

**UPDATED ENVIRONMENTAL MANAGEMENT PLAN FOR THE CONSTRUCTION
AND OPERATIONS OF TWO AGGREGATE QUARRIES AROUND NONIDAS
INDUSTRIA, ERONGO REGION , NAMIBIA**



Originally Assessed by:

Geo Pollution Technologies (Pty) Ltd

Assessed for:

Gecko Mining (Pty) Ltd

Updated: September 2023

Updated by: Lovisa Amwele & Oliver Krappmann

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Prepared for:	Gecko Mining (Pty) Ltd TEL.: (+264-61) 225826 P.O. Box 8912 Swakopmund Namibia
Main Project Team:	Quzette Bosman (BA. Geography/Sociology); (BA Environmental Management) André Faul (B.Sc. Zoology, Biochemistry); (B.Sc. (Hons) Zoology); (M.Sc. Conservation Ecology) Pierre Botha (B.Sc. Geology/Geography); (B.Sc. (Hons) Hydrology/Hydrogeology) Oliver Krappmann (MSc Geology, Geokey cc) Lovisa Amwele (Master's Environmental Management, Geokey cc, Gecko Exploration)
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I **Oliver Krappmann** acting as Gecko Mining (Pty) Ltd representative, hereby confirm that the project description contained in this report is a true reflection of the information which the provided to Geo Pollution Technologies (2017) and Gecko Mining (Pty) Ltd (2023) .

Signed at ___Windhoek___ on the _20th_ day of ___September___ 2023

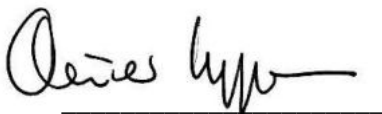


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1 BACKGROUND AND OBJECTIVES OF THE EMP

Gecko Mining (Pty) Ltd (hereafter referred to as Gecko), a subsidiary of Gecko Namibia, proposed the development of two aggregate quarries, one within the proposed Nonidas Industria Township situated on Portion 23 of Farm No 163, and the other located just north of Nonidas Industria. Additionally, the company further proposes the establishment of a brickfield which will use aggregate of both quarries on erf 13 of Nonidas Industria. Figure 1 provides the location of both quarries in relation to Nonidas Industria Township and the Erongo region. The above proposed require an Environmental Clearance Certificate (ECC) from the Ministry of Environmental Forestry Affairs and Tourism (MEFT). In support to an application for such an ECC, an Environmental Scoping Assessment (ESA) and Environmental Management Plan (EMP) has been conducted by Geo Pollution Technologies (Pty) Ltd in the year 2017. Mitigation measures as mentioned in the Scoping Report have been included in this related Environmental Management Plan (EMP) which was submitted with the Scoping Report to the Department of Environmental Affairs (DEA) of the MEFT.

An ECC was granted on the 24th of April 2018. This EMP is updated (September 2023) to affect the renewal of the ECC for the project. It is important to note that, no activities pertaining to the development of the quarries have been conducted yet, therefore majority of the aspects assessed in 2017 have not altered and hence measures as provided before are still valid.

