Report
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PROJECT STATUS

Title	Environmental Management Plan for the exploration activities for Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals, within the EPL 8474 covering a total area of 19 790.9456 Hectares in the Kunene Region, Namibia.		
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ABBREVIATIONS

AIDS	Acquired Immuno-Deficiency Syndrome
ESA	Environmental & Social Assessment
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
HIV	Human Immuno-deficiency Virus
HEEC	Healthy Earth Environmental Consultants CC
I&APs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Water & Land Reform
MEFT: DEA	Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs
MHSS	Ministry of Health & Social Services
NHCN	National Heritage Council of Namibia
PR	Proponent's Representative
Reg.	Regulation
S	Section
TB	Tuberculosis

1. INTRODUCTION

Mining contributes to 25% of the country's income. It is the largest contributor to the Namibian economy. Namibia has various natural resources including diamonds, uranium, copper, gold, lead, tin, lithium, cadmium, zinc, salt and vanadium. Copper is by far the most abundant mineral commodity in Namibia. This is reflected not only by the fact that several copper mines are productive in the country at present: archaeological evidence in the form of ancient smelting sites proves the Namibian copper deposits have been exploited for many centuries. Radiocarbon dates suggest that copper was smelted in the Khomas Hochland as early as 1420, while pre-modern mining and metallurgical activities peaked during the seventeenth century (Kinahan and Vogel, 1982).

The proponent, Blue Spade Construction CC intends to explore **Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals** from the EPL 8474, situated at Otwani, Opuwo Rural Constituency, Kunene Region, Namibia. The Ministry of Trade and Industry regulates manufacturing, including mineral beneficiation, cement production, and semiprecious stone processing. Nationwide exploration now focuses on lithium, tin, diamond, gold, natural gas and uranium. This shows that the mining sector has great potential to grow and continue to development in the country.

The Government of Namibia recognises that the exploration and development of its mineral wealth could best be undertaken by the private sector. Government therefore focuses on creating an enabling environment through appropriate competitive policy and regulatory frameworks for the promotion of private sector investment coupled with the provision of national geo-scientific data bases essential for attracting competitive exploration and mining (Minerals Policy of Namibia, MME, 2013).

It is with this background that **Blue Spade Construction CC** has decided to explore for Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals for commercial purposes and derive the monetary benefits associated with the extraction of these natural resources as he is a holder of the application for the EPL 8474 from the Ministry of Mines and Energy after following all the necessary procedures to satisfy the relevant Authorities enabling them to explore the natural mineral resources from the allocated portion on the EPL 8474.

The EMP will be a living document, developed in consultation with the proponent, to be reviewed and updated biannually. More broadly, it will provide a blueprint for handling environmental issues related to exploration activities at the EPL 8474, situated at Otwani, Opuwo Rural Constituency, Kunene Region of

Namibia over the next 5-10 years to find viable deposits, within the broader context of environmental and social sustainability.

1.1 Benefits and target population

Managing and mitigating environmental problems in the mining sector would yield economic benefits from improved human health and ecosystem functions in the Otwani Village area where the EPL 8474 is situated. Health benefits will accrue from reduced exposure to environmental pollution and to the risk of accidents. The Project would also indirectly help improve worker health and safety conditions in existing and future mining enterprises, by strengthening the regulatory framework.

The proposed project will indirectly benefit the people of Namibia by removing impediments to new private investments and job creation as it will employ over 30 people on a permanent basis on the active exploration site. The exploration operations will provide improved capacity to the mandated national agencies to regulate mining & exploration activities through environmental monitoring and auditing. In turn this will enhance the management and planning capacities of Blue Spade Construction CC, and of delegated authorizing agencies such as MEFT, and improve the skills of staff from these agencies to do strategic planning, monitoring, and to evaluate environmental issues in this specific area and develop/propose mitigation measures. The Project will help strengthen national capacity in environmental management through consultancies, studies, and targeted training.

1.2 The main environmental issues related to exploration at the EPL 8474 are:

a) **Air Pollution**

The major environmental issue on the EPL 8474 is air pollution. Dust can severely affect the health of neighboring populations (especially respiratory problems) in Otwani village and adjacent farms.

b) **Soil Contamination**

Leaking hydrocarbons such as oil/diesel/ petrol during exploration operations/activities can contaminate soil.

c) Water pollution

Several ephemeral rivers are found within the Otwani Village and the EPL 8474 area. This makes the area susceptible to flooding in some areas during the rainy season. Runoff and leakage from existing waste rock dumps from the mining claims within the EPL 8474 may pollute streams flowing out of the area, causing widespread negative impacts downstream from the mines that extend as far as the Kunene River and affect wetlands and tributaries. The pollution has an impact on human health and ecological functions that is not fully determined. Lower water quality leads to increased water treatment costs. The pollution from the waste rock dumps needs to be contained and the sites rehabilitated. There are currently no visible surface water bodies to be considered with regard to the active exploration sites, as there are no perennial water sources in the area. However, surface water impacts may be encountered during the operation phase, especially if excavation takes place within the rainy season.

The risk of contaminating such water sources can be increased by accidental spillage of oils and fuels and any other equipment used during operation. This risk is minimised by the fact that the extraction phase will be within the long dry season.

The main foreseen environmental problems at the EPL 8474 are deforestation, soil contamination, pollution, land dereliction, poor modern sanitation, unplanned makeshift homes around the EPL 8474 site and noxious weeds arising from eutrophication of any nearby water bodies by sewage effluent. The impact of pollution from exploration activities is compounded by the fact that nearly ninety per cent of the populations in Otwani Village are nomadic pastoralists. This has resulted in concentrated demand for natural resources, such as grazing land, water, energy, and food. Competing demands for water by livestock and households is already constraining the sustainable use of water resources. Blue Spade Construction CC have identified this issue and have plans to assist the already operating mines to allieviate the water scarcity in the Otwani village by drilling extra boreholes at strategic points to pump water to the community and to animal water holes. Over dependence on firewood for fuel and wood to build temporary structures by households has been the main cause of deforestation at the Otwani Village and installing prefabricated homes from recycled materials at the base camp will reduce the pressure on the forest resources.

An EMP is one of the most important outputs of the EA process as it synthesises all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. This EMP

details the environmental compliance audit on the mitigation and monitoring actions that are being implemented during the following phases of these exploration activities:

- Exploration Phase – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor to engage in the exploration for Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals, from the EPL 8474 site to be transported to the various smelters for commercial value addition & Walvis Bay port for export purposes.
- Transportation Phase- the period during which the proponent transports the ore (Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals) from the EPL 8474 to the various smelters for commercial value addition & Walvis Bay port for export.
- Operation and Maintenance – the period during which the services infrastructure will be fully functional and maintained.

The decommissioning of these exploration operations/activities is not envisaged any time soon because if there are viable resource deposits with a feasibility to continue for up to two decades then the proponent will apply for the relevant mining rights; however, in the event that this should be considered some recommendations have been outlined in **Table 12.**

1.3 Environmental Management and Monitoring Plan

This EMP presents a summary of the various impacts as identified from the site visit at EPL 8474 at Otwani, Opuwo Rural Constituency, Kunene Region, Namibia, and the mitigation measures that must be put in place at the exploration site in order to reduce the negative impacts of the project on the environment. The proponent, **Blue Spade Construction CC** is encouraged to implement the recommendations raised herein. It must be noted that environmental management is an on-going process and must be continuously reviewed to review and correct other impacts that may arise and may not have been obvious at each stage of the project.

The EPL 8474 owned by Blue Spade Construction CC are currently at the initial stages of the project cycle, with exploration yet to commence and operations will initially be limited to one active exploration site, and they will upscale if deemed profitable. **Table 1** outlines the Environmental Management Plan that

must be implemented at all the exploration sites on EPL 8474 and by Blue Spade Construction CC to promote environmental sustainability.

