES: 13:00 TWO WORKING DAYS PRIOR TO PLACEMENT

TEL: 061-297 2055 **FAX:** 061-239 638
EMAIL: classifieds@republikein.com.na

Geen advertensies sal telefonies aanvaar word nie.

No advertisements will be accepted telephonically.

INHOUDSOPGAWE CONTENTS

RATES & DEADLINES

To avoid disappointment of an advertisement not appearing on the date you wish, please book timeously. Classified smalls, notices and display smalls: 13:00, two working days prior to placing.
A handling fee of 15% is payable on cancellations received in writing by 13:00 two days before scheduled publication. No cancellation will be accepted if received after this deadline.

RATES:
(Monday - Friday)

- Classifieds Smalls: N$95.45 for the first 20 words and N$2.40 (15% Vat included) for every word thereafter
- Display Smalls: N$108.10 per col/cm (15% Vat included)
- School notices: N$66.70 (15% Vat included) per col/cm
- Churches: N$66.70 (15% Vat included) per col/cm
- Sport Clubs: N$66.70 (15% Vat included) per col/cm
- Births, engagements, marriages, deaths, In memoriam: N$66.70 (15% Vat included) per col/cm
- Legal Notices: N$633.65 for the first 300 words and N$2.40 (15% Vat included) for every word thereafter

CONDITIONS OF ACCEPTANCE:
Republikein reserves the right to withhold or cancel any advertisement order that has been accepted. Republikein accepts no liability for failure to publish an advertisement received by telephone.

ERRORS:
Please report errors immedi-ately. Republikein accepts no responsibility for more than one incorrect insertion of any advertisement of any cost beyond the cost of the space occupied by the faulty advertisement. No re-publication will be given due to small typographical errors which do not lessen the effectiveness of the advertisement. Republikein does not accept responsibility for mispresentation in advertisements.

BOOK & PAY FOR YOUR CLASSIFIED ADS ONLINE

Visit https://classifieds.my.na - log in via your my.na account and follow the easy steps to upload your classified ad.

TODAY IS...

THESAURUS DAY

Thesaurus day will help you broaden your horizons and your vocabulary, and take joy in the beauty of language!

008 Betrekkings gevra Employment Wanted

ERIKA is op soek na huiswerk vir 2 dae per week. Het verwysings, is hardwerkend, netjies en betroubaar. Skakel 081-6642963.

DM0202200397321

009 Vakatures Vacancies

SWEISER/CUTTER: Soek Sweiser/Cutter met 5 jaar ondervinding. Moet onmiddellik diens kan aanvaar. Skakel asb. 061-249097

DM0202200397320

VACANCY: Retail Software Trainer wanted at Spitzkoppe Retail Solutions PTY LTD. You will be training users in the FMCG sector on various hardware, software, and VAS products. A training or teaching qualification is desired. Previous training experience essential. You will need a valid driver's license and your own vehicle. E-mail: recruits@archsoftware.co.za

DM0202200397360

GENERAL MANAGER POSITION: QUALIFICATIONS AND REQUIREMENTS: Higher education (Advantage). Proven experience in a managerial position (Advantage). Excellent written, verbal and interpersonal skills. Experience in the recycling or mining sector (Advantage). Experience working with government organizations (Advantage). Excellent organization and leadership skills and ability to motivate a team. Driving license. DUTIES AND RESPONSIBILITIES: Manage daily operations of the warehouse. Communicate and maintain relationships with existing and new potential clients. Review and improve organizational effectiveness by developing processes, overseeing employees, establishing a highly motivated work environment, and creating innovative approaches for improvement. Develop new business relationships. Responsible for warehouse machinery and workers. Maintain awareness of legislation and best practice. Please send us your CV to: namib.work@gmail.com

DM0202200397295

016 Te huur To Let

KHOMASDAL: Bachelor flat for single person. Near shops, UNAM Medical School and city. Available immediately, Prepaid electricity, N$3 800 plus deposit. Call 081-1272114

DM0202200397231

LUDWIGSDORF: Secure and modern two bedroom flat with a big kitchen, two bathrooms and a nice living/ dining room. Swimming pool, garden area and braai place included. Garage and electrical fence around the house. Rent N$12 000. Call 081-1265265.

DM0202200397322

027 Huise te koop gevra Residential Prop. to Buy

MLG PROPERTIES: Urgently looking for houses to sell and rent in all areas of Windhoek and in all ranges. Please call 081-2473803 Manfred to list your property now.

