

Environmental & Social Impact Assessment: The Proposed Mining activities on Mining Claims number 74555, 74556, 74557, 74558, 74559, 74560, 74561, 74562, 74563 AND 74564-Farm Florensia 69, USAKOS, ERONGO REGION-Namibia.



Environmental Scoping Report (ESR)

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Client	Pepezone Investments Enquiries: Mr. Berend van den Berg Tel: +264 85 7 679 254 E-Mail berend@globalmelters.com		
Lead Consultant	EnviroPlan Consulting Cc Enquiries: Mr. Tendai Kasinganeti Tel: +264 813634 904/ +264814087482 E-Mail: info@enviroplanconsult.com		
Date of release	07 March 2024		
Author/s	Name	Signature	Date
Scoping report	Adiel T Mudzanapabwe		22 Feb 24
EMP	Talent Nyungu		22 Feb 24
Fauna and Flora studies	Tendai E Kasinganeti		07 Mar 24
Heritage studies	Roland Muushi	-	-

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Table 1: Acronyms

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GHGs	Greenhouse Gasses
HAIA	Heritage and Archaeological Impact Assessment
ISO	International Organization for Standardization
I&APs	Interested and Affected Parties
MEFT: DEAF	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs and Forestry
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
MCs	Mining Claims
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

The **'Consultant'** – this refers to the team that is conducting the ESIA and the preparation of the EMP for the development

The **'Proponent'** – this refers to the institutions/departments that are directly involved in the implementation of the project, i.e. MAWF.

The **'Stakeholders'** – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

The **'Environment'** – this refers to the ecology, economy, society and politics.

ENVIRONMENTAL IMPACT ASSESSMENT

EnviroPlan Consulting cc has been engaged by **Pepezone Investment cc** to conduct an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the *proposed base and rare metals, dimension stone, industrial minerals and non-nuclear fuel minerals* on Farm Lorensia 69 which covers 4900 ha of land in Karibib district Usakos-Erongo region and to apply for an Environmental Clearance Certificate for the proposed activity. The mining claims will utilize approximate area of 135 ha within the same farm.

The proposed establishment triggered the application for an environmental clearance certificate.

Anticipated Environmental Impacts

- Low to medium potential environmental impacts associated with the proposed mining activities. An impact management plan has been developed to mitigate any anticipated possible impacts of the project to the environment.
- Relative or moderate social impact (positive)

Social Impact

The project is generally expected to improve the socio-economic environment of Usakos area through a major boost in business by means of integrations, employment and economic boosting. Interested and Affected Parties were notified of the project through site notices and newspaper adverts and the proof for consultation is covered in Chapter 4 of this document and Appendix C of the document.

Recommendation

It is concluded that most of the impacts identified during this Environmental Assessment can be addressed through the recommended mitigation and management actions for the proposed mineral exploration activities.

Should the recommendations included in this report and the EMP be implemented the impacts can be reduced to reasonably acceptable standards and durations. All developments could proceed provided that general mitigation measures as set out are implemented to minimum levels.

In this respect, it is recommended that the proposed mining activities receives approval and receive Environmental clearance, provided that the recommendations described above and the EMP is implemented.

ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations underpin the approach to this EIA study:

- The information received from the stakeholders, desktop surveys and baseline assessments are current and valid at the time of the study;
- A precautionary approach was adopted in instances where baseline information was insufficient or unavailable;
- A regulated timeframe will apply to the review and decision making after the submission of the reports to the competent authority and other government departments; and
- Pepezone Investments mining claims have been registered for the proposed site at the onset and registration of the study under Mining Claims (MCs) number **74555, 74556, 74557, 74558, 74559, 74560, 74561, 74562, 74563 and 74564.**

NB: *The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process. All data from unpublished research utilised for the purpose of this project is valid and accurate. The scope of this investigation is limited to assessing the potential biophysical, social and cultural impacts associated with the proposed project.*

1. CHAPTER ONE: BACKGROUND

1.1. Overview

The proponent, **Pepezone Investment** has identified the economic potential of mineral deposits found in the Erongo Region. The proponent is a holder of mining claims licenses MCs 74555-74564 covering the area of 135 of 4 900 ha Farm Lorensia, Usakos. The area covering the MCs falls within a private farm land belonging to M and J /Khuwiseb. In this respect, the farm owner and the proponent will reach an operating agreement in form of Memorandum of Understanding (MoU) and access agreement for the mining activities.

As per the requirements of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007 and the Environmental Impact Assessment Regulations of 2012), an EIA is required to obtain an Environmental Clearance Certificate from the Ministry of Environment and Tourism (MET) before the project can proceed. This is because under the 2012 Environmental Impact Assessment (EIA) Regulations of the Environmental Management Act (EMA) No. 7 of 2007, mining is a listed activity that may not be undertaken without an Environmental Clearance Certificate (ECC). This activity is listed under the following relevant sections:

Table 2: Listed Activities- Environmental Management Act No. 7 of 2007

ACTIVITY	RELEVANT SECTIONS
MINING AND QUARRYING ACTIVITIES	<ul style="list-style-type: none"> - 3.1 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. -3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not. -3.3 Resource extraction, manipulation, conservation and related activities. -3.5 The extraction of a pit

1.2. The Environmental Consultant

Pepezone Investment has appointed EnviroPlan Consulting cc as the appointed Environmental Consultant to conduct an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the undertaking of the mining activities and to apply for an Environmental Clearance Certificate from MEFT through the directorate of Environmental Affairs.