Table 1: Environmental Management Plan

Construction of crusher site and mining phase				
Potential Impact	**Possible Cause**	**Mitigation**	**Monitoring Agent**	**Time Frame**
Physical				
Dust generation	-Grading& gravelling existing access roads -Site clearing for building workers compound, crusher site, workshop, and offices	-Avoid maintaining roads under strong winds. -Selective clearing of vegetation. -Minimise burning of cleared vegetation. -Planting of trees around the mine to act as a wind breaker.	Roads Authority, MAWLR., MEFT:DEA	Daily. Weekly, Quarterly
Disturbance and Contamination of ground water	-Drilling of boreholes	-Engage experts in borehole drilling -Boreholes to be approved by MAWLR- Hydrology Department -Water to be put in settling ponds before discharge to the environment -Recycle as much water as possible	MAWLR	Once off
Biological				
Deforestation and Habitat loss	-Site construction -Noise from heavy equipment -Dust from exploration operations/activities and site clearing	-Selective cutting down of trees -Re-vegetate cleared areas, where necessary -Machines to be fitted with sound silencers -Regular watering of the mine site to minimise dust	ECO; MAWLR, MEFT:DEA	Weekly, Quarterly
Injury or death of livestock	-Livestock falling in unprotected trenches -Livestock being run over by heavy vehicles	-Fence off the mine workings -No unauthorised entry should be allowed -Put danger warning signs -Barricade the whole project site with a perimeter fence	ECO; MAWLR, MEFT: DEA; MME	Once off
Fire hazard	-No fire guards in place -Haphazard workings -No explosive box in site	-Establish and maintain fire guards -Establish structures according to the Siting of Works plan approved by the Ministry of Mines & Energy	ECO; MEFT:DEA; MME	Biannually

		-Engage the Regional Mining Engineer in the licensing of a proper magazine box		
Operational phase				
Physical				
Air and Noise Pollution	-Dust generated from blasting -Dust generated from ore movement activities like loading and transportation -Exhaust fumes from vehicles and other equipment -Noise from drilling and blasting -Noise from heavy vehicles and equipment engines	-Undertake controlled blasting; -Set enough lead times between blasting and mining -Blasting to be done during the day; -Establish blasting times and erect signs to that effect. -The local community should be notified using the prescribed channels via the Otwani Village Traditional Authority and be aware of the blasting schedule and take all the necessary precautions to avoid the blast sites and also plan their daily activities with the full understanding of the blasting activities and exploration operations/activities. -Workers to be equipped with ear muffs and inhalers; -Proper vehicle maintenance to reduce exhaust fumes and vehicles should be switched key off when not in operation to reduce noise pollution. -A 10km/hr speed limit should be observed within the vicinity of the copper mine. -Put speed warning signs around the mining area -Vehicles to be fitted with silencers -Regular watering of the mining area to suppress dust	ECO;MEFT:DEA ; MME	Daily, weekly, quarterly.
Land degradation & loss of aesthetic value	-Oil and diesel spillages from vehicles and equipment	-Regular servicing of vehicles -Selective land clearing i.e. clearing where necessary	ECO;MEFT:DEA ; Ministry of Mines & Energy(MME)	Daily, Weekly

	-Land clearing for increased exploration operations/activities	-Mining activities to adhere to Minerals (Prospecting & Mining Act, 1992 (Act No. 33 of 1992) -Avoid vehicle overloading		
Soil Erosion& Contamination of Surface Water	-Surface run off from mine waste water -Contamination due to oil and diesel spills -Dust from ore hauling and loading activities	-Recycling of water -Terrace the steep slopes to minimise surface run off -Oil and diesel spillages should be effectively contained by constantly checking the vehicles and machinery and those with leaks should be fitted with drip trays. -Implement procedures to minimise drop height between the tipper and front end loader.	ECO; MAWLR, MEFT:DEA; Ministry of Mines & Energy(MME)	Daily, Weekly
Biological/ Ecological				
Deforestation and loss of biodiversity	-Vegetation clearing for mining expansion -Dust settling on foliage	-Any expansion to be approved by the Mining Commissioner and the Regional Mining Engineer -Avoid indiscriminate cutting down of trees -Minimise dust emission -Establish vegetation perimeter around the mining area to trap dust	ECO; MAWLR, MEFT:DEA; Ministry of Mines & Energy(MME)	Daily, weekly, quarterly
Siltation of nearby ephemeral streams and Disturbance of Aquatic Life	-Dust generated settling in the river (ephemeral) -Surface run off from mine site	-Minimise dust by watering the mine area -Encourage water recycling -Water sampling to test impurities	ECO; MAWLR, MEFT:DEA; Ministry of Mines & Energy(MME)	Daily, Weekly
Impact to ecosystem food chains	-Birds migration due to noise and dust from blasting and heavy equipment -Land clearing -Dissolved nutrients in water drawn from the mine	-Selective vegetation clearing -Mine water should be recycled -Establish water sampling points -Regular monitoring of water quality in nearby rivers	ECO; MAWLR, MEFT:DEA; Ministry of Mines & Energy(MME)	Quarterly

Socio-Economic				
Occupational health and safety hazards	-Poor sanitary conditions -Poor mechanisation of workings -Lack of proper PPE -Dust related illnesses -High risk of STIs, HIV and AIDS	-Construct proper/functional toilets for workers -Provision of clean and safe water from a borehole -Adequate lighting and ventilation should be provided in the workings -Adequate PPE to be provided to all employees -No machine drilling shall be done dry as per Minerals (Prospecting & Mining) Act, 1992 (Act No. 33 of 1992). -Abide to the stipulated Covid19 regulations to prevent infections and to isolate and quarantine suspected cases at the designated centres. Keep a register of all visitors to the mine to enable contact tracing if the need arises. -Institute HIV& AIDS awareness programs at the mine -Condoms should be easily accessible at the mine -Provision of a fully equipped First Aid kit with no expired medication.	ECO; Ministry of Health & Social Services (MHSS); Social Security Commission (SSC); Ministry of Mines & Energy (MME)	Quarterly -Daily
Injury to people and animals	-Falling into unprotected mine workings -Dangers of flying rocks from blasting -Accidents due to poor OSH procedures	-Establish a perimeter fence around the mine premises -No unauthorised entry into the mine -Barricade the mine workings -Establish blasting times and erect danger warning signs -Blasting to be carried out during the day. -Only primary blasting to be done. -Local community to be notified and aware of the blasting schedule and associated activities.	ECO; Ministry of Health & Social Services (MHSS); Ministry of Mines & Energy (MME); Social Security Commission (SSC)	Once off

		-Implement proper OSH procedures in line with Minerals (Prospecting & Mining Act, 1992 (Act No. 33 of 1992).		

1.4 Environmental & Social Monitoring Plan

An Environmental monitoring plan has been put in place to check on the effectiveness of the Environmental Management Plan in dealing with the impacts identified in this assessment. Some of the environmental parameters that need to be monitored at the exploration site on EPL 8474 are:

a) Dissolved Metals and Metals in Sediments: - cadmium, arsenic, chromium, copper, iron, lead, mercury, nickel, silver, and zinc
b) Conductivity
c) Total Suspended Solids
d) pH
e) Safety of workings
f) Employee Health- TB, asthma, lung cancer, hearing ability, sight, backbone
g) Workers' insurance - Social Security Commission (SSC) contributions

Samples of water shall be drawn from sunk boreholes as exploration operations/activities continue, to determine the composition of water with respect to dissolved heavy metals like cadmium, lead, copper, nickel, zinc, chromium, mercury, and arsenic. Quarterly samples must be drawn to determine how the results vary from the baseline studies. The same will be done for conductivity, total suspended solids, and pH. Water drawn from boreholes at the mine shall be subjected to quarterly samples to determine the degree of leachates as well the pH and conductivity of water.

Quarterly medical checks should be done on employees who work in dusty areas and those that work with heavy machines and their records should be kept at the mine. Aspects to be checked are Covid19 antibody presents, tuberculosis, asthma, lung cancer, hearing ability and backache, among other issues. This will determine the effectiveness of the mine's Occupational Safety and Health (OSH) programmes.