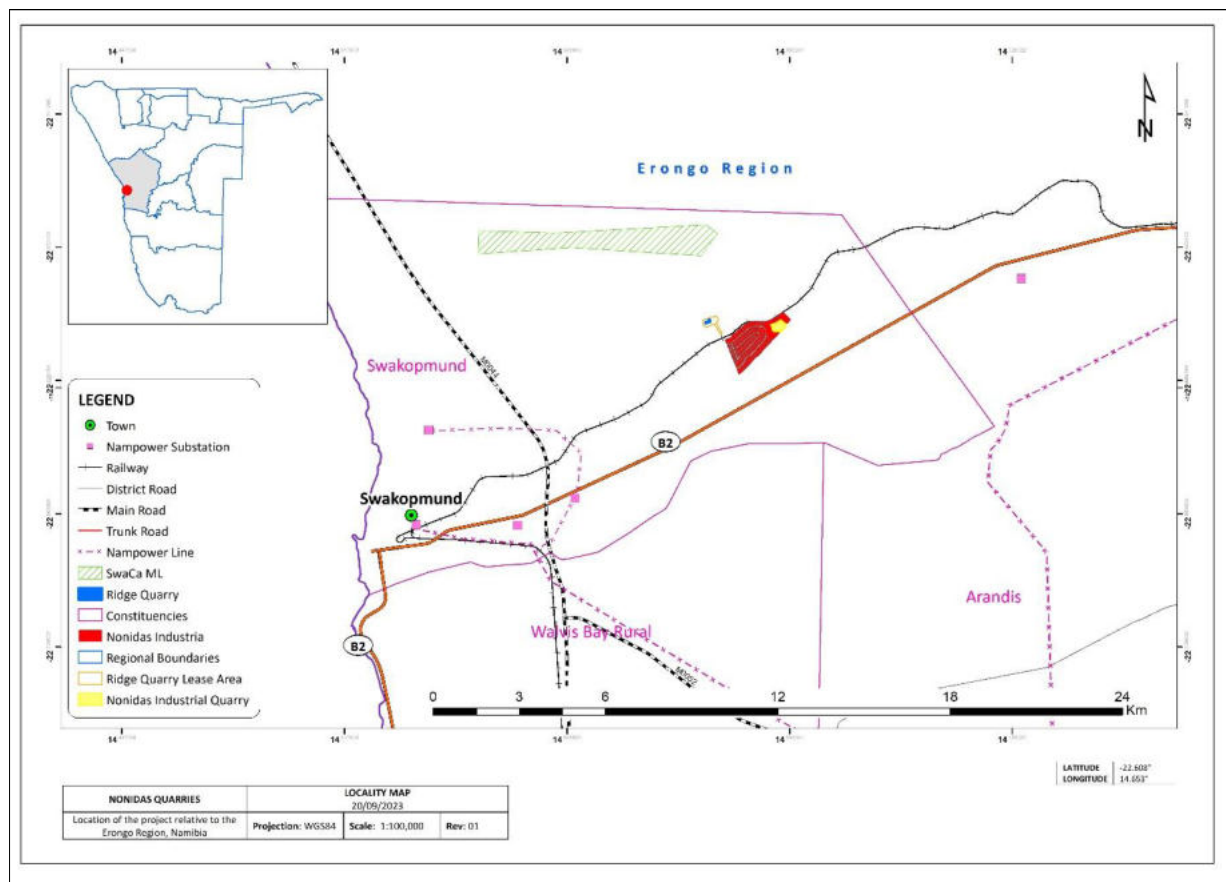


Figure 1 - Location of the quarries and Nonidas Industria

On 23 May 2019 the Municipal Council of Swakopmund approved the establishment of the Nonidas Industrial Township on Portion 23 of Farm no. 163 and has given consent to the layout of the planned development as submitted. Please find attached the notice and supporting letter from the Municipality of Swakopmund.

The (EMP) provides management options to ensure that impacts of construction and operations are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The EMP acts as a stand-alone document, which can be used during the various phases (planning, construction, operational and decommissioning) of any proposed activity or development. The construction phase includes the establishment of all infrastructure components required for the proposed operations (quarrying and brickfield).

All contractors and sub-contractors taking part in the construction and operations of proposed operations should be made aware of the contents of the EMP, so as to plan the relevant activities accordingly in an environmentally sound manner.

The objectives of the EMP are to:

- ◆ Include all components of the various activities;
- ◆ Prescribe the best practicable control methods to lessen the environmental impacts associated with the construction and operations of the proposed activities;
- ◆ Monitor and audit the performance of construction and operational personnel in applying such controls; and
- ◆ Ensure that appropriate environmental training is provided to responsible construction and operational personnel.

The proponent may choose to implement an Environmental Management System (EMS). At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- ◆ A stated environmental policy which sets the desired level of environmental performance;
- ◆ An environmental legal register;
- ◆ An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- ◆ Identification of environmental, safety and health training needs;

An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy; and

Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS.

2 THE EMP

The following general guidance for the EMP is based on the findings of the EA Scoping Report and risk assessment carried out by Geo Pollution Technologies with amendments where applicable in 2023 by Gecko Mining (Pty) Ltd. Reference to “site” refers to the following sites: Ridge Quarry, Nonidas Industria Quarry and Brickfield.

Land Use, Planning, Design, Operations – Identified Impacts

- ◆ **Noise Impacts:** Noise pollution will exist due to heavy vehicles accessing and operating on the site.
- ◆ **Blasting:** Blasting at the two quarries located in close proximity to one another, and to the proposed industrial development and a railway with associated siding, could potentially have an impact on existing and proposed infrastructure. Blasting and drilling to be conducted to affect only the immediate surroundings. Appropriately certified blasting contractors to be employed and blasting surveys to be undertaken for all existing infrastructure, prior to such activities being undertaken.
- ◆ **Dust and Air Quality:** Windy conditions are a common occurrence in the area. During site excavation activities of the operation phase, dust may become a nuisance and health risk to personnel and neighbours. Special care must be taken during periods of strong winds. The roads leading to the site are also unpaved and this may increase dust levels.
- ◆ **Socio-Economic Impacts:** Both construction and operations of the proposed operations will provide employment opportunities to residents of Swakopmund and Nonidas. The operational phase will make use of employees from the region in order to create permanent employment opportunities. The proposed project has further impact on the nearby residents’ expectations and aspirations for the future.

3 THE IMPLEMENTATION OF THE EMP

Tables 1 to 4 outline the management of the environmental elements that may be affected by the different activities, grouped in each phase of the development. These groups are as follows:

- ◆ Planning Phase
- ◆ Construction Phase
- ◆ Operational Phase
- ◆ Decommissioning Phase

Furthermore, all reporting as referred to in the tables 1 – 4 of this report, is suggested to be combined in an integrated **report and to be submitted to the DEA at MEFT on a bi-annual basis**. The report will not only serve as an indication on the compliance of the project promotor and project operator in line with this EMP but will also serve to report on all monitoring requirements and grievances received.

In addition to the reporting requirements as mentioned above, an additional report should be compiled and submitted to the DEA once the construction phase has been completed.