1.3. Project Location

MCs 74555-74564 block is located in western Namibia, Erongo Region approximately 20 km from Usakos. Figure 1 below and 2 (overleaf) shows the locality and the farm boundaries maps.

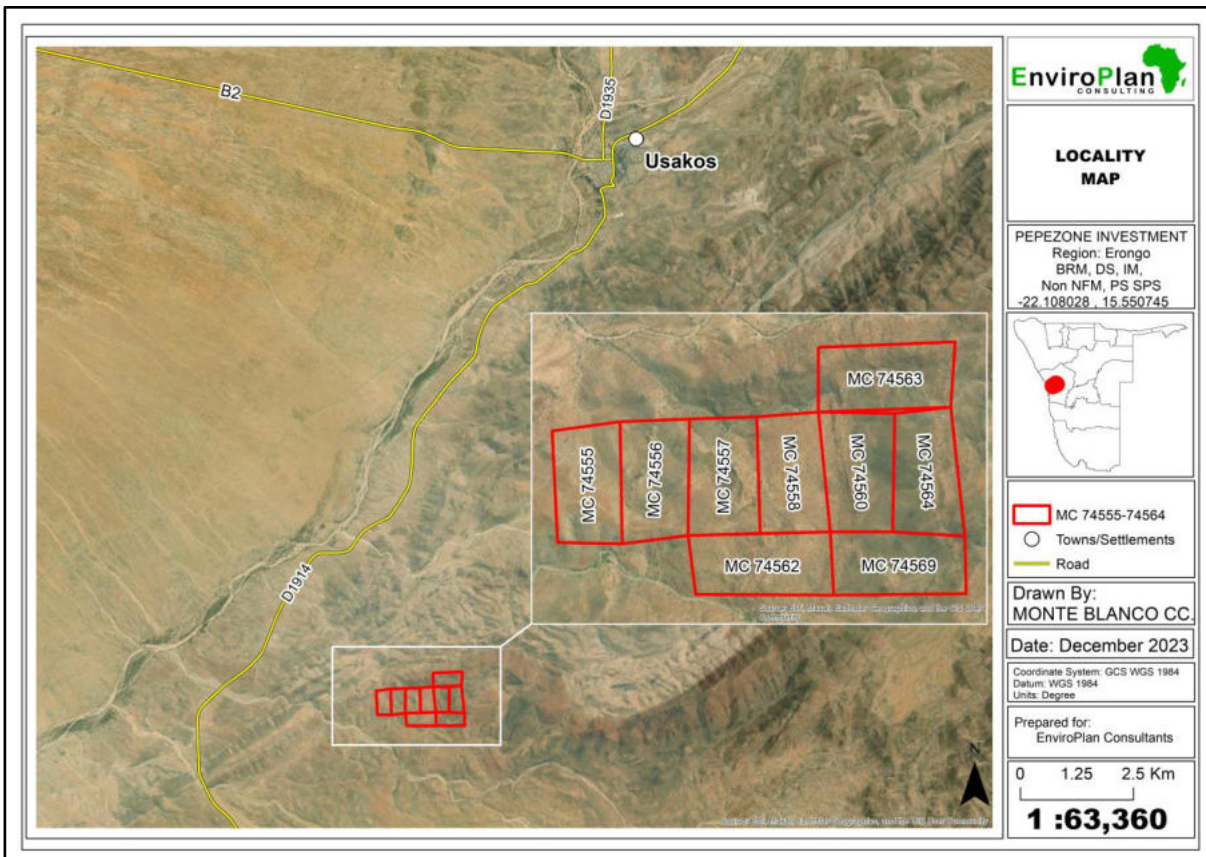


Figure 1: Mining claims locality

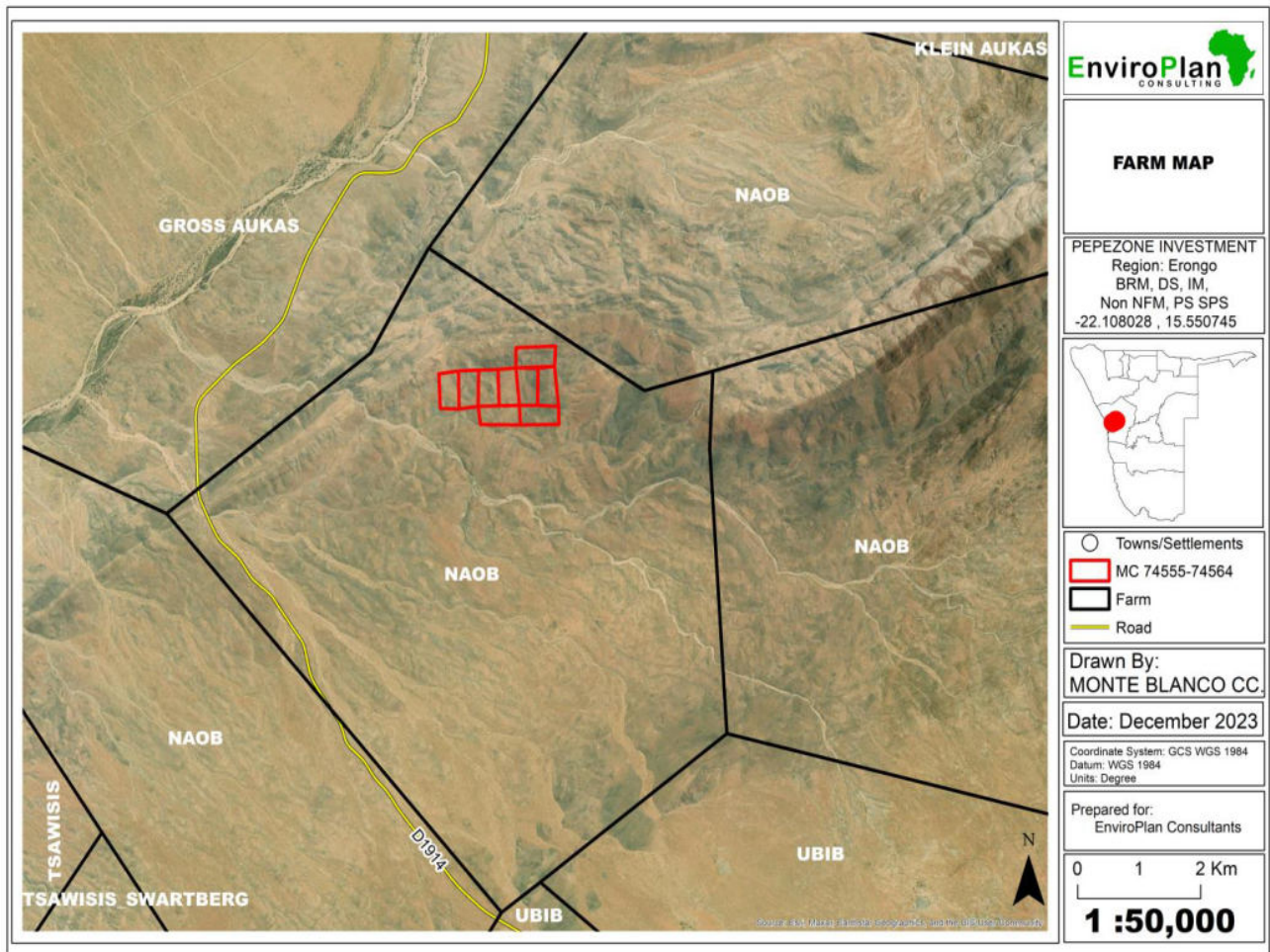


Figure 2: Farm Map

1.4. Need and Desirability of the Project

Namibia’s economic model continues to be influenced by the exploitation of mineral resources. According to the National Planning Commission Report (2021), the average contribution of the mining sector to GDP between 1990 and 2018 is significant and favourably stand at 11.1 %. Mining remains the largest earner of Namibia’s foreign exchange at about 45%. Mineral prospecting is enshrined in National Development Plan (NDP V), Vision 2030. The Harambee Prosperity Plan II plan (Pillar 2) place emphasis on economic advancement with view to enhance the productivity of priority sectors such as mining. The project inherently promotes economic socio- advancement through employment creation. The 2018 Labour Force Survey 2018 indicates that mining employs 1.7% of the total employed persons (NSA, 2019). Mining activities is thus encouraged so that the sector can contribute more to the Namibian economy (NPC, 2021).

Erongo Region despite mining activities, it still ranks low and falls within the category of least of developed administrative regions in Namibia. The proposed project presents an interesting prospect for expanding mining opportunities in the region. Living conditions are expected to increase through economic spinoffs/investments. Equally the proposed development can have an impact on direct and induced employment realized through the supply chain, and provision of support services. Direct and

indirect jobs will manifest due to the out-sourcing of short-term services (maintenance, transportation) to sub-contractors. Highly skilled workforce may be sourced from the broader region. The positive impact of job creation is considered to be of high significance due to the high unemployment prevalence rate amongst unskilled or semi-skilled population group of the Region.

Namibia has numerous deposits of good quality dimension stone displaying a variety of attractive colors, patterns and textures. The main rock types quarried are marble, granite, dolerite, conglomerate, and sodalite.