Experience has shown that most mines do not remit moneys they deduct from employees to SSC as per Social Security Act, 1994 (Act No. 34 of 1994), currently read with the Employees' Compensation Act, 1941 (Act No. 30 of 1941) as amended. Due to that, it is now necessary to monitor such mines and make sure that workers are insured against death or injury at work. Contributions must be remitted as and when they are required. Table 2 details the monitoring program that must be followed at the mine.

Table 2: Environmental Monitoring plan

Environmental Aspect	Method of Monitoring	Regulation Body/Org	Frequency
-Dissolved Metals/ Metals in Sediments (cadmium, arsenic, chromium, copper, iron, lead, mercury, silver and zinc) -Conductivity -pH -Total Suspended Solids	-Water sampling at a point in the nearby stream -Borehole water samples	-MAWLR -MEFT:DEA	Quarterly
Safety of Workings -gases, fumes, blasting equipment	-Monitoring before and after blasting	-ECO -Regional Mining Engineer -SSC	Twice daily
Employee Health - TB, asthma, lung cancer, hearing ability, backbone	-Regular Medical checks for any person showing signs and symptoms of any disease.	-ECO -MHSS, -SSC	Quarterly
Workers' insurance	-Checking with NSSA	-SSC -Namibia Miners Federation	Monthly

1.5 Emergency Response Plan

The Emergency Response Plan is a set of measures that will be implemented, in response to emergency situations that could potentially occur during mining and mining-related activities. The Emergency Response plan addresses emergency response elements including identification of potential emergency scenarios, emergency response organisations and responsibilities, co-ordination with governmental emergency response organisations, emergency alarms and communication, emergency response procedures (including evacuation procedures), emergency response equipment, training and drills for the operation of all the proponent' s project facilities at all the EPL 8474. Please find the Emergency Numbers below:

OPUWO

Ambulance	**+264 (65) 27-0326**
Electricity	**+264 (65) 27-3076**
Clinic	**+264 (65) 27-3026**
Police	**+264 (65) 27-3041**
Water & Sewage	**+264 (65) 27-3007**

1.5.1 Risk Assessment Methodology

For the purposes of this mining project, we will make use of the NOSA HIRA (Hazard Identification and Risk Assessment) methodology. The methodology comprises three parameters, namely:

(a) Severity

This is an evaluation of the worst conceivable SHE consequence of a hazard. An exponential weighting is used in order to reflect a bias towards the consideration of the severity of the consequences as opposed to frequency or exposure when evaluating a hazard. The criteria for rating severity are shown in Table 3.

Table 3: Severity Criteria

Weight Number	Hazard Description	Environment	Safety/ Health
16	CATASTROPHIC	Irreversible ecological damage	Multiple fatalities due to injury or occupational diseases
8	MAJOR	Reversible ecological damage with potential long-term impact	Fatality or number of disabilities/ disabling diseases
4	MODERATE	Ecological disturbance, can be rehabilitated	Disabling injuries or occupational illness
2	MINOR	Short-term ecological impacts. Requires intervention	Minor injuries or exposure requiring medical attention
1	INSIGNIFICANT	Low impact, natural rehabilitation	First Aid treatment required

(b) Frequency /Probability

Frequency/ Probability are a linear evaluation of how often a hazard has resulted in a consequence (incident history). In the absence of incident history how often a hazard may result in a known consequence (established through industry standards and research and assumption if needed) may be used. The Frequency/ Probability criteria are shown in the Table 4.

Table 4: Frequency/ Probability Criteria

Weight Number	1	2	3	4	5
Evaluation Description	Rare	Infrequent	Frequent	Often	Consistent
Frequency	Less than once every 5 years	Every 1- 5 years	Multiple times per year	Monthly	Daily/weekly

(c) Exposure

Exposure is the percentage of a workforce exposed to a particular hazard and or the duration of the exposure. Its rating is shown in Table 5.

Table 5: Exposure Criteria

Weight Number	1	2	3	4	5
Evaluation Description	Minimal	Restricted	Local	Widespread	Extensive
Safety/ Health Exposure	A few of the workforce, minimal time	A few of the workforce, some of the time / some of the workforce minimal time	Some of the workforce, some of the time	Most of the workforce, some of the time or / some of the workforce, most of the time	Most of the workforce, most of the time
Environmental Exposure	Incident site	Localised	Plant wide	Immediate neighbours	Community exposure

NB: Risk is calculated as follows: **Risk= Severity × Frequency × Exposure**

Table 6: Emergency Response Plan

Risk	**Contingency Plan**
Fire hazard	-Fire extinguishers to be put in place -Workers training on use of extinguishers -Fire Brigade contact numbers to be clearly displayed -Emergency numbers to be given to every worker (See **Section 1.5** above) -Establish an Assembly point -Fire drills -Fireguards
Power generator failure	-Standby generator to be put in place -Standby fuel storage facility to be kept separately
Outbreak of infectious disease	-Isolate the infected person(s) -Take the person to hospital -Mine vehicle to be on site every time -Calling the ambulance -Emergence numbers to be given to every worker

2 ROLES AND RESPONSIBILITIES

Blue Spade Construction CC, who is the proponent, is ultimately responsible for the implementation of the EMP, from the planning and design phase to the decommissioning phase (when these exploration operations/activities are no longer financially viable). The proponent will delegate this responsibility as the project progresses through its life cycle. The delegated responsibility for the effective implementation of this EMP will rest on the following key individuals:

- Proponent's Representative;
- Environmental Control Officer; and
- Contractor (Blue Spade Construction CC).

2.1 PROPONENT'S REPRESENTATIVE

The proponent should assign the responsibility of managing all aspects of these exploration activities for all lifecycle phases (including all contracts for work outsourced) to a designated member of staff, referred to in this EMP as the Proponent's Representative (PR). The proponent may decide to assign this role to one person for the full duration of these exploration activities or may assign a different PR to each of the lifecycle phases – i.e., one for the exploration phase, one for the transportation phase and one for the mine rehabilitation phase. The PR's responsibilities are as follows:

Table 7: Responsibilities of PR

Responsibility	Project Phase
Making sure that the necessary approvals and permissions laid out in **Table 9** are obtained/adhered to	Throughout the lifecycle of this project.
Suspending/evicting individuals and/or equipment not complying with the EMP	• **Exploration** • **Transportation of mineral resources** • **Mine rehabilitation**
Issuing fines for contravening EMP provisions	• **Exploration** • **Transportation of mineral resources** • **Mine rehabilitation**

2.2 ENVIRONMENTAL CONTROL OFFICER

The PR should assign the responsibility of overseeing the implementation of the whole EMP on the ground during the exploration & mine rehabilitation phases to a designated member of staff, referred to in this EMP as the Environmental Control Officer (ECO). The PR/ Blue Spade Construction CC may decide to assign this role to one person for all three activities or may assign a different ECO for each activity. The ECO will have the following responsibilities during the mining, operation, and rehabilitation phases of these developments:

- Management and facilitation of communication between the Proponent, PR, the contractors, and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting regular inspections (recommended minimum frequency is once every six months) with respect to the implementation of this EMP (monitor and audit the implementation of the EMP);
- Assisting the Contractor in finding solutions with respect to matters pertaining to the implementation of this EMP;
- Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

2.3 CONTRACTOR

Contractors appointed by the Proponent are automatically responsible for implementing all provisions contained within the relevant chapters of this updated EMP. Contractors will be responsible for the implementation of this EMP applicable to any work outsourced to subcontractors. **Table 10** applies to contractors appointed during the exploration phase and **Table 11** to those

appointed during the Mine rehabilitation phase. In order to ensure effective environmental management, the aforementioned chapters should be included in the applicable contracts for outsourced construction, operation and maintenance work.

The tables in the following chapter (**Chapter 3**) detail the management measures associated with the roles and responsibilities that have been laid out in this chapter.