Table 1. Planning for Construction, Operations and Future Decommissioning of the Project

Activity	Objective	Action	Timing	Proof of Compliance	Responsible Body
Compliance	To comply with all legal requirements for the construction and operations of the project in Namibia.	Apply for the necessary permits from the various ministries, local authorities and any other bodies that governs the construction and operations of the proposed project.	Prior to Commencement of construction.	All contracts, permits, certificates and other legal documents on file.	Proponent
Capital Investment	Professionals from Namibia are to be used to ensure capital expenditure is within Namibia.	Gecko must employ Namibian professional companies where possible. Deviations from this should be justified.	All phases.	All contracts, permits, certificates and other legal documents on file.	Proponent
Appointments	To appoint reputable contractors and operational personnel and establish the EMP, a legal requirement that forms part of the contract with the contractor and employees.	Appoint a contractor and employees and enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractor, sub-contractors, employees and all personnel who will be present on sites.	Prior to commencement of construction and operations.	Contracts on file.	Proponent; Contractor

Management	Establish a management system to implement and monitor Health, Safety and Environment.	<ul style="list-style-type: none"> ◆ Make provisions to have a Health, Safety and Environmental Coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site. ◆ Have the following emergency plans, equipment and personnel in place to deal with all emergencies: ◆ Risk Management / Mitigation / Environmental Management Plan/ Emergency Response Plan and HSE Manuals ◆ Adequate protection and indemnity insurance cover for incidents; ◆ Comply with the provisions of all relevant safety standards; ◆ Procedures, equipment and materials 	Prior to Commencement of and during Construction and operations.	Documentation on file Personal Protection Equipment (PPE) on site. Signage related to restricted areas, dangerous areas, and PPE requirements on site. Emergency response material on site.	Proponent; Contractor
Activity	Objective	Action required for emergencies.	Timing	Proof of Compliance	Responsible Body
Restoration Fund/Insurance	To set aside funds for future environmental restoration or pollution remediation if required.	Set aside funds for future ecological restoration of the project site should project activities cease and the site be decommissioned (and environmental restoration or pollution remediation is required).	Prior to Commencement of and during Construction and operations.	Shareholders directive to the financial manager to budget for these eventualities.	Proponent

	of construction, operation and decommissioning as outlined in the EMP.	Certificate renewal applications where needed.	well as possible future decommissioning of the development.		
Grievance Mechanism and Information Sharing	To establish a grievance mechanism through which community members can voice their complaints as managed by a community liaison officer. Initiatives to communicate information about proposed future plans to the public and stakeholders. decommissioning as outlined in	<ul style="list-style-type: none"> ◆ Identify and appoint a community liaison officer ◆ Establish a grievance mechanism ◆ Gecko should continue with communication about future plans to the public and governmental agencies through the community liaison officer. needed. 	Continuous through all phases. future	Identify a community liaison officer. Complaints register and proof of communication kept on file.	Proponent
Environmental Clearance Renewal	To renew the Environmental Clearance Certificate every three years.	Appoint an environmental consultant to update the EMP and apply for renewal of the Environmental Clearance Certificate.	Prior to expiry of ECC.	Renewed Environmental Clearance Certificate.	Proponent; Independent Specialist Consultant

Construction activities will be conducted at three main areas of operation namely 1) The Ridge Quarry; 2) Nonidas Industry Quarry; and 3) Brickfield

Table 2. The Construction Phase

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Enhanced skills and Technology Transfer Promotion of Economic Development	People need skills to perform their jobs. The technology to do something is often not found locally. Development of people and technology are key to economic development.	Local Namibians must be employed. Deviations should be justified. <u>Skills Development</u> Where local skills do not exist, skills development should be promoted, and local labour involved to acquire new skills.	Proof of appointment of local contractors on file. Training records to be kept on file.	Proponent; Directors & Public Relations personnel.

<p>Increased Spread of HIV/AIDS; Increased Influx to Nonidas.</p> <p>Socials Ills and Pressure on Governmental Services</p>	<p>Increased employment opportunities will cause an influx of workers to the area. More people will increase social activities and interaction as well as increase pressure on existing governmental services.</p>	<p>Appointing reputable contractors who implement educational programs on HIV/AIDS for all staff. Employment reserved for local people only, should be practiced where possible. Deviations from this practice should be justified. Training of local people should be considered from the start. These measures will reduce the influx of newcomers to the town.</p>	<p>Proof of appointment of local contractors on file. Proof of HIV/AIDS training to be kept on file.</p>	<p>Proponent; Contractor</p>
<p>Employment</p>	<p>The construction as well as operational phases requires the employment of contractors as well as labourers.</p>	<p>Preference of employment to be provided to local and Namibian candidates. Where skills exist, local Namibian contractors must be employed. Deviations from this must be justified.</p>	<p>Proof of appointment of local contractors on file.</p>	<p>Proponent; Directors</p>
<p>Traffic</p>	<p>Construction activities are expected to have some impact on the movement of traffic when construction material and equipment are transported to all sites. Dust may be generated which can impair vision of road users. The objective would be to avoid incidents and accidents.</p>	<ul style="list-style-type: none"> ◆ Appropriate signage and warnings to be erected. ◆ Dust abatement measures to be implemented. ◆ All requirements of any traffic legislation to be adhered to. ◆ All loads are to be suitably covered. 	<p>Any complaints received regarding traffic issues should be recorded together with steps taken to mitigate the impacts.</p> <p>All information and reporting to be included in the final environmental report once construction finishes.</p>	<p>Contractor; Proponent</p>
<p>Fire</p>	<p>Construction activities near flammable materials may result in fires.</p>	<p>All equipment and tools must comply with standards which allow certain tools and equipment near flammable sources. Safety distances must be adhered to as well as safe work procedures. Safety talks and job hazard analysis to be done before work starts. Firefighting measures as per the Material Safety Data Sheets of the product should be adhered to.</p>	<p>Supervision of work is required and reports of safe and unsafe practice to be brought to the attention of the HSE department.</p> <p>Any incidents reported must be recorded together with steps taken to mitigate the impacts.</p> <p>Service records and provision of firefighting equipment kept on file. All information and reporting to be</p>	<p>Contractor; Proponent</p>