1.5. Scope of Work

This study was carried out in accordance with the Environmental Management Act (EMA) (7 of 2007) and its 2012 EIA Regulations (GG No. 4878 GN No. 30). After submitting an application for ECC to the DEA, the first stage in the EA process is to submit a scoping report. This report provides the following:

Table 3: Sections within the scoping report

Description	Section of the Report
The need and desirability of the proposed project	Sub-Chapter 1.4
Project description	Chapter 1
Alternatives considered for the proposed project in terms of no- go option, design, and natural resources	Chapter 1
The relevant laws and guidelines pertaining to the proposed project	Chapter 2
Baseline environment in which the proposed activity will be undertaken	Chapter 3
The public consultation process followed (as described in Regulation 7 of the EMA Act) whereby interested and affected parties (I&APs) and relevant authorities are identified, informed of the proposed activity and provided with a reasonable opportunity to give their concerns and opinions on the project	Chapter 4
The identification of potential impacts, impacts description, assessment, mitigation measures and recommendations	Chapter 5
Recommendations and conclusions to the report	Chapter 6

1.6. Project phases

Proposed mining activities comprise various phases. For this EIA, the phase-based activities were categorized to enable impact assessment and analysis. The different project sections are as follows:

1.6.1. Construction Phase (Site Preparation)

Access agreements will guide the working relationship between landowners and mining team. The mining team will undertake initial site visits to identify appropriate sites for the establishment of field camps. The field camps are for the safe keep of mining equipment and vehicles before use. No employees will be housed in the MCs. Site preparation activities will begin once surface drainage and ground water conditions are understood. Mining will only commence after ecological sensitive areas are known and agreed jointly with landowners.

Land clearing: Small land parcels will be cleared for the establishment of base or field camps and staging areas. Proponent shall ensure that areas identified are those that present minimal disturbance to the natural environment and wildlife.

Creation of access routes and haul tracks: Apart from the existing farm roads network leading to target areas, additional tracks (extensions from farm roads) may be created. Additional roadways may be considered for the purposes of accessing target sites. Where deemed necessary, graveling, and compaction of vehicle track's surfaces may be considered to allow for less track maintenance and seam less flow of traffic. No roads of bitumen standard exist in the farm area. No permanent structures will be built for mining works.

Fencing: Where deemed feasible, fences will be erected around field camps and target areas. Fencing will serve to keep out livestock from target sites.

1.6.2. Operational Phase

The phase typifies an advance level of mining. Minerals extraction methods: quarrying, diamond wire cutting, chain saw cutting and flame cutting.

The following mining methods will be considered:

Quarrying: Dimension Stone is produced from quarrying. Quarry operations typically involve isolating a mass of stone by cutting it free from the parent mass on all sides but one. The isolated mass is then lifted or separated from the parent mass by breaking it free or by undercutting it with a wire or chain saw. The extraction of dimension stones using primitive techniques entails the process of obtaining large blocks or slabs of natural stone from quarries through methods predating modern machinery and technology. These methods have been historically employed by ancient civilizations and traditional stone workers across different regions.

During ancient times, some techniques involved the use of fire or hot water to heat the stone, followed by rapid cooling using cold water or air. This thermal shock induced cracks and fractures along the stone's natural weak points. Manual excavation using hand tools, such as chisels, picks, and

hammers, was a labour-intensive process that involved removing overburden and cutting through rock layers. Presently, dimension stone extraction predominantly relies on advanced machinery and cutting-edge technologies, enabling improved productivity and accuracy. Nonetheless, traditional methods continue to hold cultural significance, preserving ancient techniques and catering to specialized projects that prioritize the artisanal aspects of stone craftsmanship. It is essential to acknowledge that these primitive techniques are rarely employed in modern quarrying operations. Instead, the industry heavily relies on state-of-the-art machinery and tools, such as diamond wire saws, channelling machines, hydraulic splitters, and chemically induced fracturing methods, ensuring the efficient and precise extraction of dimension stones.

Diamond Wire Cutting: It is a highly mechanized method employed for the extraction of natural stones. This technique utilizes a steel wire embedded with diamond-engraved bits, which is tensioned and continuously moved by a specialized machine. These indispensable machines play a crucial role in various stages of dimension stone extraction, ranging from block production to the creation of final products. The diamond wire cutting method has evolved in response to evolving consumer demands, (Karandagoda 2023).

Chain saw cutting: Compared with the splitting method, the sawing method is of higher degree of mechanization, lower labour intensity, higher labour efficiency, higher rough stone block rate, better safety, lighter environmental pollution and higher utilization rate of resources. It is the main method of soft dimension stone mining. Soft stone is low in hardness and low in wear-resistance, most kinds of soft stone have relatively poor splitting. They are more suitable for using sawing method

Flame cutting: Flame cutting method is only used in granite mines for mining trench excavation operations also due to higher cost. Especially with the development of diamond bead saws, mining belt saws, chain-arm saws and mining disc saws, they have more and more excellent mechanical performance, their manufacturing and maintenance cost is getting lower and lower, soft stone sawing method mining shows great advantages

Site Rehabilitation: Dug out trenches will be back filled with waste rock (gangue). Stockpiled top soil will be returned to the backfilled areas. Sites will also be re-vegetated and returned to a pre-exploration state. Rehabilitation will be done concurrently with mining activities (ore removal etc).

Water requirements: Water will be sourced from existing boreholes. About 80,000 litres (80 m³) per day would be required. This amount of water is aimed at suppressing dust around tipping areas and vehicle tracks. Approximately 400 *liters* of domestic water will be needed per day.