3.0 MANAGEMENT ACTIONS

The aim of the management actions in this chapter of the updated EMP is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

The following tables provide the management actions recommended to manage the potential impacts rated in the scoping-level EA conducted for these activities. These management actions have been organised temporally according to project phase:

- Applicable legislation (**Table 9**);
- exploration Actions (**Table 10**);
- Mine rehabilitation Management Actions (**Table 11**); and
- Decommissioning phase management actions (**Table 12**).

The responsible persons from the proponents' team have assessed these commitments in detail and have committed to the specific management actions were indicated in the tables below.

3.1 ASSUMPTIONS AND LIMITATIONS

This EMP has been updated and compiled with the acknowledgment of the following assumptions and limitations:

- This EMP has been updated based on the previous scoping-level Environmental Assessment (EA) conducted for the EPL 8474. HEEC will not be held responsible for the potential consequences that may result from any alterations to the existing situation on the ground.
- It is assumed that mine labourers will be sourced mostly from the Otwani Village area and that migrant labourers (if applicable) will be housed in established accommodation facilities within Otwani Village.
- The engineering designs carried out for the mine operations & of the associated services infrastructure (roads, potable water, storm water, sewerage, and electrical reticulations) will be informed by the engineers' plans and designs.

3.2 APPLICABLE LEGISLATION

Legal provisions that have relevance to various aspects of these exploration operations/activities are listed in **Table 9:** Legal provisions relevant to the proposed exploration activities below. The legal instrument, applicable corresponding provisions and project relevance details are provided.

3.2.1 Regulatory Framework for Environmental Management in the Mining Sector

The objective of the Environmental Management Plan (EMP) is thus needed in order to assess the potential social and environmental impacts associated with the proposed exploration activities for on EPL 8474, situated at Otwani, Opuwo Rural Constituency, Kunene Region, Namibia and also to formulate methods of rehabilitation of the quarries once they have been excavated for further processing.

The above is a listed activity in terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012). Dumps, including overburden dumps and tailings dams, are similarly regulated.

In terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012), the following listed activities in **Table 8** were triggered by the proposed project:

Table 8: List of triggered activities identified in the EIA Regulations which apply to the project

Activity description and No(s):	**Description of relevant Activity**	**The portion of the development as per the project description that relates to the applicable listed activity**
Activity 3.1 (Mining and Quarrying Activities)	The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.	The project includes the exploration for Base and Rare Metals, Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals for export purposes/ further processing.
Activity 3.2 (Mining and Quarrying Activities)	Other forms of mining or extraction of any natural resources whether regulated by law or not.	The project includes the exploration for Base and Rare Metals, Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals for export purposes/ further processing.
Activity 3.3 (Mining and Quarrying Activities)	Resource extraction, manipulation, conservation and related activities.	The project includes the exploration for Base and Rare Metals, Base and Rare Metals, Dimension stone, Industrial Minerals, Non-nuclear Fuel Minerals & Precious metals for export purposes/ further processing.

The above activities will be discussed in more detail in this EMP. Healthy Earth Environmental Consultants CC (HEEC) undertook an independent site-specific scoping Environmental & Social Assessment (ESA) in order to formulate detailed mitigation measures for the above activities on behalf of the proponent, Blue Spade Construction CC. The competent authority is the Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs (MEFT: DEA).

There are multiple legal instruments that regulate and have a bearing on good environmental management in Namibia. **Table 9** below provides a summary of the legal instruments considered to be relevant to this development and the environmental assessment process.

Table 9: Legislation applicable for the exploration activities on EPL 8474, situated at Otwani, Opuwo Rural Constituency, Kunene Region, Namibia.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
The Constitution of the Republic of Namibia as Amended	Article 91 (c) provides for duty to guard against "the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia." Article 95(l) deals with the "maintenance of ecosystems, essential ecological processes and biological diversity" and sustainable use of the country's natural resources.	Sustainable development should be at the forefront of management of the intended exploration activities.
Environmental Management Act No. 7 of 2007 (EMA)	Section 2 outlines the objective of the Act and the means to achieve that. Section 3 details the principles of Environmental Management	The management of this project should be informed by the EMA.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate.	**Activity 3.1 (Mining and Quarrying Activities)** The construction of facilities for any process or activities which requires a licence, right or

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	GN 30 provides the regulations governing the environmental assessment (EA) process.	other form of authorisation, and the renewal of a licence, right or other form of authorisation, 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 resources whether regulated by law or not. **Activity 3.3 (Mining and Quarrying Activities)** Resource extraction, manipulation, conservation and related activities.
Convention on Biological Diversity (1992)	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The exploration activities should consider the impact it will have on the biodiversity of the area.
Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)	Part 1, Stage 8 of the guidelines states that if a proposal is likely to affect people, certain guidelines should be considered by the proponent in the scoping process.	The ESA process should incorporate the aspects outlined in the guidelines.
Namibia Vision 2030	Vision 2030 states that the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets.	Care should be taken that the exploration activities do not lead to the degradation of the natural beauty of the area.
Water Act No. 54 of 1956	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.	The pollution of water resources should be avoided during the exploration activities.
The Ministry of Environment, Forestry and	MEFT has recently developed a policy on HIV and AIDS. In addition	The proponent and its contractor have to adhere to the guidelines

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Tourism (MEFT) Policy on HIV & AIDS	it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	provided to manage the aspects of HIV/AIDS. Experience with similar projects has shown that a significant health risk is created when migrant mine workers/labourers interact with local communities.
Labour Act No. 11 of 2007	Chapter 2 details the fundamental rights and protections. Chapter 3 deals with the basic conditions of employment.	Given the employment opportunities presented by the exploration activities, compliance with the law is essential.
Public and Environmental Health Act of 2015	This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually transmitted infections; maternal, ante-natal and neo-natal care; water and food supplies; infant nutrition; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979).	The exploration activities are to comply with these legal requirements.
Nature Conservation Ordinance No. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants.	Indigenous and protected plants must be managed within the legal confines.
Environmental Assessment Policy of Namibia (1995)	The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood, and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.	This EMP considers this term of Environment.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Minerals (Prospecting and Mining) Act, 1992 (Act 33 1 of 1992)	To provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto. "mineral" means any substance, whether in solid, liquid or gaseous form, occurring naturally in, on or under any land and having been formed by, or subjected to, a geological process, excluding -(c) subject to the provisions of subsection (2), soil, sand, clay, gravel or stone (other than rock material specified in Part 2 of Schedule 1) if they are bona fide required for purposes of - (i) agriculture, building works, fencing or road making; (ii) the manufacture of bricks and tiles;	The activity involves the exploration of mineral resources for commercial purposes/further processing.
Soil Conservation Act 6 of 1969 Ministry of Agriculture, Water and Forestry	This Act covers the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources	Open pits left behind after exploration should not be polluted or left un-rehabilitated.

This EMP was formulated and compiled in accordance with the EIA Regulations.