DM0202200397218

028 Huise te koop Residential Prop. for Sale

AFFLUX INVESTMENTS: Vacant erf for sale in Khomasdal. Erf no 5373, Hofsanger Street Khomasdal size 510 m². Selling price N$ 663 000. Call Afflux Investments 061-256419 / 081-2935293

DM0202200397310

028 Huise te koop Residential Prop. for Sale

AFFLUX INVESTMENTS: Swakopmund - Mondesa house Ext 4 Erf 2298 size 298 selling price N$1.238 875. Call Afflux Investments 061-256419 / 081-2935293

DM0202200397311

AFFLUX INVESTMENTS: Vacant Erf for sale in Okahandja Erf no. 305 Veddersdal 600m² N$280 000
Contact Afflux Investments 061-256419 / 081-2935293

DM0202200397312

035 Regskennisgewings Legal Notices

IN THE High Court of Namibia
Main Division
Case Number: HC-MD-CIV-ACT-CON-2020/02304
In the ex parte matter between:
BANK WINDHOEK LIMITED, Applicant and
JOHAN VAN STADEN, Respondent
AFFIDAVIT IN SUPPORT OF RULE 108(1) (b) APPLICATION
I, the undersigned, ANTON DE WIT, Do hereby make oath and say that:-
1. I am:-
1.1. an adult male, Head: Legal Collections of the applicant;
1.2. duly authorised to bring this application;
2. The facts contained herein fall within my personal knowledge and are true and correct.
3. The Applicant seeks an order as contemplated in Rule 108(1) (b) of the rules of this Court.
4. Pursuant to this court's order 26 November 2020 (attached and marked "A"), a Writ of Execution in regard to Movable Property was issued on 4 December 2020by the Registrar of the High Court. On the 10 May 2021 the Deputy Sheriff for the district of Okahandja attended to the Respondent's address and issued a Return of Non-service, because the Respondent had seemingly moved and could not be located. Copies of the Writ and Non-Service Returns of Service are attached hereto marked "B1-B2".
5. Applicant could thus not comply with Rule 108(1) (a) in that no Nulla Bona Returns of Service have been issued by the Deputy Sheriff in respect of the Respondent, and I refer to the annexures "B1-B2" in that regard.
6. The Applicant is advised, in any event that in property which is subject to a mortgage bond, it is unnecessary that an applicant must file a nulla bona return.
7. The Applicant was granted leave to serve the Rule 108 process (and any or all other necessary documents from this Court) to the Respondent by electronic mail at email address: vanstaden101@gmail.com and by publishing in a single publication in both the Republikein and Namibian Newspapers. The court order is attached and marked "C".
8. Applicant has a substantive right to execute against the immovable property hypothecated by virtue of the provisions of the bond executed in its favour.
9. Applicant therefore prays for an order as contemplated in Rule 108(1) (b) of the rules of this Court and as per the notice of motion filed herewith.
ANTON DE WIT
"I hereby declare that the deponent has sworn to and signed this statement in my presence at WINDHOEK the 4th day of NOVEMBER 2021 and he declared as follows: that the facts herein contained fall within her personal knowledge and that he understands the contents hereof; that she has no objection to taking the oath; that she regards the oath as binding on his conscience and has declared as follows: "I swear that the contents of this Sworn Affidavit are true and correct, so help me God."
COMMISSIONER OF OATHS

DM0202200397382

035 Regskennisgewings Legal Notices

IN THE High Court of Namibia
Main Division – Windhoek
Case No: HC-MD-CIV-ACT-CON-2020/01748
In the matter between:
NATIONAL HOUSING ENTERPRISE, Plaintiff and
HELGA NDAPANDULA KAIMBI, Defendant
NOTICE OF SALE IN EXECUTION FOR MOVABLE PROPERTY
In execution of a judgement against the above Defendant granted by the above Honourable Court on the 16th of July 2021, the following movable property will be sold by public auction on 5th February 2022 at 09H30 at the corner of No. 422 Independence Avenue Windhoek, Republic of Namibia:
1x brown lounge suite, 1x TV unit, 1x Canon printer, 1x KIC fridge,1x deep freezer, 2x black bar chairs, 1x black stove, 1x black bedroom headset,1x Logic fan, 1x mirror, 5x plastic chairs, 1x double bed with mattress, 1x ¾ bed with mattress, 1x black bedside table, 1x washing machine.
TERMS OF SALE: Voetstoots and cash to the highest bidder.
Dated at Windhoek on this day of December 2021.
DR WEDER KAUTA & HOVEKA INC.
PER: SARAPHINA PAULUS
Legal Practitioner for the Plaintiff
3rd FLOOR, WKH HOUSE
JAN JONKER ROAD,
AUSSPANNPLATZ
WINDHOEK
(Ref: MAT48616)

DM0202200397294

PUBLIC NOTICE FOR THE RENEWAL OF AN ENVIRONMENTAL CLEARANCE CERTIFICATE – Continued Operation of the Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands.
In accordance with the Environmental Management Act, 2007, (Act No. 7 of 2007) & the EIA Regulations 30 of 2012, industrial processing of dimension stones and disposal of solid sludge generated from the cutting and grinding of natural stone are listed activities which cannot be carried out without an Environmental Clearance Certificate (ECC) from the Department of Environmental Affairs & Forestry (DEAF). OMAVI Geotechnical & Geo-environmental Consultants has been appointed to undertake an Environmental Overview Study& prepare an updated Environmental Management Plan to support the renewal for ECC.
Proponent: Marmorwerke Karibib (Pty) Ltd
Site Locality: Both the natural stone processing facility and the abandoned borrow pit to be reclaimed and rehabilitated are located within the Karibib Townlands. A locality map is available on request from OMAVI.
In terms of the requirements of the EIA Regulations, all Interested & affected Parties (I&APs) must be provided with opportunities to participate in the Environmental Overview process. I&APs are therefore, hereby invited to register & submit written comments/ concerns/ suggestions by close of business on 12th February 2022. A Background Information Document is available to I&APs upon registration.
A public consultation meeting is tentatively scheduled for 29 January 2022; meeting Time and Venue shall be communicated with registered I&APs only.
Tel: +264 81 478 6303
(SMSes or WhatsApp Texts preferred for record keeping purpose)
Email: enviro@omavi.com.na