Waste management: Waste material generated will be in the form of rock material (non-mineral) and derived from trenching activities. Insignificant amounts of domestic waste will be generated by the mining team. Domestic or general waste will be transported out of the MCs area on a daily basis and disposed at an approved land fill site in Usakos town. There are no licenced waste disposal sites in the project area.

Efluent Management: During mining, sufficient portable chemical toilets will be provided for workers and appropriately emptied according to their manufacturer's operational standards and legislated occupational sanitary provisions. Licenced waste contractors will provide sewage removal services.

Mining equipment, Materials and Services:

Construction equipment will be sourced from contractors proximate to the project site. Were deemed essential, equipment will need to be sourced from elsewhere in the country and/or abroad as per the required and approved operating standards.

Labour sourcing: Temporary or contract employment opportunities will be created during the duration of mining activities.

Housing: Personnel will be accommodated at an identified mining camp area. Before use of a camp, an environmental risk assessment will be conducted and submitted together with the biannual report of the mining activities.

1.6.3. Decommissioning/Closure Phase

This phase will involve the removal of equipment and dismantling of facilities and safe mining closure. All trenches will be backfilled. The mining timeframe/ period will be determined by the viability of the existing mineral deposits within the claims. The surface affected by mining will be rehabilitated and re-vegetated in accordance with applicable standards. Decommissioning will be done following a detailed study which will guide decommissioning activities to be compliant to the EMA Act of 2007 and its guidelines and regulations.

1.6.4. Environmentally sensitive areas identified

The proposed mining activities are not in any sensitive protected areas such as community forests, conservancies, and areas with memorial sites. A Specialist Heritage and Archaeological impact Assessment was commissioned for the project area and here attached as Appendix.

1.7. Project alternatives considered

Alternatives are defined as: "different means of meeting the general purpose and requirements of the activity" (Environmental Management Act (2007) of Namibia and its regulations (2012)). This section will highlight the different ways in which the project can be undertaken and identify the alternative that will be the most practical but least damaging to the environment.

1.7.1. No-Go Alternative

The "No-Go" alternative is the option of not proceeding with the activity, which typically implies a continuation of the status quo. This would mean that the mining activities will not be done, and potential mining opportunities will be lost. The local economy will not be improved.

In considering the proposed project, the 'no-go' option cannot be the preferred alternative.

1.7.2. Resources alternatives

In terms of the resources that may be required for the proposed mining activities, their alternatives are presented in Table 4 overleaf.

Table 4: Alternatives considered in terms of services infrastructure

Services	Proposed source	Alternative source
Water	Water to be sourced from existing boreholes.	Piping water from other sources out of the project area. This would be done to supplement local water supplies
Power	Electric energies and generators	Solar
Power for cooking	Gas stoves	Solar
Worker's accommodation	Campsite at the project site	Accommodation in the nearest town, which is Usakos (depending on commuting and accessibility)
Mining technology	Identified targeted points within the mining Claims	Quarrying Diamond Wire cutting Chainsaw cutting Flame cutting
Waste Management		
Sewage	Portable toilets – these are easily transportable and have no direct impact on the environment or ecology (if waste is properly disposed of)	Ventilated improved pit (VIP) latrine.
Domestic waste	Onsite waste bins, regularly emptied at the nearest landfill (Usakos landfill site)	Driving waste daily to the nearest town landfill (Usakos municipality landfill site)
Hazardous waste (chemicals)	Waste generated is to be transported to and disposed of at an appropriate facility in the nearest town (Usakos) equipped for the disposal of hazardous waste	None

1.7.3. Conclusions on the Considered Alternatives

The alternatives considered for the project are summarized as follow:

- No-go visa vies continuation of the proposed project: The no-go alternative is not considered to be the preferred option. Should the proposed project be discontinued, none of the potential impacts (positive and negative) identified would occur. Therefore, the underlying mineral deposits will remain untapped.

- Project design: The proposed mining methodology will be informed by this ESIA study to ensure minimal impacts on the receiving environment.
- Resources:
 - Water-Water for the proposed activity is to be sourced from boreholes.
 - Energy- Increased use of solar technologies is promoted within the development. Where it cannot be successfully employed the use of generators would be required.
 - Waste - Domestic and hazardous waste is to be disposed of appropriately. Portable toilets are to be made available at the construction site and the mining camp and these are easily transportable and have no direct impact on the environment or area ecology (if waste is properly disposed of).

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Introduction

To ensure that the proposed development comply with the legal requirements for good practice and preservation of the environment, a review of applicable Namibian and international legislation, policies and guidelines have been consulted. This review serves to inform the project Proponent, Interested and Affected Parties and the decision makers at the DEA of the requirements and expectations, as laid out in terms of these instruments.

The project triggers the following Namibian legal instruments.