3.3 PROJECT LOCATION

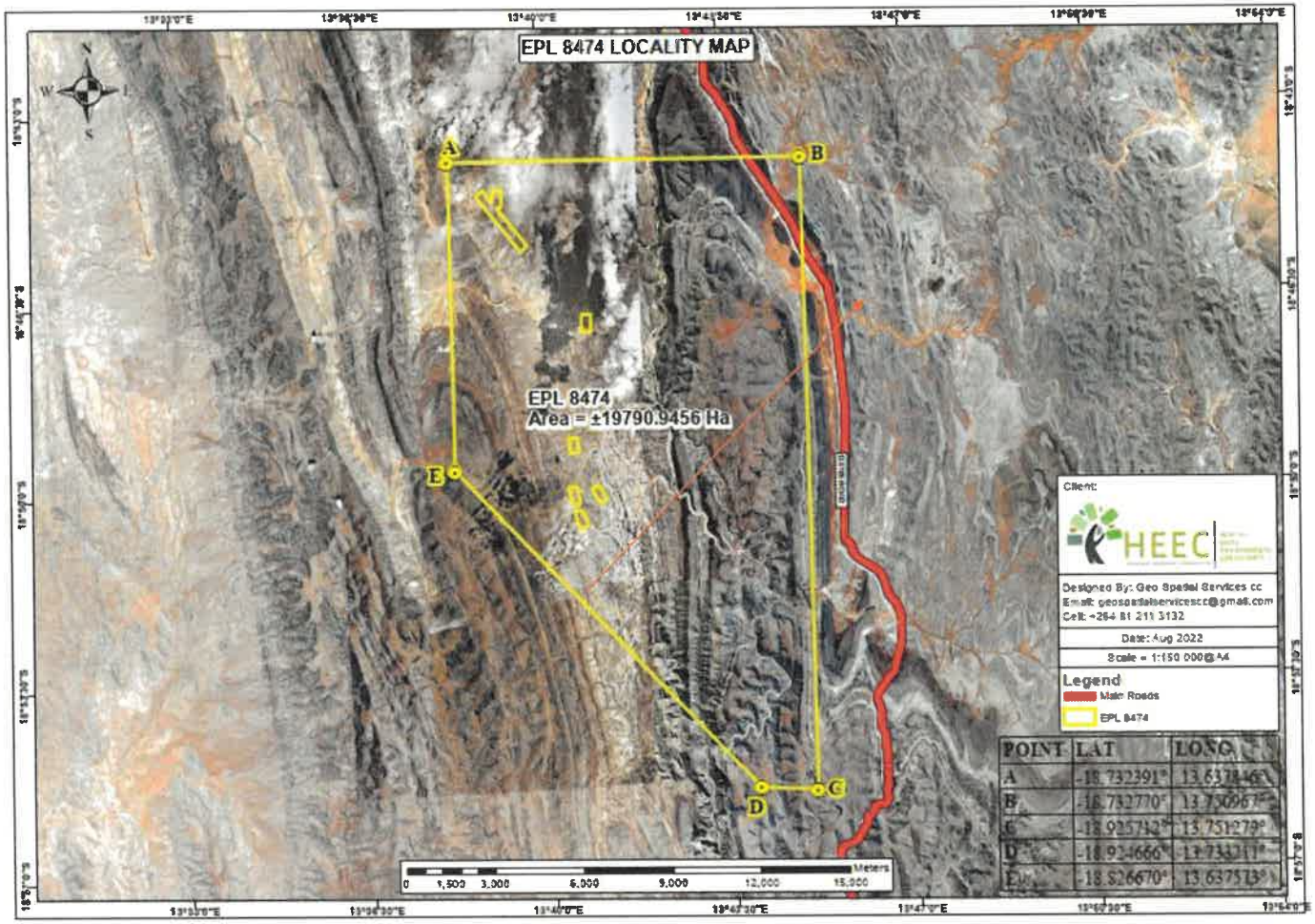

Figure 1: Location of the EPL 8474, situated at Otwani, Opuwo Rural Constituency, Kunene Region, Namibia (HEEC, 2023).

3.4 EXPLORATION PHASE

The PR should ensure that the management actions detailed in **Table 10**, below should be adhered to during the operation of the exploration activities.

Table 10: Exploration Phase Management Actions

Aspect	Management Actions	Responsibility
Environmental Incidents	• The ECO on site shall maintain a register of all environmental incidents occurring as a result of the activities associated with the project. Environmental incidents that shall be recorded include (but are not limited to): ➢ Fires; ➢ Drowning; ➢ Accidents (e.g. traffic); ➢ Spills of hazardous materials, contaminating soil or water resources; ➢ Non-compliances with applicable legislation; and ➢ Non-compliances with this EMP. • Environmental incident reports shall include (as a minimum) a description of the incident, the actions taken to contain any damage to the environment, personnel, or the public, and the actions taken to repair / remediate any such damage. • Additional measures shall be prescribed that may be required to remediate damage resulting from the incident and / or to prevent similar incidents occurring in the future.	ECO
Traffic	• Ensure that road junctions have good sightlines. • Limit the type of vehicle (heavy trucks) allowed on site. • Adhere to the speed limit. If permissible, caution signs and 40 km/hr signs shall be placed at regulation distance from heavy vehicle crossing signs at the intersections of the access tracks and the C43 road. • Designate no-drive zones.	**ECO**

Aspect	Management Actions	Responsibility
	• Implement traffic control measures where necessary by keeping a number plate register of all vehicles transporting the mineral resources at the site and restricting access to authorised contractors.	
Exploration site areas on EPL 8474	• Copper ore should be sourced from EPL 8474 with a valid ECC. • The active exploration site must be clearly demarcated by means of a perimeter stock-proof fence with a lockable gated entrance. • Exploration activities and resultant operations shall only take place within this demarcated area. • A detailed photographic record of the demarcated active site areas, prior to any exploration/mining activities, shall be taken. These records are to be kept by the Proponent and PR for reference purposes during the rehabilitation of the site. • There will be **'No unauthorised access'** signs at the active sites on EPL 8474 entrance gates until to restrict entry and/or harm to people not involved in the exploration operations.	**ECO & Contractor**
EMP training	• All workers at the site are to undergo EMP training that should include as a minimum the following: • Explanation of the importance of complying with the EMP. • Discussion of the potential environmental impacts of the intended exploration and mine rehabilitation activities. • Employees' roles and responsibilities, including emergency preparedness and response requirements. • Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. • The potential consequences of departure from specified operating procedures; and rewards for enhancing mitigation measures or avoiding negative environmental effects.	**ECO & Contractor**
Fauna and Flora	• Prevent the destruction of protected tree species. • Encourage the regrowth and regeneration of trees with exposed roots at the site.	**ECO & Contractor**

Aspect	Management Actions	Responsibility
	• The excavation of the mineral resources should incorporate existing trees[1]. • The Contractor should compile a Tree Management Plan which should include the following as a minimum: • Trees if not already accounted for in an existing Geographic Information System (GIS), should be surveyed, co-ordinates/location incorporated into the Contractor's GIS, marked with paint (or other means so as to be readily visible) and protected; • Trees, which are impossible to conserve, need to be identified and their location recorded on a map; • The Contractor should apply to the relevant authority (Ministry of Environment, Forestry & Tourism) for a permit to remove these trees. • A list should be compiled of all trees to be removed detailing the location of the tree, the species as well as which trees will be planted to replace these. The nursery where these trees will be sourced from should also be included; • Each tree that is removed needs to be replaced with an indigenous tree species; • Some of these trees can be obtained at the nearest forestry office or at a commercial nursery such as the Forestry office in Opuwo. Assistance can be sought from the nearest forestry office regarding nearby nurseries where additional trees may be bought and advice sought. • Only a limited width +/- 5 m on the side of the access roads may be partially cleared of vegetation. • Workers are prohibited from collecting wood or other plant products on or near the site. • No alien species may be planted on or within the existing site. • Prevent contractors from collecting wood and veld food such as amphibians, migrating birds, etc. during the exploration phase. • Prevent contractors from fishing in the nearby ephemeral rivers or catching aquatic species.	