DM0202200397067

035 Regskennisgewings Legal Notices

IN THE High Court of Namibia
(Main Division)
Case Number: HC-MD-CIV-MOT-REV-2021/00422
In the matter between:
PAMO TRADING ENTERPRISES CC, Applicant
and
CENTRAL PROCUREMENT BOARD OF NAMIBIA, 1st Respondent
CHAIRPERSON OF THE CENTRAL PROCUREMENT BOARD OF NAMIBIA, 2nd Respondent
MINISTER OF FINANCE, 3rdRespondent
MINISTER OF EDUCATION, ARTS AND CULTURE, 4th Respondent
THE REVIEW PANEL, 5th Respondent
& 121 OTHERS 6th – 126th Respondent
TO:
(1) JAMES YOUNG TRADING ENTERPRISES CC; (2) BEVA INVESTMENTS CC; (3) SASH TRADING AND EARTHWORKS CC; (4)NDAKALIMWE INVESTMENTS CC; (5) TUTHIKAMENIPAMWE INVESTMENTS CC; (6) FUTUREFRESH SUPER MARKET CC; (7) OM'KWANA CATERER CC; (8) STREAM TWO PROPERTIES CC; (9) FUNDAMENTAL TRADING ENTERPRISES CC; (10) VERO GROUP CC; (11) ROCO FOOD INDUSTRIES CC; (12) OMAHEKE MEGASAVE (PTY) LTD; (13) INGONYAMA HOLDINGS (PTY) LTD; (14) CASSINGA CATERING GROUP; (15) AGILITY LOGISTICS GROUP CC; (16) OMALAETI FOODS (PTY) LTD; (17) CONFAB BISTROCC; (18) PUPKEWITZ CATERING SUPPLIES (PTY) LTD;(19) HOMEFIN PROPERTIES CC; (20) COUNTDOWN INVESTMENTS CC;(21) TRIOS MANGUE INVESTMENTS CC; (22) GDN INVESTMENTS CC; (23) INYANGUSHA TRADING ENTERPRISES CC; (24) IBA INVESTMENTS CC; (25) LUNGILE INVESTMENTS CC;(26) DITSA INVESTMENTS CC; (27) HBH CONSTRUCTION AND SERVICES CC;(28) KOMMANDO TRADING ENTERPRISE CC; (29) ACTION INVESTMENTS CC; (30) LUXURY INVESTMENTS FOUR ONE EIGHT (PTY) LTD; (31) TLM FOOD TRADING CC; (32) POTENZA INVESTMENT CC;(33) WINDHOEK PALM HOTEL CC; (34) OKG FOOD SERVICES (PTY) LTD; (35) M & H TRADING ENTERPRISES CC;(36) BELLA FOODRINKS SUPPLY CC; (37) INDY'S CATERING AND TRADING CC; (38) CLOUDS TRADING ENTERPRISES CC; (39) CHAKULA FOODS CC;(40) UNIFOODS CATERING SERVICES (PTY) LTD;(41) KUNENE CATERING SERVICES (PTY)LTD;(42)FLORIDA TRADING CC; (43) OMPADHI INVESTMENT CC;(44) GOLDWORKS INVESTMENT CC; (45) ASHY TRADING ENTERPRISES CC;(46) M.A.S INVESTMENTS CC;(47) MONDE CARLO GUESTHOUSE CC;(48) WIM PROPERTIES (PTY) LTD T/A PICK N PAYNAMIBIA; (49) FOUR CLOCKSE-COMMERCE CC T/A BUYONLINE NAMIBIA;(50) ST FREIGHTS TRANSPORT; (51) FLAMINGO IN-FLIGHT CATERING (PTY) LTD;(52) SEAL CATERERS (PTY) LTD;(53) MODERIEN-INVESTMENT CC;(54) CAMELOTINVESTMENT GROUP (PTY) LTD; (55)KAVITA LOGISTICS CC; (56) ELMONDO TRADING CC; (57) HIBACHIIN-VESTMENT HOLDINGS (PTY) LTD; (58) KITOKO HOLDINGS CC; (59)ANNA AND JUSTIN INVESTMENT CC; (60) ALTO'S INVESTMENT CC; (61) ELEPHANT REST TRAVEL AGENCY CC; (62) SIDA-KHOES TRADING CC; (63) EXCELLENT FARMING & FOOD (PTY) LTD; (64) DAKASA FOODS CC; (65) TULAINGFOODS SERVICES (PTY) LTD;