- *The Constitution of the Republic of Namibia (1990).*
- *Environmental Assessment Policy of Namibia 1994.*
- *Environmental Management Act No. 07 of 2007.*
- *EIA Regulations GN 57/2007 (GG 3812).*
- *The Water Act 54 of 1956.*
- *The Water Resources Management Act No. 11 of 2013.*
- *Pollution Control and Waste Management Bill.*
- *Atmospheric Pollution Prevention Ordinance 11 of 1976.*
- *National Solid Waste Management Strategy.*
- *Soil Conservation Act 76 of 1969.*
- *Road Traffic and Transport Act, No. 22 of 1999.*
- *Forest Act 12 of 2001.*
- *Mineral Policy of Namibia*
- *National Policy on Climate Change for Namibia (2011).*
- *National Climate Change Strategy & Action Plan 2013 – 2020.*
- *Nature Conservation Ordinance (1996).*
- *National Biodiversity Strategy and Action Plan (NBSAP2) 2013 – 2022.*
- *Labor Act 11 of 2007.*
- *Health and Safety Regulations GN 156/1997 (GG 1617).*
- *Public Health Act 36 of 1919.*
- *Public and Environmental Health Act 1 of 2015; and*
- *National Heritage Act 27 of 2004.*

These above-listed legislations and policies and their inclusion in the proposed project assessment are further presented in Table 5 overleaf

Table 5: Polices, legal and administrative regulations

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95 (i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the Sustainable objectives which include: Guarding against overutilization of biological natural resources, Limiting over-exploitation of non-renewable resources, Ensuring ecosystem functionality, Maintain biological diversity.	Mining activities can interfere with ecological processes. Attention should be given to the state of water resources and biodiversity
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia states Schedule 1: Screening list of policies/ plans/ programmes/ projects subject to environment must be accompanied by environmental assessments. "The development activities" are on that list.	The activity triggers an environmental impact assessment prior to commencement
	The policy provides a definition to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical, and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes, and plans.	The proposed development requires the assessment of all possible environmental and social impacts to avoid, minimise or compensate environmental damage associated with the activities.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Environmental Management Act No. 07 of 2007	<p>Requires that activities with significant environmental impact are subject to an environmental assessment process (Section 27). Requires for adequate public participation during the environmental assessment process stakeholders to give their opinions about a project (Section 2(b-c)). According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Section 3 (2) (b) states that “community involvement in natural resources management and the sharing of benefits arising from the use of the resources, must be promoted and facilitated” is key. Section 3 (2) (e) states that “assessments must be undertaken for activities which may have a significant effect on the environment or the use of natural resources”.</p>	<p>The nature of the proposed mining and interrelated activities has potential to cause adverse environmental impacts to the surrounding environment. Activities such as trenching can cause significant environmental impacts. Therefore, proper assessments should guide project planning The EIA study considered full stakeholder participation. Stakeholder consultation was fully conducted.</p> <p>The proposed development is involving the utilisation of natural resources (water and land). Therefore, benefits from the implementation of the project must be shared equally. Environmental cost relating to project shall not be borne by communities found in the project area and surroundings. Project shall not commence without an environmental clearance certificate</p>
EIA Regulations GN 57/2007 (GG 3812)	<p>Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). Details the requirements for what should be included in an Environmental Scoping Report (GN No 30 S8) and an EIA report (GN No 30 S15).</p>	<p>The implementation of the project triggers the need for consultation of all affected and interested stakeholders regarding the development at all project development phases from planning to operation of the facility. A stakeholder and I&APs consultation meeting were held in respect to this, and all the concerns and issues were noted and addressed in this report.</p>
The Water Act 54 of 1956	<p>The Act was formulated to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban, and</p>	<p>The activities directly affecting water conservation, management and use therefore, requires the implementation of water conservation measures.</p>

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	industrial purposes; to make provision for the control, in certain respects, of the use of sea water for certain purposes; for the control of certain activities on or in water in certain areas.	
Minerals (Prospecting and Mining) Act, 1992 (Act no. 33 of 1992)	Act provides the licensing procedures, the rights of holders, the administration, and the ownership of minerals. In addition, the Act requires mining companies to provide detailed studies on the potential impact of the operations to the surrounding environment, how to mitigate them and rehabilitations plans	Prospecting or mining operations shall not commence except in accordance with license granted. Renewals of MCs are accommodated twice for two-year periods, with the area decreasing by 25 per cent with each renewal
Pollution Control and Waste Management Bill	The bill aims to “prevent and regulate the discharge of pollutants to the air, water and land” Of particular reference to the Project is: Section 21 “(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse.” Section 55 “(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment.”	The proposed activity triggers Section 21 and 22 of the bill. Activities such as trenching transportation, primary crushing may require the robust adoption of in-situ pollution mitigation measures. Contractors of the civil works of the project should make it mandatory that they manage their waste in a manner that do not cause environmental harm and risk both to the surroundings and the local communities.
Atmospheric Pollution Prevention Ordinance 11 of 1976	The law provides for the prevention of atmospheric pollution and for matters incidental thereto. The law regulates and prohibit pollution from industries particularly smoke and dust. The ordinance	Mining activities will most likely affect ambient air quality. Efforts to suppress and monitor dust should be adopted as recommended in the EMP.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	<p>considers air pollution from point sources but does not address air quality standards,</p>	
<p>National Solid Waste Management Strategy</p>	<p>The Strategy ensures that the future directions, regulations, funding, and action plans to improve solid waste management are properly co-ordinated and consistent with national policy, and to facilitate co-operation between stakeholders.</p> <p>Waste disposal presents a challenge to solid waste management in Namibia. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.</p>	<p>Mining activities can potentially generate significant amount of waste material that need careful management. The obligation to meet waste management objectives should be borne by both proponent and contractors.</p> <p>The proponent should limit the exposure of waste to the natural environment and surrounding.</p> <p>In-situ waste management plans should be adopted and implemented prior the commencement of operations.</p> <p>Rock waste and other non-mineral waste should be stored and disposed in an environmentally friendly manner. Waste should be carted away to licences waste disposal sites.</p>
<p>Soil Conservation Act 76 of 1969</p>	<p>The Act established to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement, and manner of use of the soil and vegetation and the protection of the water sources in the Republic of Namibia.</p>	<p>The construction of auxiliary infrastructure such as access roads or tracks to mining targets should include systems and mechanism for preventing erosion.</p>