			included in the final environmental report once construction finishes.	
Health, Safety and Security	<p>During the construction phase, construction personnel will access the sites. Different excavation, earthmoving and transport equipment will be on site. This increases the possibility of injuries. A risk to site security and personnel health and safety exists during this period.</p>	<p>All Health and Safety standards specified in the Labour Act should be complied with. The responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site.</p> <p>The contractor should be obliged to adhere to the following:</p> <ul style="list-style-type: none"> ◆ Health and safety regulations pertaining to PPE, first aid kits, warning signs, etc.; ◆ Induction training for all who enter the site is required; ◆ Security personnel to prevent unauthorised entry of the all sites. ◆ Selected personnel should be trained in First Aid ◆ The contact details of all emergency services must be readily available. Access to all sites should always be strictly controlled/ ◆ Refer to an Emergency Response Plan (ERP), Material Safety Data Sheets and management system manuals. 	<p>A register of all incidents must be maintained. This should include measures taken to ensure that such incidents do not repeat itself.</p> <p>All information and reporting to be included in the final environmental report once construction finishes.</p>	Contractor; Proponent
Dust and Emissions	<p>aggravated during periods of strong winds which occurs regularly in Namibia and along the coast.</p> <p>Emissions relate mainly to the construction vehicles.</p>	<ul style="list-style-type: none"> ◆ Dust abatement measures to be implemented. ◆ Personnel are to be issued with appropriately rated and fitted dust masks. ◆ Excavations during strong north-easterly wind conditions should be avoided to prevent dust from being a nuisance (when dust suppression is not adequate). 	<p>Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</p>	Contractor; Proponent

		<ul style="list-style-type: none"> ◆ Dust generating activities (such as crushing) to be halted during extreme windy condition. ◆ Notices of blasting times to be erected and related hazard such as reduced visibility to be indicated. ◆ All vehicle and machines (including generators) are to be maintained to be in a properly working condition. 	All information and reporting to be included in the final environmental report.	
Noise	Noise created by heavy motor vehicles and machines accessing all sites with building materials, as well as the audible warning noises from trucks and heavy equipment. Compaction, cement mixing, drilling and excavating will be some additional noise producing activities.	<p>The World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment should be followed during the construction phase. This limits noise levels to an average of 70 dB over a 24 hour period with maximum noise levels not exceeding 110 dB during the period. It is recommended that a survey of the noise levels be carried out if complaints are received.</p> <ul style="list-style-type: none"> ◆ Construction workers to be issued with hearing protection where required. 	<p>A complaints register must be maintained in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</p> <p>All information and reporting to be included in the final environmental report.</p>	Contractor; Proponent
Light Pollution	Bright lights associated with the construction of the brickfield may be a nuisance to Nonidas residents.	<ul style="list-style-type: none"> ◆ All bright illumination directed downwards to prevent unsightly bright areas from small holding residents. 	Visual inspections to be conducted on light direction and functioning on an ongoing basis. Corrective measures to be documented.	Contractor; Proponent
Waste Production	The ability of products and building rubble to act as a waste which must be cleaned up or removed off-site. The environmental objective is to minimise waste creation and reduce risks of contamination.	<p>Due to the nature of some hazardous materials they should be disposed of in an appropriate way at an appropriately classified waste disposal facility. See the MSDS available from suppliers if the user is not sure how to dispose of the substance.</p> <p>Liaise with the Municipality regarding waste and</p> <ul style="list-style-type: none"> ◆ appropriate handling of hazardous waste. <p>Temporary waste disposal facilities should be</p>	<p>Regular visual inspection.</p> <p>A register of waste produced, and disposal methods should be maintained.</p> <p>All information and reporting to be included in the final environmental report.</p>	Contractor; Proponent

		<p>present on site. This should include separate containers for products that can be re-used or recycled.</p> <p>Removal of waste should be at regular (weekly) intervals to maintain visual orderliness, but more so to not give time for liquid waste to enter the soil substrate. Securely fasten or place all chemical toilets.</p>		
Groundwater, Surface Water Contamination	<p>Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table. Leakages from earthmoving, and construction vehicles, accidental spills of fuel, paints and other chemicals might occur. Groundwater might spread pollutants to neighbouring receptors.</p>	<p>All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem.</p> <p>Appointing qualified and reputable contractors is essential.</p> <p>The following measures must be employed to prevent spillage into surface water drainage channels and groundwater sources:-</p> <ul style="list-style-type: none"> ◆ Spill control structures and procedures must be in place according to SANS standards or better. ◆ All fueling should be conducted on surfaces provided for this purpose. E.g., Concrete slabs with regularly maintained seals between slabs. ◆ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, including the correct use of sumps and regular reporting of spillages must be audited and corrections made where necessary. ◆ Proper training of operators must be conducted on a regular basis. ◆ Any spillage of more than 200 l must be reported to the relevant authorities and remediation instituted. ◆ Spill clean-up means must be available on site 	<p>Report all spills during construction. All information and reporting to be included in the final environmental report.</p>	<p>Contractor; Proponent</p>