[1]a "tree" is defined as an indigenous woody perennial plant with a trunk diameter ≥150 mm

Aspect	Management Actions	Responsibility
Lay-down areas and materials camp	• Suitable locations for the contractors lay-down areas and materials camp should be identified with the assistance of the PR and the following should be considered in selecting these sites: • The areas designated for the services infrastructure should be used as far as possible. • Second option should be degraded land. • Avoid sensitive areas (e.g. wetlands/rivers/drainage lines)	**ECO & Contractor**
Hazardous waste	• All heavy duty vehicles and equipment on site should be provided with a drip tray. • All heavy duty delivery vehicles should be maintained regularly to prevent oil leakages. • Maintenance and washing of vehicles should take place only at a designated workshop area. • Spilled cement and/or concrete (wet or dry) should be treated as hazardous waste and disposed of by the end of each day in the appropriate hazardous waste containers. • All hazardous substances (e.g. fuel etc.) or chemicals should be stored in a specific location on an impermeable surface that is bunded - with a volume of 120 % of the largest single storage container or 25 % of the total storage containers, whichever is greater.	**ECO & Contractor**
Surface and Ground Water Impacts	• It is recommended that exploration takes place outside of the rainy season in order to limit erosion & flooding on site and surface water pollution. • No dumping of waste products of any kind in or in close proximity to surface water bodies. • Heavy duty vehicles should be kept out of any surface water bodies and the movement of vehicles should be limited where possible to the existing access roads and tracks. • Contaminated runoff from the sites should be prevented from entering the surface water bodies. • Workers should be given ablution facilities at the sites that are located at least **30 m** away from any surface water and regularly serviced. • Washing of personnel or any equipment should not be allowed on site.	**ECO & Contractor**

Aspect	Management Actions	Responsibility
Topsoil	• When excavations are carried out, topsoil[2] should be stockpiled in a demarcated area and used in profiling and rehabilitating of the depleted, open pits around the exploration sites. • Stockpiled topsoil should be used to rehabilitate post-harvesting degraded areas and/or other nearby degraded areas within the Otwani Village area in consultation with the Traditional Authority.	**ECO & Contractor**
Soil Erosion	• Clear the vegetation of the project area in phases during the exploration period in order to keep the soil more compacted as well as to limit overall disturbance to the area over time. • It is recommended that most exploration takes place outside of the rainy season in order to limit potential flooding and the run off of loose soil causing further erosion. • Appropriate erosion control structures must be put in place where soil may be prone to erosion. • Checks must be carried out at regular intervals to identify areas within the exploration site where erosion is occurring. Appropriate remedial actions are to be undertaken wherever erosion is evident.	**ECO & Contractor**
Rehabilitation	• Upon completion of the exploration phase consultations should be held with the Traditional Authority & local community regarding the post-exploration use of remaining excavated areas (if applicable) and to identify priority areas. • Sand/rubble at the site should be levelled so it can be reclaimed for other purposes once the exploration has ceased and rather than leaving the mines open which will pose a threat to people and animals in the area. • In the event that no post-operation uses are requested, all excavated/degraded areas need to be rehabilitated as follows: • Excavated areas may only be backfilled with clean or inert fill. No material of hazardous nature (e.g., sand removed with an oil spill) may be dumped as backfill. • Rehabilitated excavated areas need to match the contours of the existing landscape.	**ECO & Contractor**

[2] Topsoil is defined here as the top 150mm of surface material, which accounts for the seedbank.

Aspect	Management Actions	Responsibility
	• The rehabilitated area should not be higher (or lower) than nearby drainage channels. This ensures the efficiency of re-vegetation and reduces the chances of potential erosion. • Topsoil is to be spread across excavated areas evenly. • Deep ripping of areas to be rehabilitated is required, not just simple scarification, so as to enable rip lines to hold water after heavy rainfall. • Ripping should be done along slopes, not up and down a slope, which could lead to enhanced erosion.	
HIV/AIDS and TB awareness	• The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the project operation. • A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases. • Provide free condoms in the workplace and to local community throughout project operation. • Facilitate access to Antiretroviral medication • Personnel should not overnight at the exploration sites, but only the security personnel.	**ECO & Contractor**
Road safety	• Demarcate roads clearly. • Off-road driving should not be allowed. • All vehicles that transport materials to and from the site must be roadworthy. • Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. • Loads upon vehicles should be properly secured to avoid items falling off the vehicle. • Limit and control the number of access points to the exploration sites. • The road leading to the EPL 8474 should be properly maintained so as to reduce dust emissions when heavy vehicles travel on them. • Consideration should be given to possibly tar the road leading to the EPL 8474 which could reduce dust emissions onsite.	**ECO & Contractor**
Safety around work sites	• Excavations/pits should be left open for the shortest time possible.	**ECO & Contractor**

Aspect	Management Actions	Responsibility
	• Excavate short lengths of trenches and box areas for services or foundations in a manner that will not leave the trench unattended for more than 24 hours. • Demarcate excavated areas and topsoil stockpiles with danger tape. • Provide additional warning signage in areas of movement and in "no personnel" areas where workers are not active. • Mine pits are to be fenced-off with stock-proof perimeter fencing. • Work areas must be set out and isolated with danger tape on a daily basis. • All materials and equipment are to be stored only within set out and demarcated work areas. • Only exploration personnel authorised by Blue Spade Construction CC will be allowed within these work areas. • 2 fire extinguishers should be available at fuel storage areas. • Comply with all waste related management actions stated above in this table.	
Ablutions	• Separate toilets should be available for men and women and should clearly be indicated as such. • Portable toilets (i.e., easily transportable) should be available at the Mine site: • 1 toilet for every 15 females. • 1 toilet for every 30 males. • Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site. Alternatively, sewage may be pumped into sealable containers and stored until it can be removed. • Workers responsible for cleaning the toilets should be provided with latex gloves and masks.	**ECO & Contractor**
Open fires	• No open fires may be made anywhere on the exploration sites.	**ECO**
General health and safety	• A fully stocked first aid kit should permanently be available on-site as well as an adequately trained member of staff capable of administering first aid. • All workers should have access to the relevant personal protective equipment (overalls, hard toe boots, goggles, dust masks, sun hats heavy duty gloves etc.) including Covid19 PPE (masks & sanitisers etc.).	**ECO & Contractor**

Aspect	Management Actions	Responsibility
	• Sufficient potable water reserves should be always available to workers. • No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable). • No workers should be allowed to drink alcohol during work hours. • No workers should be allowed on the EPL 8474 if under the influence of alcohol.	
Dust	• A watering truck should be used on gravel roads with the heaviest vehicle movement especially during dry and windy conditions. However, due consideration should be given to water restrictions during times of drought. • The use of waterless dust suppression means (e.g., lignosulphonate products such as Dustex) should be considered. • Cover any stockpiles with plastic to minimise windblown dust. • Dust protection masks should be provided to workers if they complain about dust. • During high wind conditions the contractor must make the decision to cease works until the wind has calmed down.	**ECO & Contractor**
Noise	• Work hours should be restricted to between 08h00 and 17h00 where excavation involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas. If an exception to this provision is required, all residents and business owners within the 500 m radius should be given 1 week's written notice. • If workers are to be exposed to noise levels above 85dB for continuous extended periods of more than two hours, they are to be provided with earmuffs and allowed to take 10-15 minute breaks away from the noise source.	**ECO & Contractor**
Recruitment of labourers	• The Contractor should compile a formal recruitment process including the following provisions as a minimum: • Adhere to the legal provisions in the Labour Act No. 11 of 2007 for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.).	**ECO & Contractor**

Aspect	Management Actions	Responsibility
	• Recruitment should not take place at the exploration site. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside these agreed upon procedures. • All contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those who are qualified and from the project area and only then look to surrounding towns. • Clearly explain to all job-seekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary.	
Communication plan	• The Contractor or PR should draft a Communication Plan, which should outline as a minimum the following: • How Interested and Affected Parties (I&APs), who require on-going communication for the duration of the operation period, will be identified and recorded and who will manage and update these records; • How these I&APs will be consulted on an on-going basis; • Make provision for grievance mechanisms – i.e., how concerns can be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event that feedback is deemed unsatisfactory.	**ECO & Contractor**
General communication	• The PR must appoint an ECO to liaise between the Contractor, I&APs and Blue Spade Construction CC's management. • The Contractor shall at every bi-monthly site meeting report on the status of the implementation of all provisions of the EMP. • The Contractor should implement the EMP awareness training as stipulated above in this table. • The Contractor must list the I&APs of the project and their contact details with whom on-going communication would be required for the duration of the contract. This list, together with the Communication Plan must be agreed upon and given to the PR before operation commences/resumes. • The Communication Plan, once agreed upon by the Traditional Authority, shall be legally binding.	**ECO & Contractor**

Aspect	Management Actions	Responsibility
	• A copy of the EMP must be available at the site office and should be accessible to all I&APs. • Key representatives from the above-mentioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding progress to rehabilitate the excavated areas and surrounding mines/ pits. • The Contractor should liaise with the proponent regarding all issues related to community consultation and negotiation before operation commences/resumes. • A procedure should be put in place to ensure that concerns raised have been followed-up and addressed. • All people on the I&APs list should be informed about the availability of the complaints register and associated grievance mechanisms in writing by the PR prior to the commencement of site activities.	
Archaeology	• Should a heritage site or archaeological site be uncovered or discovered during the exploration phase of the project, a "chance find" procedure should be applied in the order they appear below: • If operating machinery or equipment stop work; • Demarcate the site with danger tape; • Determine GPS position if possible; • Report findings to the site foreman; • Report findings, site location and actions taken to superintendent; • Cease any works in immediate vicinity; • Visit find site and determine whether work can proceed without damage to findings; • Determine and demarcate exclusion boundary; • Site location and details to be added to a Geographic Information System (GIS) for field confirmation by archaeologist; • Inspect site and confirm addition to exploration site GIS; • Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and • Recovery, packaging and labelling of findings for transfer to National Museum. • Should human remains be found, the following actions will be required:	**ECO & Contractor**

Aspect	Management Actions	Responsibility
	• Apply the chance find procedure as described above; • Schedule a field inspection with an archaeologist to confirm that remains are human; • Advise and liaise with the NHC and Police; and • Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.	