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.	Mitigation measures should be provided for if the roads and traffic impacts cannot be avoided. Should the proponent wish to undertake activities involving road transportation or creation new access adjoining national roads, relevant permits will be required from the Ministry of Works and Transport
Forest Act 12 of 2001	Section 10 (1) set out the aim of the forest management as to: The purpose for which forest resources are managed and developed, including the planting of trees where necessary in Namibia is to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment.	The proposed project will likely result in the disturbance of indigenous vegetation of conservation significance including the disruption of biological processes.
	(b) any living tree, bush or shrub growing within 100 metres of a river, stream, or watercourse.	The project will not result in the removal of living trees, bushes and shrubs growing within 100m of a river, stream, or watercourse.
	(2) A person who wishes to obtain a licence to cut and remove the vegetation referred to in subsection (1) shall, in the prescribed form and manner, apply for the licence to a licensing officer who has been designated or appointed for the area where the protected area is situated.	The removal of trees in the above instances would require the contractors or sub-contractors to acquire necessary forestry permits first.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
National Policy on Climate Change for Namibia (2011)	The National Policy on Climate Change pursues constitutional obligations of the Government of the Republic of Namibia, namely for “the state to promote the welfare of its people and protection of Namibia’s environment for both present and future generation.”	Measure should be adopted by NHIG to prevent or minimise toxic emissions into the atmosphere. Dust suppression and monitoring will be employed, to ensure those air quality objectives tied to climate change mitigation are met.
National Climate Change Strategy & Action Plan 2013 – 2020	The Strategy outlines Namibia’s response to climate change. The strategy aims to address and plan for action against climate change, both through mitigation and adaptation actions. In its adaptation strategy, the Strategy recognises the role of a sustainable water resource base.	The development should adopt measures that strengthen sustainable utilization of water resource. The implementation should be very careful on not to cause harm to the available water resources but improve the management through various conservation technics.
	The Strategy proposed strategies that aim to: Strategic Aim 1: Further improve the overall climate change understanding and related policy responses in water resources sector. Strategic Aim 2: Monitoring and data collecting technologies of surface and underground water are developed and implemented at basin/watershed level.	The proponent should invest capital on strengthening climate change and adaptation through cleaner production systems implementation. Certification by international standards such as ISO14001 can help with climate sustainability, and is recommended.
Nature Conservation Ordinance (1996)	This ordinance relates to the conservation of nature; the establishment of game, parks, and nature reserves; the control of problem animals; and highlights matters incidental thereto.	The activities of the project are highly localized. The likelihood of project activities interference with any protected parks and nature reserves objectives is non-existent. However, there is need for proper designing and planning of the drainage and water network of the project to make sure that any service infrastructure is not in conflict with the provisions listed in the Nature Conservation Ordinance.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
		All species of birds are protected except the game birds mentioned in <i>Schedule 6</i> which can be hunted.
National Biodiversity Strategy and Action Plan (NBSAP2) 2013 – 2022	The action plan was operationalized in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.	The proposed project during construction and operation phases potentially triggers ecosystem threats from pollution. As such mechanisms for environmental compliance and monitoring will be put in place, ultimately aimed at protecting biodiversity.
Labour Act 11 of 2007.	Empowers the minister responsible for labour to publish regulations pertaining to health and safety of labourers (S135). Details requirements regarding minimum wage and working conditions (S39-47).	Proposed mining activities invite significant amount of laborious work. Therefore, there is need to ensure that proponent ensures employees a working environment that is safe, and adequate facilities provided for the upkeep of employee welfare standards. The Ministry of Labour and Safety demands that a health management policy will be drafted and instituted.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety requirements.	-Occupational health and safety provisions during construction and operational phases should be clearly outlined. -Compliance monitoring and responsibilities for compliance monitoring should be clearly stated
Public Health Act 36 of 1919	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	Compliance to the Public Health Act will be ensured in relation to the following: - Sanitation facilities -Communicable diseases -Emergency healthcare provision
Public and Environmental Health Act 1 of 2015.	To provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.	- COVID 19 workplace measures