		<p>as per the relevant MSDS.</p> <ul style="list-style-type: none"> ◆ Ensure that all chemicals are properly stored in a specific location. All chemicals stored in this area must be properly labelled. The area where chemicals will be stored and handled must be constructed with an impermeable surface. ◆ Hazardous material must be transported and stored as per the relevant Material Safety Data Sheets. 		
Soil Contamination	Contamination with hazardous materials and / or chemicals used at all sites.	<p>The following measures must be employed to prevent spillage into surface water drainage channels and groundwater sources:-</p> <ul style="list-style-type: none"> ◆ Spill control structures and procedures must be in place according to SANS standards or better. ◆ All fueling should be conducted on surfaces provided for this purpose. E.g. concrete slabs with regularly maintained seals between slabs. ◆ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, including the correct use of sumps and regular reporting of spillages must be audited and corrections made where necessary. ◆ Proper training of operators must be conducted on a regular basis. ◆ Any spillage of more than 200l must be reported to the relevant authorities and remediation instituted. ◆ Spill clean-up means must be available on site as per the relevant MSDS. ◆ Ensure that all chemicals are properly stored in a specific location. All chemicals stored in this area must be properly labelled. The area where 	Report form for all spills or leaks during construction is to be completed by Contractor and submitted to the HSE department. All information and reporting to be included in the final environmental report.	Contractor; Proponent; Independent Specialist Consultant

		chemicals will be stored and handled must be constructed with an impermeable surface. Hazardous material must be transported and stored as per the relevant material safety data sheets (MSDS)		
Ecosystem Biodiversity And Habitat	Destruction and fragmentation of habitats due to site clearing. Bright lights may especially affect nocturnal bird species.	Construction footprint areas are to be limited to infrastructure. No movement of people or machines beyond the footprint area. All lights directed downwards to working surfaces and minimum lighting required, must be used at night.	Visual inspection of disturbed areas to be conducted weekly.	Proponent; Contractor
Heritage Impact	Sites with archaeologically or culturally important significance might be uncovered during excavations. These can include graves or cultural artefacts.	If such a site is found during the construction phase the construction process must be halted and the relevant authorities must be informed. Construction may only continue at that location once permission has been given from the related authority. The Namibian Police and the National Monuments Council dealing with heritage should be informed. Chance-find procedures should be adopted.	Record of any discoveries and proof of notifications to authorities on file. All information and reporting to be included in the final environmental report.	Contractor; Proponent
Landscape Character	The establishing of the mining sites may change the topography and land use thereby impacting the landscape character.	Limit the footprint area / disturbed area to the construction sites only. All the construction sites are to be kept neat and orderly.	Visual inspections conducted weekly and any misconduct to be documented.	Contractor; Proponent.
Cumulative Impact	Possible cumulative impacts associated with the construction phase include increase in traffic, dust generation, municipal planning, and loss of habitat and disturbance of natural migration patterns of birds. Additional cumulative	All other preventative measures for the different impacts will help reduce the significance of the impacts.	The final environmental report based on all other impacts must be created to give an overall assessment of the impact of the Construction Phase.	Contractor; Proponent

	impact are the influx hopeful jobseekers.			
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The operational phase management plan presents impacts and their associated mitigation measures for three operations: 1) Actual mining activities at the Ridge Quarry; 2) Actual mining at the Nonidas Industria Quarry; 3) Brick making. Some impacts and mitigation will be shared between all operations (indicated as general) while others will be activity specific.

Table 3. The Operational Phase

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Skills Transfer / Development and Promotion of Economic Development	<u>General</u> People need skills to perform their jobs. The technology to do something is often not found locally. Development of people and technology are key to economic development.	<u>General</u> Employ local Namibians. Any deviation should be well motivated. Training must be provided to Namibians to ultimately employ a predominantly Namibian workforce. All training provided must be certified and accredited either by institution or managerial reference.	<u>General</u> Bi-annual environmental report to provide a summary based on actual training and the enhancement of skills should be compiled.	Proponent; Directors & Public Relations personnel.
Increased Spread of HIV/AIDS; Increased Influx to Nonidas. Socials Ills and Pressure on Governmental Services	<u>General</u> Increased employment opportunities will cause an influx of workers and hopeful job seekers to the area. More people will increase social activities and interaction as well as increase pressure on existing governmental services. There will be health related risks and social ill which are expected with increased population numbers.	<u>General</u> Appointing reputable contractors who implement educational programs on HIV/AIDS for all staff. Employment reserved for local people, should be practiced where possible. Deviations from this practice should be justified. Training of local people should be considered from the onset of operations. These measures may reduce the influx of newcomers to the town.	<u>General</u> Bi-annual environmental report to provide a summary based on educational programmes and training conducted. Bi-annual environmental report to provide a review of employee demographics.	Proponent; Directors & Public Relations Personnel.
Employment	<u>General</u> Mining, transportation and processing will create permanent employment opportunities.	<u>General</u> Where skills exist locally Namibians must be employed. Any deviation should be motivated. Alternatively, training must be provided to Namibians to ultimately employ a predominantly Namibian	<u>General</u> Bi-annual environmental report to provide a summary based on employee records.	Proponent; Directors