3.5 MINE REHABILITATION PHASE (Continuous)

The management actions included in **Table 11** below applies during the continuous mine rehabilitation phase of the exploration operations/activities.

Table 11: Mine Rehabilitation Phase Management actions

Environmental Feature	Management Actions	Responsibility
EMP training	All contractors appointed for the transportation of the mineral resources on EPL 8474 must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work.	ECO & Contractor
Monitoring	The ECO should monitor the implementation of the EMP: • The ECO should regularly inspect the conditions around the exploration site before work starts; and • The ECO should inspect the exploration site at the end of the extraction period.	ECO
Water and waste management	• Ensure that the infrastructure at the active exploration site is connected to the natural drainage and wastewater reticulation system available. • Regular preventative maintenance should be carried out on the infrastructure to ensure that risks of overspills are minimised. • A no-go buffer area of at least **30 m** should be allocated to any water bodies in the area. • No dumping of waste products of any kind in or in close proximity to any surface water bodies.	ECO & Contractor

Environmental Feature	Management Actions	Responsibility
	• Sufficient weather and scavenger-proof bins (with lids, to prevent the escape of litter) shall be provided and be easily accessible at all points where wastes are generated. • The site shall be kept clean and free of litter and no litter from the site shall be allowed to disperse to surrounding areas. • All personnel shall be instructed to dispose of all waste in the proper manner. • The Contractor shall identify and separate materials that can be reused or recycled to minimise waste e.g., metals, packaging and plastics, and provide separate marked bins for these items. • All materials (e.g., bags of cement) must be suitably stored and protected, so that they do not become damaged and unusable. • The Contractor shall be responsible for the regular disposal (at a suitable waste rock dumpsite) of all waste generated as a result of the exploration. • Contaminated runoff from the various operational activities should be prevented from entering any surface water bodies. • Ensure that surface water accumulating on-site are channelled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment. • Disposal of waste from the EPL 8474 should be properly managed. • No waste may be burned on site. • The frequency of collections will be such that waste containment receptacles do not unduly accumulate or overflow.	

Environmental Feature	Management Actions	Responsibility
Energy efficiency	• The use of solar energy should be encouraged to provide for general lighting and heating of water and buildings around the mine sites. • The use of water saving initiatives should be incorporated within the mine workers' housing design to reduce water demand.	Contractor

3.6 DECOMMISSIONING PHASE

With time all mines will close. This phase normally presents a complete new set of impacts to the environment that require serious attention of the mining company and other local authorities. To that effect a well-planned mine closure programme should be put in place.

It is recommended that in the event of mine closure, decommissioning be carried as per guidelines stated in relevant extracts of the Minerals (Prospecting & Mining) Act, 1992 (Act No. 33 of 1992). Rehabilitation must be taken as an on-going process to ensure that corrective measures are implemented on time. **Table 12** is a guideline to the decommissioning plan, whereby an active care mine closure is going to be implemented.

Table 12: Decommissioning plan

Decommissioning Phase			
Possible Impact	**Mitigation**	**Responsibility**	**Monitoring Agent**
Physical/Biological -Land degradation& loss of aesthetic value	-Establish a vegetation cover as soon as possible (stabilization) -Vegetate cleared area with indigenous trees -Fencing of the dangerous areas	MINE OWNER	-ECO -MEFT, -MAWLR
-Injury to people and livestock	-Complete filling up of the trenches -Barricade the old workings with concrete -Fencing of the dangerous areas	MINE OWNER	-ECO -MEFT, -MAWLR
-Contaminated surface and underground water. -Soil pollution. -Acid water drainage	-clean up spills (chemicals, diesel and oil) -Water quality analysis. -Monitor soil and water quality for a specified time after closure. -Aquatic life monitoring	MINE OWNER	-ECO -MEFT, -MAWLR
Resurgence of hazardous chemicals	-Treatment of hazardous chemicals (if any) -Neutralization -Precipitation, oxidation, reduction and acid/alkali hydrolysis	MINE OWNER	-ECO -MEFT, -MAWLR -MHSS
Accumulated solid waste	-Disposal of solid waste through source sorting, recycling, aerobic	MINE OWNER	-ECO -MEFT, -MAWLR

	decomposition (composition), incineration or depositing in waste rock dumpsite and levelling of dumpsite to match the natural contours of the surrounding topography.		-MHSS
Loss of biodiversity	-Eliminate environmental damage through reclamation. -Site restoration through regeneration of the forest. -Restore chemical, biological and physical stability of site. -Allow productive land use.	MINE OWNER	-ECO -MEFT, -MAWLR
Compacted soil	-Rehabilitate areas affected by excessive soil compaction and oil spillage	MINE OWNER	-ECO -MEFT, -MAWLR -MME
Social/Economic -Laying off workers -Loss of income -Drop in the standard of living	-Catering of welfare of laid off workers -Pension schemes -Creation of income generating projects for laid off workers -Secure alternative employment for workers	MINE OWNER	-ECO -SSC
-Infrastructure may become derelict -Derelict building may detract from the value of surrounding properties	-Return of community access to infrastructure -Educate locals on the utilization of the mining infrastructure.	MINE OWNER	Ministry of Works and Transport
-Possible outbreaks of diseases	Educate communities on dangers of STIs and waterborne diseases	MINE OWNER	Ministry of Health & Social Services(MHSS)
Damaged roads	Repair damaged roads	MINE OWNER	-Roads Authority

In addition to the plan above, decommissioning should also be carried out as per the following guidelines:

- The Proponent/Owners and Managers of all mines should be capable of implementing responsible environmental management practices. The preparation of environmental management plans will facilitate this process and is strongly encouraged.
- All mines should be rehabilitated either progressively or at the end of mining. Each exploration site should be left in a safe well drained and maintenance-free state, blending in as much as possible with the surrounding landscape.
- Mine operators should ensure that funds are available for progressive and final site (closure) rehabilitation.
- Unless otherwise approved (by an Inspector of mines) at mining closure, all machinery structures and buildings should be removed from the site and concentrate slabs broken up and buried. The site should be ripped; top soiled (if available), fertilized and re-vegetated using indigenous plant species. Alternatively, if approved, certain structures can remain for the benefit of the next land user.
- Surface and ground waters should be effectively managed to prevent contamination by exploration operations/activities.

- Effluent from mining and milling operations, i.e tailings should be effectively contained and only released into the environment if the water quality satisfies the standards of the **Water Quality Guidelines (Annexure A).**

- Measures to be taken to control noise and dust from mining/milling/hauling operations to ensure a comfortable and health working environment as specified in the **Labour Act No. 11 of 2007.**

- Measures should be taken to minimise excessive ground vibrations and air-blasts over pressure due to blasting. Peak particle velocities of 5 mm/sec and air-blasts over pressures of 120 dB (peak) should not be exceeded at the boundaries of the active site areas on EPL 8474.