035 Regskennisgewings Legal Notices

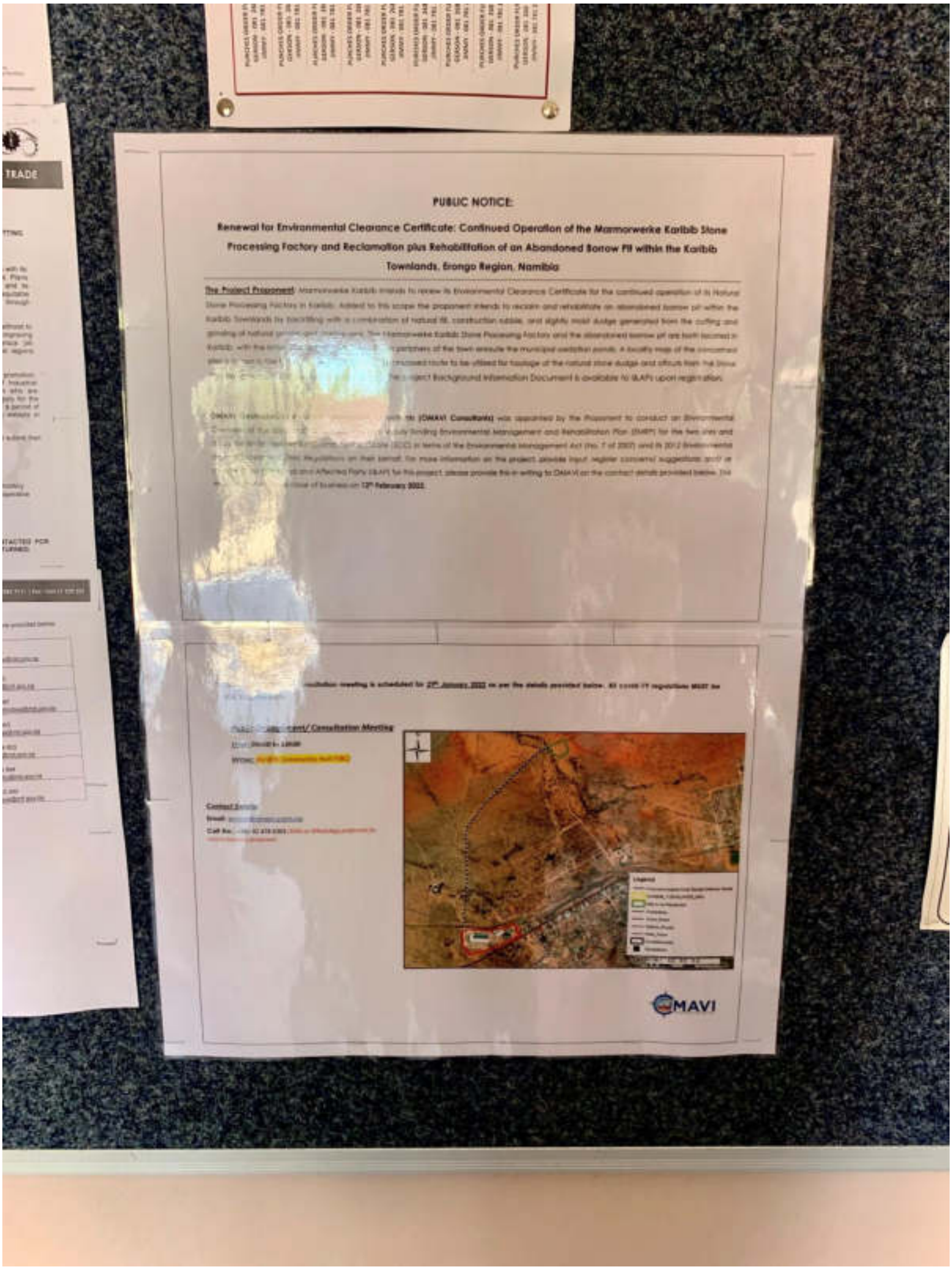
(66)EYAMBEKO NAMIBIA CATERING SERVICES (PTY) LTD; (67) REVENUE INVESTMENT CC; (68) NANGUEI TRADING CC; (69) OPUWO VATUE VAHIMBA INVESTMENT CC; (70) TJATU TRADING CC; (71) JACQUIE'S CLEANING AND CATERING CC; (72)KALANAMI ENTREPRENEURS AND MENTORSHIPINSTITUTE CC; (73) PASSIONSCULINARY AND HOSPITALITY INSTITUTE CC; (74) PLATINUM INVESTMENT CC;(75) DEGRANDE INVESTMENTS CC;(76) FLAME INVESTMENT CC; (77)FREE NAMIBIA CATERERS CC; (78) NAMIBIA GENERAL SUPPLIERS (PTY) LTD; (79) WALVIS BAY SHIP CHANDLERS (PTY) LTD ; (80) MUKAPA INVESTMENT CC; (81)NDAFI TRADING AND INVESTMENT CC; (82) KAZA FOOD SERVICES (PTY) LTD; (83) OTUZEMBA CATERING SERVICES (PTY) LTD; (84) KONGONGALO CATERERS CC; (85) DIE MAMAS KITCHEN CC; (86) DAGO ISLAND INVESTMENTS (PTY) LTD; (87) NAPANDUE INVESTMENTS CC; (88) OASES GENERAL DEALER CC; (89) UNDERA INVESTMENTS CC; (90) HOCHLAND FARMS CC; (91) EVALE HOLDINGS (PTY) LTD; (92) GONGALENI INVESTMENTS CC; (93) OMAUGUNGUCATERERS CC; (94) THOMAS NGHIVALWA EHAFO STORES CC; (95) ATLANTIC CATERING SOLUTIONS (PTY) LTD; (96) ETA INVESTMENTS CC; (97) ETN TECHNICAL SERVICES CC; (98) SUNSHINE FOODS SERVICES CC; (99) DEROUTE INVESTMENTS CC; (100) STS MEGA INVESTMENTS CC; (101) OPTIMUS NAMIBTRADING CC; (102) PENDA TRADINGAND CONSULTANCY CC; (103)EKWAKUTI TRADING CC; (104) KATIKITRADING ENTERPRISES CC; (105)KAMBWA TRADING CC; (106) IGLOOINVESTMENT CC; (107) NEW SUCCESSINVESTMENTS CC; (108) KENZIINVESTMENTS CC; (109) HOMESTEADACADEMY PRODUCTION-HUB CC; (110) SILVERSPOON TRADING CC; (111) PENAMANUFACTURERS CC; (112) BNMULTINATIONAL INVESTMENTS CC; (113) MAGNETIZE INVESTMENT CC; (114) WULIKA INVESTMENTS CC; (115) UPTOWN WINDHOEK INVESTMENTS (PTY) LTD; (116) PENDA ENTERPRISES CC; (117) TAFINA TRADING CC; (118) PISCES INVESTMENT HOLDINGS NO.32 CC; (119) CIRCLE HOSPITALITY SERVICES (PTY) LTD;(120) PATRIOT GENERAL SERVICES (PTY)LTD and (121) NAPUNIKWAINVESTMENT CC
FORM 3: Rule 13 (1) SUBSTITUTED SERVICE
TAKE NOTICE that by review application sued out of this court, you have been called on to give notice, within 10 days after the publication of this notice, to the Registrar and to the applicant's legal practitioner of your intention to oppose (if any) the review application wherein the applicant seeks an order in the following terms:
1. The 1st respondent's decision, purportedly taken on 7 October 2021, set out it in the Notice of Bid of Cancellation purportedly signed by
the 2nd respondent on 12 October 2021, to cancel the bidding process of Procurement Reference Number: G/ONB/CPBN-01/2020
(Procurement of Supply of Foodstuffs to Government School Hostels), is hereby reviewed and set aside.
2. The invitation for expression of interest under Procurement Reference Number: NCS/ONB/010-06/2021/22 (Expression of interest to be on Ministerial Database for Companies to Supply Foodstuffs to Government School Hostels), is hereby reviewed and set aside.
3. The 1st respo