		workforce.		
Contribution to Local and Regional Economy	<u>General</u> Revenue generated and employment paid will add to the local and regional economy.	<u>General</u> Namibian contractors to be used. All processing (crushing) and manufacturing (brickmaking) to be conducted within Namibia.	<u>General</u> Bi-annual environmental report to provide a summary based on employee records.	Proponent; Directors
Traffic	<u>General</u> Increased heavy motor vehicle traffic may increase the risk of traffic incidents and road degradation. Heavy loads constantly crossing the railway line degrades the crossing and pose a greater incidents risk.	<u>General</u> Adequate traffic signs to direct trucks and other vehicles to minimize impacts on traffic between the quarry sites and the brickmaking plant. Maintain road infrastructure, signs and intersections. Appropriate signage and actual crossing to be implemented and maintained at the railway by Gecko. Crossing to be maintained according to TransNamib specifications.	<u>General</u> Any complaints received regarding traffic issues should be recorded in the Bi-annual environmental report.	Proponent; Contractor; TransNamib & Roads Authority
Security	<u>General</u> Unauthorized entry leading to theft of equipment and/or product and/or fire hazard, security hazard.	<u>General</u> Security procedures and proper security measures must be in place. Strict security that prevents unauthorised entry to operational areas. Fitness for work certificates for every security officer to be issued on a monthly basis. Daily alcohol testing should be carried out by an authorised person at the start of each shift.	<u>General</u> Bi-annual environmental report to provide a summary of all incidents reported. Perimeter safety barrier to be maintained.	Proponent; Security Supervisor.
Fire and Explosion Hazard	<u>General</u> Storage and use of flammable substances may pose a risk of an explosion and / or fire.	<u>Quarry Sites</u> The following controls are typical measures for mitigating the threat of incorrect use of explosives and possible fire outbreak:- <ul style="list-style-type: none">◆ Train personnel regarding the use of explosives,◆ All conditions to be adhered to as prescribed by the	<u>General</u> Bi-annual environmental report to provide a summary of all incidents reported. The Bi-annual environmental report	Proponent

		<p>Chief Inspector regarding the storage and use of explosives.</p> <p><u>General</u> The following controls are typical measures for mitigating the threat of spillage of hazardous chemicals and possible fire outbreak:-</p> <ul style="list-style-type: none"> ◆ Storage according to Material Safety Data Sheet and SANS instructions ◆ Site inspection and maintenance ◆ Operational procedures and training ◆ Mechanical and electrical inspections ◆ Fire extinguishers ◆ Trained personnel good housekeeping ◆ Reporting of leaks/spills <p>Fire Fighting and Fire Prevention:</p> <p>All fire precautions and fire control at all sites must be in accordance with relevant SANS regulations or better. Firefighting measures as per the Material Safety Data Sheets of the products should be adhered to.</p> <p>A holistic fire protection and prevention plan is needed for each operational area. This plan must include an emergency response plan and firefighting plan.</p>	<p>should contain dates when fire drills were conducted and when fire equipment was tested.</p> <p>Explosives storage approval kept on file and on site with requires additional documentation.</p>	
Health & Safety	<p>Mining and crushing procedures present risks to human beings. These risks are assessed in terms of the predicted impact if realised. Typical examples are:-</p> <p>General</p> <ul style="list-style-type: none"> ◆ Staff not wearing PPE 	<p><u>General</u> Typical mitigating measures within the health and safety management systems are:-</p> <ul style="list-style-type: none"> ◆ Compliance with health and safety standards specified in the Labour Act ◆ Operational and procedural manuals 	<p><u>General</u> Inventory of necessary information and administrative documentation to be kept on a weekly basis</p> <p>Bi-annual environmental</p>	Proponent

	<ul style="list-style-type: none"> ◆ Incorrect handling of chemical and equipment <p>Quarry Sites</p> <ul style="list-style-type: none"> ◆ Blasting related incidents ◆ Uncontrolled heavy motor vehicle movement ◆ Incidents related to product movement and or transportation. 	<ul style="list-style-type: none"> ◆ Health and safety training ◆ Housekeeping rules ◆ Colour coding areas, pipes, equipment and substances ◆ Signage for PPE (e.g. protective clothing like safetyboots and hard hats) ◆ Safe work procedures and permits to work ◆ Clearance certificates for confined spaces ◆ Emergency response plans ◆ Material Safety Data Sheets (MSDS) ◆ First aid treatment and training ◆ Medical procedures and emergency services ◆ Daily safety moments and/or drills 	<p>report to provide a summary of all incidents reported. The Bi-annual environmental report should contain dates when training was conducted and when safety equipment and structures were inspected and maintained.</p>	
Noise	<p><u>Quarry Sites</u></p> <p>Noise will exist due to operation of heavy motor vehicle and machines aswell as by the crushing material.</p>	<p><u>General</u></p> <p>Brickmaking will be conducted in an industrial area so thereis no restriction on the times of operation. The World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment for workers at all sites must be followed. This limits noise levels to an average of 70 dB over a 24 hour period with maximum noise levels not exceeding 110 dB during the period.</p>	<p><u>General</u></p> <p>Any complaints received regarding excessive noise should be recorded and all complaints to be compiled inaBi-annual environmental report.</p>	Proponent