- Mine operators should ensure that refuse is deposited in proper containers and disposed of responsibly. Fuel and oil spills should be effectively contained.

- Where practical, buildings, crushing plant, stockpiles and dumps should be designed and located to reduce visual impact. Advantage should be taken of natural topography and exciting vegetation and if this not a practical option, a screen of trees should be established.

- Measures should be taken to prevent or minimise soil erosion.

- As far as is practical, topsoil should be stripped from all areas to be distributed by exploration operations/activities/milling and used immediately if possible or preserved for later rehabilitation.

- Areas disturbed by mining should be re-vegetated as far as is practical using indigenous grass or tree species. However, on sites such as tailings/waste dumps, where it is important to establish a vegetative cover as soon as possible on difficult growing mediums, the use of fast growing exotic species is acceptable .Care should be taken to prevent the entry and spread of noxious plants.

- Diversion channels or ephemeral river course diversion should be constructed in accordance with sound engineering principles to ensure that soil erosion is minimised.

- Cyanide, mercury, dynamite, and other toxic materials should be transported stored and handled in a safe and acceptable manner. They should be stored in safe place, fenced to prevent entry of unauthorised persons. The owner /manager should ensure that toxic materials do not escape into the surrounding rivers/ground waters.

- Mine operators should strive to conserve local flora and fauna species and avoid unnecessary destruction of both.

- Unique archaeological, historical, geological, and scenic features should be protected at all mining and exploration sites.

- Residents of Otwani Village in the vicinity of the mine should not be subjected to excessive airborne emissions (including dust, gases, and smokes), liquid effluent, noise, ground vibrations and air blast from mining/milling/refining/haulage operations.

- Mine tailings and slimes should be disposed of/stored in impoundments constructed in accordance with sound engineering principles. The dams should be sited to avoid the encountering of permeable sub-soil and/or fracture systems and an adequate drainage system should be incorporated in the design. They should be sited so that their catchments are minimal and should be designed to withstand significant rainfall events.

- Unless otherwise approved, at the cessation of mining, or earlier if practical, waste rock dumps should be stabilized by reducing the slope angle and re-vegetated. Topsoil should be used if practicable.
- All shafts not being used should be securely capped/otherwise made safe to prevent the entry of persons/livestock/wild animals.
- The final land use of open cast mine /quarry should be determined prior to the cessation of mining. For example, if the site is to be used for water storage, then at the end of the mine life, drainage could be directed into the pit. If the pit/quarry is to be used for any other purpose then drainage should not be diverted around the site.
- The final land use will dictate the amount of reshaping required on the pit faces. Where practical the slope of the steep faces should be reduced and benches top soiled (if available) to facilitate re-vegetation and blending with the surrounding landscape.
- If practical quarry faces should be oriented to minimise their visual impact from public areas.
- Dangerous excavations should be made safe to prevent entry of persons/stock.
- In strip exploration operations/activities, overburden material, which is adverse to plant growth, should be buried and every effort should be made to recover and store top soil from mining path for later rehabilitation.
- Heap leach operations should be designed to ensure that there is zero discharge of process fluid on surface waters or ground waters.
- Unless otherwise approved, heap leach pads should be rehabilitated after leaching by detoxification, re-contouring, re-top soiling, and re-vegetation so that they will be in stable maintenance free condition. Alternatively, the heaps could be used to backfill nearby pits.
- In general exploration activities should not be carried out closer than 30 metres from the present course of any ephemeral river. In special circumstances, where it can be demonstrated that sedimentation can be mined, provided that present riverbanks remained undisturbed.
- Mine rehabilitation should be carried out progressively to ensure that a minimum of ground is disturbed at any one time. A maximum of 2 hectares shall be un-rehabilitated at any one time unless otherwise approved.
- The mining and rehabilitation method should ensure each layer disturbed should be replaced to its original sequence at topsoil as its final layer. All disturbed areas should be progressively rehabilitated.
- Tailings and Slimes from wasting plants should be expounded in properly constructed dams unless otherwise approved.
- Air and water emissions from mining and smelters should be effectively treated before release to the environmental to ensure that they are of acceptable quality.
- All exploration drill holes should be capped, plugged/filled in, either progressively or at the end of the program.
- All drilling sites, trenches and pits should be rehabilitated (i.e., backfilled and re-vegetated) after the cessation of exploration.
- Each site should be left in a clean and tidy condition with all refuse removed.

Mine closures can be planned for and should form part of an integrated land use strategy that involves the community. The decommissioning of the exploration activities on EPL 8474 is envisaged in the future if no viable mineral resources are found. Planned closure, in consultation with the community, provides the opportunity to develop alternative land uses through rehabilitation, and to use the remaining infrastructure for other economic purposes such as livestock farming. When the event occurs some recommendations have been outlined in **Table 13.**

Table 13: Decommissioning phase management actions

Environmental Feature	Management Actions
Deconstruction activity	Many of the mitigation measures prescribed for the exploration & mine rehabilitation activities **(Table 10 & 11** above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.
Rehabilitation	In the event that decommissioning is deemed necessary, excavations need to be rehabilitated according to the management actions laid out in **Table 10 & 11** above.

4.0 CONCLUSION AND RECOMMENDATIONS

The proposed exploration activities on EPL 8474, situated at Otwani, Opuwo Rural Constituency, Kunene Region, Namibia will bring both positive and negative impacts. The exploration activities within EPL 8474 will benefit and bring about employment & development to the surrounding communities in the Epupa area. No major impacts of the project are expected during the operation phase since only the prospecting & bulk sampling of the target mineral resources will be undertaken and further processing done offsite. Minimal vegetation will be cleared from the site, the existing niche ecosystems will be greatly affected. Mine vehicles and equipment will bring noise and oil spillages, if not fitted with mufflers and drip trays. Most of the projected impacts will be significant and hence the need for a comprehensive and strict environment management plan to be implemented along the entire project life span and decommissioning phases. Management of residual impacts also need to be monitored and mitigated to offset the footprint of the exploration activities. On the basis of the above preliminary analysis and taking cognizance of the fact that the proponent has proved financially and environmentally credible, it is our recommendation that the project be allowed to continue provided the mitigation measures suggested in this EMP are strictly adhered to as deemed necessary by MEFT:DEA.

It is anticipated that the environmental management plans outlined in this report will be enforced not only as a policy obligation but to benefit Blue Spade Construction CC and the surrounding community in the Otwani Village area. It should be noted that environmental management is still a challenge to exploration/mining projects hence it is imperative for them to be always monitored by the responsible authorities so as to achieve environmental protection. It is hoped that this updated EMP report will assist Blue Spade Construction CC towards reducing the negative impacts of this project for the benefit of the next land user.

In line with the above, it is recommended that Blue Spade Construction CC embark on the following:

- Appoint a qualified mine manager in terms of Minerals (Prospecting & Mining) Act, 1992 (Act No. 33 of 1992).
- Solid Waste Disposal guidelines should be obtained for best practice at the MEFT:DEA.
- Establish all infrastructures as per a Siting of Works plan approved by the Ministry of Mines and Energy.
- Register the boreholes with Ministry of Agriculture, Water and Land Reform.
- Appoint an environmental consultant (HEEC) to perform environmental audits and prepare biannual reports about the project's progress
- Get inspection certificates from the Mining Commissioner as and when they are due
- Involve the Otwani village community and employ locals first.

The usual practice with EMPs is that they indicate how the proponent (Blue Spade Construction CC) will comply with established environmental and social standards. The set of proponents (Blue Spade Construction CC) and Counterpart EMPs (this document) will provide a good basis for addressing environmental and social issues at the exploration site (EPL 8474). However, they will not provide an adequate understanding of the impact of exploration activities on public health and ecosystem functions downstream from exploration operations/activities or provide an adequate basis for setting mitigation priorities. This will require biennial environmental compliance auditing by the consultants (HEEC) or additional work beyond the scope of the site-specific exploration operations and Counterpart EMPs, or the cumulative Environmental Assessments for the exploration activities that provided the original baseline.