KARIBIB OK SUPERMARKET


COMMUNITY
Care Corner
OK

KARIBIB CONSTITUENCY OFFICE


PARLIAMENT OF NAMIBIA


PUBLIC NOTICE:
Renewal for Environmental Clearance Certificate: Continued Operation of the Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands, Erongo Region, Namibia
OMAVI

MARMORWERKE KARIBIB FACILITY

PUBLIC NOTICE:

Renewal for Environmental Clearance Certificate: Continued Operation of the Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands, Erongo Region, Namibia

The Project Proponent: Marmorwerke Karibib intends to renew its Environmental Clearance Certificate for the continued operation of its Natural Stone Processing Factory in Karibib. Added to this scope the proponent intends to reclaim and rehabilitate an abandoned borrow pit within the Karibib Townlands via backfilling with a combination of natural fill, construction rubble, and slightly moist sludge generated from the cutting and grinding of natural granite and marble rock. The Marmorwerke Karibib Stone Processing Factory and the abandoned borrow pit are both located in Karibib, with the latter situated towards the northern periphery of the town enroute the municipal oxidation ponds. A locality map of the concerned sites is shown in the figure below together with the proposed route to be utilised for haulage of the natural stone sludge and offcuts from the Stone Processing Factory to the abandoned borrow pit. The project Background Information Document is available to I&APs upon registration.