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Landscape Character	<p><u>Quarry Sites</u> Changing of the localised topography and land use will result in a change in landscape character as aggregate is removed from both sites.</p>	<p><u>Quarry Sites</u> Limit the footprint area / disturbed area to the operational sites only. Continuous rehabilitation and shaping of mined- out areas. All operational areas are to be kept neat and orderly.</p>	<p><u>Quarry Sites</u> Visual inspection of the sites to be conducted weekly and any deviations from the requirement to be documented and included in the Bi-annual environmental report.</p>	Proponent; Contractor
Waste Production	<p><u>General</u> The ability of a product to act as a waste which must be cleaned up. Domestic waste from bins, offices and ablution facilities (inclusive of any polluted material such as soil).</p> <p><u>Brickmaking Operations</u> During brick making, cement will be used and continually wetted. Empty cement bags may be a hazardous waste.</p>	<p><u>General</u> See the Material Safety Data Sheet for handling hazardous substances. All domestic waste should be disposed of timeously to maintain visual orderliness, but more so to not give time for liquid waste to enter the soil substrate. Contaminated soils can be remediated in accordance with accepted procedures at a site dedicated for this purpose.</p> <p><u>Brickmaking Operations</u> Liaise with the municipality regarding waste and handling of hazardous and potential harmful materials such as cement bags.</p>	<p><u>General</u> A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility. Any complaints received regarding waste should be recorded with notes on action taken. All data to be compiled in a report and a summary included in the Bi-annual environmental report.</p>	Proponent

<p>Groundwater, Surface Water and Soil Contamination</p>	<p><u>General</u> Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table.</p> <p>Groundwater is not utilized in the area for human consumption but should still be protected at all costs.</p> <p><u>Quarry Sites</u> Spilled chemicals, hydrocarbons leaking from vehicles, hydraulic fluids from broken earthmoving equipment can all potentially result in pollution during mining and transporting activities.</p> <p><u>Brickmaking Operations</u> Wetted cement laden runoff may penetrate the soil.</p>	<ul style="list-style-type: none"> - Spill clean-up means must be available on site as per the relevant Material Safety Data Sheet. - Removal and remediation of any polluted soil or groundwater. - Regular inspection and servicing of all vehicles travelling between the quarry sites and brickfield. <p><u>Brickmaking Operations</u> All phases of brickmaking to be conducted on impermeable surfaces with related stormwater measures to contain any runoff during normal working operations and / or rainfall events.</p>	<p><u>Quarry Sites</u> Bi-annual water samples must be taken from monitoring holes and analysed for any hydrocarbon pollutants present.</p> <p>An bi-annual environmental report for MEFT should be compiled relating any spills or leakages reported.</p>	<p>Proponent</p>
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<p>Soil Conservation</p>	<p><u>Quarry Sites</u> Continuous mining loosens soil and creates topographical features that induce erosion.</p>	<p><u>Quarry Sites</u> Proper erosion control measures must be installed and a surface runoff management plan compiled by registered Namibian engineering consultant. Continuous shaping of mined-out areas.</p>	<p><u>Quarry Sites</u> Maintenance of storm water structures to be ongoing a visual inspection to be conducted monthly. Any deviations to the requirement to be documented and included in the bi-annual environmental report.</p>	<p>Proponent; Contractor</p>
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<p>Visual Impact</p>	<p><u>Quarry Sites</u> Continuous mining and transportation of the raw material will change the land use and character of the area. Blasting activities, crushing and transportation of raw material may create dust plumes.</p>	<p><u>Quarry Sites</u> Dust suppression initiatives are to continue at the quarry sites. Operational footprint areas are to be limited to infrastructure. No movement of people or machines beyond the footprint area / haul road. All lights directed downwards to working surfaces and minimum lighting required. Continuous shaping and rehabilitation of the mined out areas to be conducted.</p>	<p><u>Quarry Sites</u> Bi-annual environmental report to provide a summary of all complaints reported. Records should be kept of all maintenance conducted on the project infrastructure.</p>	<p>Proponent</p>
<p>Ecosystems Biodiversity</p>	<p><u>Quarry Sites</u> Destruction and fragmentation of habitats mainly as a result of ongoing mining which will continually transform habitat areas.</p>	<p><u>Quarry Sites</u> All staff to be sensitised regarding environmental concerns regarding poaching, conservation and the value of resource preservation.</p>	<p><u>Quarry Sites</u> Inspections on habitat destruction to be conducted by an external specialist consultant every 6 months. Findings of the monitoring to be included in the bi-annual environmental report.</p>	<p>Proponent</p>
<p>Dust and Air Quality</p>	<p><u>Quarry Sites</u> Blasting, the removal, transportation and processing of material will create dust.</p>	<p>General Dust abatement measures to be employed at all crusher sites and the haul road.</p>	<p>General A dust monitoring plan should be designed and implemented so as to determine baseline conditions and compare these to construction and operational sources of dust. The effectiveness of the abatement measures can be determined. Monthly dust fallout</p>	<p>Proponent</p>

			results can be interpreted and the conclusions included in the bi-annual environmental report.	
Cumulative Impact	Possible cumulative impacts associated with the operational phase include increase traffic incidents, landscape character, dust as well as habitat fragmentation and loss.	Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact. Reviewing Bi-annual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient.	The bi-annual environmental report should summarize all other impacts. This will give an overall assessment of the compliance to the Operational Environmental Management System.	Proponent