OMAVI Geotechnical & Geo-Environmental Consultants (OMAVI Consultants) was appointed by the Proponent to conduct an Environmental Overview of the sites, draft and update a joint legally binding Environmental Management and Rehabilitation Plan (EMRP) for the two sites and apply for an Environmental Clearance Certificate (ECC) in terms of the Environmental Management Act (No. 7 of 2007) and its 2012 Environmental Impact Assessment (EIA) Regulations on their behalf. For more information on the project, provide input, register concerns/ suggestions, and/ or register as an Interested and Affected Party (I&AP) for this project, please provide this in writing to OMAVI on the contact details provided below. This must be done before close of business on **12th February 2022.**

The following public consultation meeting is scheduled for 27th January 2022 as per the details provided below. All covid-19 regulations MUST be strictly adhered to.

Public Engagement/ Consultation Meeting

Time: 09h00 to 13h00

Venue: Karibib Community Hall (TBC)

Contact Details:

Email: enviro@omavi.com.na

Cell No.: +264 81 479 4300 (SMS or WhatsApp preferred for record keeping purposes)

OMAVI

KARIBIB TOWN COUNCIL

PUBLIC NOTICE:

Renewal for Environmental Clearance Certificate: Continued Operation of the Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands, Erongo Region, Namibia

The Project Proponent: Marmorwerke Karibib intends to renew its Environmental Clearance Certificate for the continued operation of its Natural Stone Processing Factory in Karibib. Added to this scope the proponent intends to reclaim and rehabilitate an abandoned borrow pit within the Karibib Townlands by backfilling with a combination of natural fill, construction rubble, and slightly moist sludge generated from the cutting and grinding of natural granite and marble rock. The Marmorwerke Karibib Stone Processing Factory and the abandoned borrow pit are both located in Karibib, with the latter situated towards the northern periphery of the town enroute the municipal oxidation ponds. A locality map of the concerned sites is shown in the Figure below together with the proposed route to be utilized for haulage of the natural stone sludge and offcuts from the Stone Processing Factory to the abandoned borrow pit. The project Background Information Document is available to I&APs upon registration.

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The following public consultation meeting is scheduled for 29th January 2022 as per the details provided below. All covid-19 regulations MUST be strictly adhered to.

Public Engagement/ Consultation Meeting

Time: *09h00 to 13h00*

Venue: *Karibib Community Hall (TBC)*

Contact Details:

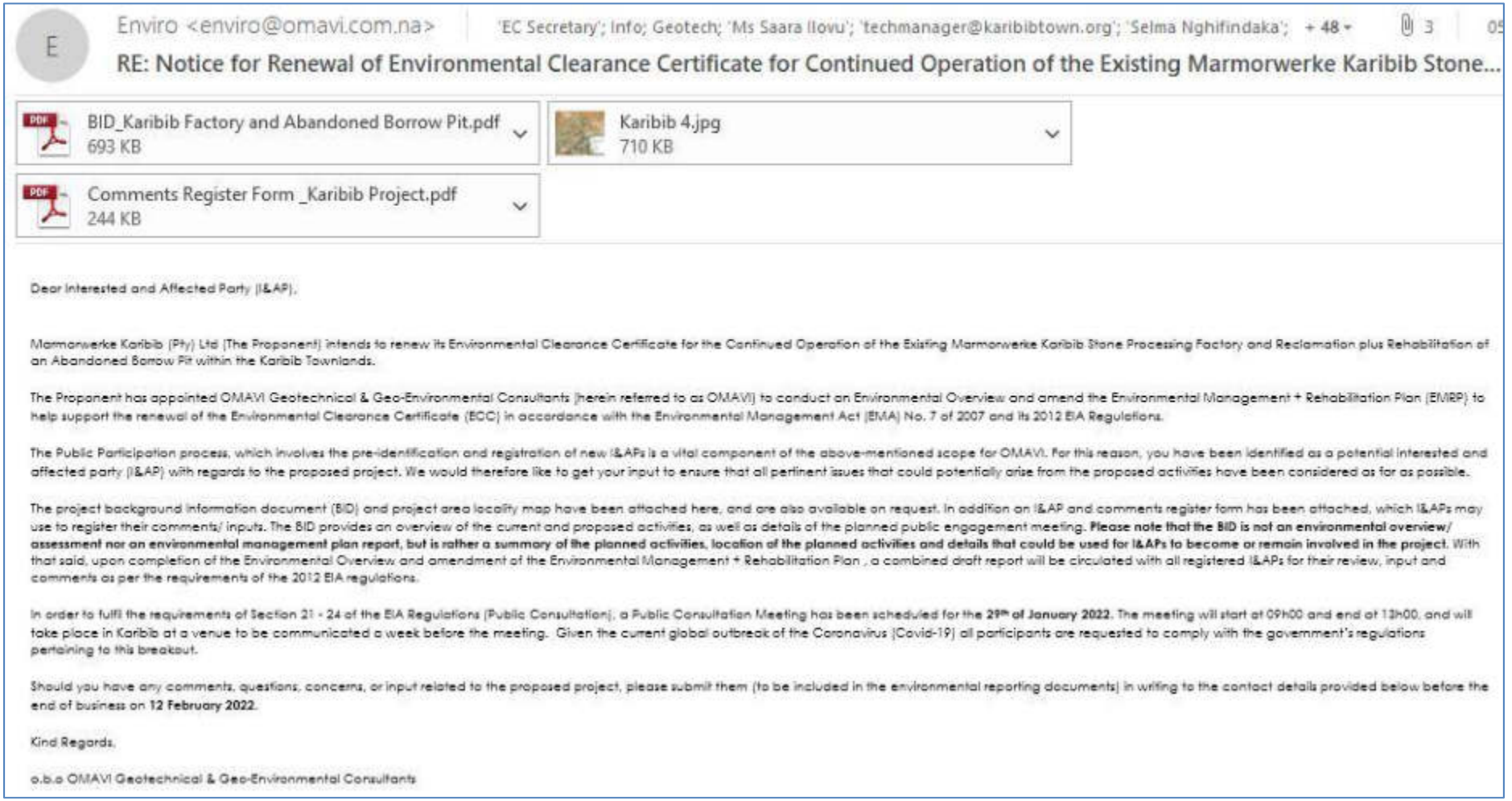
Email: enviro@omavi.com.na

Cell No.: +264 81 478 6303 *(SMS or WhatsApp preferred for record keeping purposes)*

OMAVI

APPENDIX G – CONSULTATION PROCESS PROOF and ORIGINAL FORMATS OF ISSUES, CONCERNS AND COMMENTS AS RECEIVED FROM THE I&APS

EMAIL COMMUNICATIONS TO AND FROM INTERESTED AND AFFECTED PARTIES



E

Enviro <enviro@omavi.com.na> 'EC Secretary'; Info; Geotech; 'Ms Saara Ilovu'; 'techmanager@karibibtown.org'; 'Selma Nghifindaka'; + 48 3 05

RE: Notice for Renewal of Environmental Clearance Certificate for Continued Operation of the Existing Marmorwerke Karibib Stone...

BID_Karibib Factory and Abandoned Borrow Pit.pdf
693 KB

Karibib 4.jpg
710 KB

Comments Register Form _Karibib Project.pdf
244 KB

Dear Interested and Affected Party (I&AP),

Marmorwerke Karibib (Pty) Ltd (The Proponent) intends to renew its Environmental Clearance Certificate for the Continued Operation of the Existing Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands.

The Proponent has appointed OMAVI Geotechnical & Geo-Environmental Consultants (herein referred to as OMAVI) to conduct an Environmental Overview and amend the Environmental Management + Rehabilitation Plan (EMRP) to help support the renewal of the Environmental Clearance Certificate (ECC) in accordance with the Environmental Management Act (EMA) No. 7 of 2007 and its 2012 EIA Regulations.

The Public Participation process, which involves the pre-identification and registration of new I&APs is a vital component of the above-mentioned scope for OMAVI. For this reason, you have been identified as a potential interested and affected party (I&AP) with regards to the proposed project. We would therefore like to get your input to ensure that all pertinent issues that could potentially arise from the proposed activities have been considered as far as possible.

The project background information document (BID) and project area locality map have been attached here, and are also available on request. In addition an I&AP and comments register form has been attached, which I&APs may use to register their comments/ inputs. The BID provides an overview of the current and proposed activities, as well as details of the planned public engagement meeting. **Please note that the BID is not an environmental overview/ assessment nor an environmental management plan report, but is rather a summary of the planned activities, location of the planned activities and details that could be used for I&APs to become or remain involved in the project.** With that said, upon completion of the Environmental Overview and amendment of the Environmental Management + Rehabilitation Plan , a combined draft report will be circulated with all registered I&APs for their review, input and comments as per the requirements of the 2012 EIA regulations.

In order to fulfil the requirements of Section 21 - 24 of the EIA Regulations (Public Consultation), a Public Consultation Meeting has been scheduled for the **29th of January 2022.** The meeting will start at 09h00 and end at 12h00, and will take place in Karibib at a venue to be communicated a week before the meeting. Given the current global outbreak of the Coronavirus (Covid-19) all participants are requested to comply with the government's regulations pertaining to this breakout.

Should you have any comments, questions, concerns, or input related to the proposed project, please submit them (to be included in the environmental reporting documents) in writing to the contact details provided below before the end of business on **12 February 2022.**

Kind Regards,

o.b.o OMAVI Geotechnical & Geo-Environmental Consultants

Pop Out ✕ Discard

Send

From ▾ enviro@omavi.com.na

To... Josephine Itengula <Josephine.Itengula@mawlr.gov.na>;

Cc... Info <info@omavi.com.na>

Subject RE: Notice for Renewal of Environmental Clearance Certificate for Continued Operation of the Existing Marmorwerke Karibib Stone Processing Factory and Reclamatio

Dear Mrs Itengula,

We thank you for the email. Please see our response in blue below

Kind Regards,
o.b.o OMAVI Geotechnical & Geo-Environmental Consultants

From: Josephine Itengula <Josephine.Itengula@mawlr.gov.na>
Sent: 17 January 2022 16:17
To: Enviro <enviro@omavi.com.na>; EC Secretary <EC.Secretary@meft.gov.na>
Cc: Info <info@omavi.com.na>
Subject: Re: Notice for Renewal of Environmental Clearance Certificate for Continued Operation of the Existing Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands

To: OMAVI Geotechnical & Geo-Environmental Consultants,

Thank you for your email and granted the documents provided. A few questions,

1. Will there be virtual platform during the meeting planned for the 29 January, 2021? If not, please consider adding this aspect. Unfortunately, provision has only been made for a face to face meeting. However, the minutes of the meeting will be shared with registered I&AP for further input, say within 7 days after the meeting
2. All those who register as I&APs for this project will be notified when the environmental overview and impact management/ rehabilitation plan report is completed and will receive the draft report for their review and **comments for a period of 7 days.** We would like to register as I&AP's i.e. The Department of Water Affairs at MAWLR. I have cc'd both my colleagues that will have interests in the matter as well. To officially register as an I&AP, kindly please complete the comments register and send back to us. Thank you for your interest in this project.

Thank you.

SA

Tue 25/01/2022 09:12

Siegfriedt Au-khaob <sheofficer@karibibtown.org>

RE: Notice for Renewal of Environmental Clearance Certificate for Continued Operation of the Existing Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townla

To Enviro

Cc Info; 'EC Secretary'; 'Lesly Goreseb (CEO)'; 'Ms Saara Ilovu'

Action Items

Good morning,

In regards to the Public Participation Meeting scheduled for 29th January 2022 in Karibib. Can you forward us the notice indicate the date, time and the venue.

Regards

Mr. Siegfriedt Au-Khaob

Environmental Health Practitioner

PUBLIC CONSULTATION MEETING HELD ON 29 JANUARY 2022

MAVI

Geotechnical & Geo-Environmental Consultants

PROJECT TILE AND LOCALITY:

RENEWAL OF AN ENVIRONMENTAL CLEARANCE CERTIFICATE – Continued Operation of the Existing Marmorwerke Karibib Stone Processing Factory and Reclamation plus Rehabilitation of an Abandoned Borrow Pit within the Karibib Townlands, Karibib Constituency, Erongo Region, Namibia

REGISTRATION AND COMMENTS FORM

I request to be registered as an interested and affected party in respect of the above proposed project.

NAME: Bianca	SURNAME: Foelscher
ORGANIZATION: Community	EMAIL:
DESIGNATION: Community Activist	Telephone: (064) 550109
Postal address and city: P.O. Box 67 Karibib	Namibia

Why is this project of interest to you?

As an engaged Namibian Community Activist, I strongly advocate for effective transparency and honesty from all the high profile mining investments in our beloved homecountry. Mining and Quarrying is of extracting nature and therefore an exploitive activity of our Namibian natural resources.
Enviromental Care and Responsibility, relevant socio-economic return for the Namibian people, labour and employment matters, as well as "What is the Namibian State/government getting in return" for such investments, is of highest concern to me (i.e. taxes, political favours, economic and social commitments, etc. are relevant for the nation to be aware of!!!)
Our dimensional stones are in high demand in China, and the rapid extraction of these resources are VERY VISIBLE, yet the betterment of the socio-economic development of our local people in Karibib remains an eye - Page 1 sore! (sewage overflow, dustpollution, overcrowding in homes etc.)
Something is just wrong, very wrong, with this picture!!!

(1)

B. F. 25/11/2022

MAVI

Geotechnical & Geo-Environmental Consultants

Do you have any factual special knowledge, data or information on the bio-physical and/ or socio-economic setting of the concerned sites that could assist in the current Environmental Overview/ Assessment process? If yes, please provide full reference(s), or the link to such reference(s), or indicate how and when you can share such data or information below.

?

Do you have any areas of concern or support regarding the proposed activities? If yes, please briefly list these in point form.

I am not an environmental expert, therefore I feel, this is the work of our "learned" professionals, to transfer an honest and fair message to the ordinary people. Our enviroment is our livelyhood, we deserve to know, whenever we are negatively affected!
We do not deserve, to be taken for granted or for fools, just because we cannot communicate, with the same enthusiasm about high profile mining industries, that still fail to improve our own daily lives!!!

(2)

B.K. 25/11/2022

MAVI
Geotechnical & Geo-Environmental Consultants

What are your foreseeable most practical and cost-effective impact mitigation or enhancement recommendations to minimize or maximize the issues you raised above?

Invite the public to regular! participation meetings, while sharing information in an honest and transparent manner. Keep the media informed, with open and honest information, for the Namibian people to know. Secrecy is soooo yesterday, because the future belongs to the young, and they deserve a better Tomorrow. ALWAYS!!!

Should the project proceed? If NO, please give factual and substantiated reasons below. If YES, please indicate in your view how positive impacts can be realistically optimized.

(3)

25/12/2022

? ? ?

DATE 25th January, 2022.	SIGNATURE B. [signature]
PLEASE COMPLETE THIS FORM AND RETURN TO:	enviro@omavi.com.na

(4)

B. [initials] 25/1/2022