Table 4. Decommissioning Phase

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Waste Production	<p>Upon decommissioning waste will be produced in the form of building rubble, obsolete equipment and structures, obsolete or residual products and equipment or structures that can be used elsewhere or sold as scrap.</p> <p>Remaining chemicals with no further purpose or use or obsolete chemicals are a waste product.</p> <p>Soil polluted by hydrocarbons or chemicals must be treated as hazardous waste.</p>	<p>To reduce the amount of waste all re-usable infrastructure not needed for the future plans of the land must be removed to another site owned by Gecko, or sold.</p> <p>Those items that cannot be used again must be scrapped in the appropriate manner.</p> <p>Upon demolition of the rubble must be removed from the property and taken to an approved dumpsite designated by the local municipality.</p> <p>Chemical or hazardous waste must be disposed of according to MSDS instructions and at an appropriately classified disposal facility.</p> <p>Rehabilitation if necessary is to be done using funds designated for the purpose.</p>	<p>Regular visual inspection.</p> <p>A register of waste produced and disposal methods should be maintained.</p>	<p>Proponent; Contractor</p>
Ecological Impact	<p>Operations spanning many years may create new habitat for fauna and flora. Upon decommissioning these habitats will be destroyed.</p>	<p>Ensure that no new habitat is created for flora and fauna. Before decommissioning the HSE would need to inspect every structural facility to ensure that the dismantling and removal of any structure would not affect any organism that has become dependent on those structures for survival, shelter or breeding.</p> <p>Where new habitats were created, that is now occupied by fauna or flora, Gecko must contact MEFT or other appropriate organizations to establish the conservation status of them.</p> <p>The possibility of relocating the fauna or flora must be investigated and executed. Should the species be listed as vulnerable to extinction, or worse, a meeting should be held with MEFT in order to determine the appropriate handling of the situation.</p>	<p>A final environmental report will provide a summary of any fauna and flora that established itself on the premises. The final environmental report should include all actions taken to relocate or deal with the situation.</p>	<p>Proponent; Contractor</p>

Employment	Decommissioning may lead to retrenchments or re-location of staff no longer required.	Plan in advance for meeting the Labour Acts requirements for retrenching of staff if required. Where possible staff can be relocated to another facility or town where business continues in the same way.	The final environmental report that must be compiled should include the appropriate plans for handling of employees should the facility be decommissioned. This report should include budgeting for retrenchments and possible alternative positions elsewhere.	Proponent; Directors & Public Relations personnel or Human Resource Department.
Dust	Dust will be generated during the decommissioning phase and might be aggravated during periods of strong winds.	It is recommended that regular dust suppression be included in the decommissioning phase, when dust becomes an issue. Personnel should be issued with appropriately fitted and rated dust masks for health and safety reasons.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	Proponent; Contractor
Noise	Noise will exist due to equipment and heavy vehicles accessing all sites for demolition purposes or collection of rubble from demolished buildings.	World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment should be followed. This limits noise levels in industrial areas to an average of 70 dB over a 24 hour period with maximum noise levels not exceeding 110 dB during the period. All personnel must be issued with hearing protectors and neighbours must be notified of the time and duration of decommissioning. Notice of the decommissioning should be given to the local authorities prior to commencing with invitation to	A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	Proponent; Public Relations Personnel; Contractor.

		give feedback at any time with regards the noise impact.		
Groundwater, Surface Water and Soil Contamination	Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table.	All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem. Leakages from vehicles, earth moving equipment and machines might occur. Pollutants in the soil and building rubble must be transported away from the site to an approved, appropriately classified waste disposal site. Confirm Material Safety Data Sheet information for any remaining chemical products that must be discarded.	A site closure baseline report for all spills or (dust) leaks is to be completed by Contractor and submitted to the Gecko. A baseline study must be carried out after decommissioning. This is to assess the condition of soil substrate and any groundwater present. Comparisons with pre-construction baseline data is to be made and any discrepancies must be addressed before the site can be signed over.	Proponent; Contractor
Health, Safety and Security	During the Decommissioning Phase similar risks to human beings as with previous phases will be present. This include physical injury or exposure to chemicals or other harmful products.	<ul style="list-style-type: none"> ◆ Compliance with health and safety standards specified in the Labour Act ◆ Proper training of operators; ◆ First aid treatment; ◆ Medical assistance; ◆ Emergency treatment; ◆ Protective clothing, footwear, gloves and belts; safety goggles and shields; ◆ Manuals and training regarding the correct handling of materials and packages should be in place and updated as new or updated Material 	A register of all incidents must be maintained on basis. This should include measures taken to ensure that such incidents do not repeat itself.	Proponent; Contractor

		<p>Safety Data Sheets' become available;</p> <ul style="list-style-type: none"> ● 24-hour security surveillance in case of opportunistic activities. 		
<p>Fire and Explosion Hazard</p>	<p>Residual flammable materials (chemicals) could be present and might pose a risk to the teams dismantling the various structures or buildings, especially the chemical store.</p>	<p>Gecko has to adhere to all occupational health and safety requirements; all personnel have to be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials including rubbish and dry vegetation. Regular inspections should still be carried out to inspect and test firefighting equipment and pollution control materials. Holistic fire protection and prevention plans should still be utilised.</p>	<p>A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat itself.</p>	<p>Proponent; Contractor</p>

4 CONCLUSIONS

The above Environmental Management Plan, if properly implemented will help minimise adverse impacts on the environment. Where impacts occur, immediate action must be taken to reduce the escalation of effects associated with these impacts. To ensure the relevance of this document to the specific stage of project, it needs to be reviewed throughout all phases.

The Environmental Management Plan should be used as an on-site reference document during all phases of the proposed project, and auditing should take place in order to determine compliance with the EMP for the proposed site, and Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

Monitoring reports must be kept available for possible submission with future renewal applications for environmental clearance certificates. Geokey Consult cc is contracted for attending to environmental safety and health matters pertaining to this project.