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
National Heritage Act 27 of 2004	<p>Section 48(1) states that “A person may apply to the (Heritage) Council for a permit to carry out works or activities in relation to a protected place or protected object”</p> <p>Protects and conserves cultural heritage and cultural resources with special emphasis on places and sources of National heritage including graves, artefacts, and any objects older than 50 years.</p>	<p>The project impacts are localized and there are no heritage or cultural artefacts relating to project area. However, if heritage resources (e.g., human remains etc.) discovered during implementation, guidelines dictate that a permit be acquired from the National Heritage Council of Namibia for relocation of any artefacts or specimen.</p>
SANS 1929: 2005	<p>Dust particulates from excavations /ore crushing that are smaller than 1mm are deemed dangerous to both plants and humans. As such a dust monitoring following the ASTM D1739 method should be used for monitoring dust emissions from any crushing plant anticipated.</p> <p>Dust chemical analysis and fallout quantities are specified for industrial and residential environs.</p>	<p>A dust fallout monitoring plan can be instituted around project area</p>

3. CHAPTER THREE: ENVIRONMENTAL AND SOCIAL BASELINE

3.1. Introduction

In this chapter, the findings of the EIA team on baseline surveys, public consultation and desk reviews undertaken are in respect to the ecology, society, economy and geo-political set up of the proposed project area. The geological structure and meteorology of the project site will also be discussed in this chapter to give an in-depth understanding of the project area in question. The mining claims are located within the Karibib district, Erongo Region at a private Farm Lorensia 69.

3.2. Socio-economic profile

Usakos is riddled with poverty and alcohol abuse and the unemployment rate, as of 2012, was around 60%. Unlike other Namibian towns, it has not seen substantial development since independence in 1990, Ihuhua et al (2012).

Usakos population is also growing and the current population figure is close to 9,000 inhabitants. Mining activities in the locality of Usakos are on the rise and a large solar plant project has just been launched, 45 Km outside Usakos. There is also a notable increase in potential business clients who seek to negotiate land for business development in and around Usakos. Some are viable with regard to job creation, while others are not. Any business development should be geared towards job creation, mainly for the town's people.

Usakos has been bleeding economically for over 50 years, going back to the early 70's when Rossing Uranium was not accommodated, the closure of the Railway activities in Usakos, and the collapse of the Karakul farming industry. The tables should be turned now, and development and industries should be sought out and embraced to uplift our beautiful town and our economy. Over 3,000 passenger cars and trucks are passing through Usakos daily and the focus should be to attract these travellers to stop and do business in Usakos.

3.2.1. Land Use

The existing claim numbers 74555-74564 are located on a private owned modern farm Lorensia 69. The farm activities include cattle rearing, goat farming, poultry and existence of wildlife living in the area like mountain zebras, kudus, springboks and steenboks. In 2024 cattle were notably being relocated from the farm due to drought. Neighbouring farm Achab has chalets accommodating visitors from all walks of life.

3.3. Climate

3.3.1. Precipitation

Based on the regional data, the average annual rainfall of the area is between 200 – 300 mm. This wide rainfall variability typifies the rainfall patterns in the west central parts of Namibia. Mean annual gross evaporation ranges between 3200 – 3400 mm.

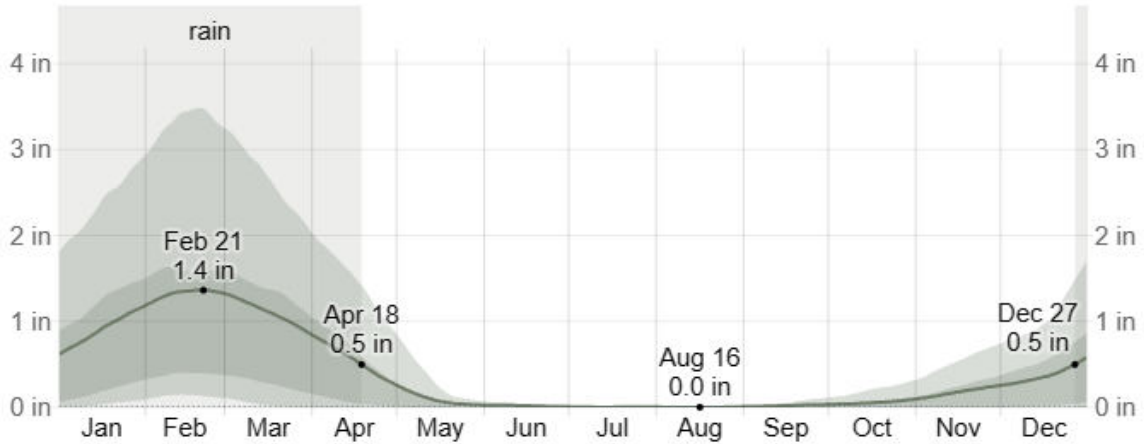


Figure 3: Average Monthly rainfall in Usakos, [@ WeatherSpark.com](https://www.weather-spark.com)

3.3.2. Temperature

The area has a desert climate prevailing. The daytime temperature is warm to hot, while it can also be cold at night. The average annual temperature is 26° degrees. It is dry for 265 days a year with an average humidity of 35% and an UV-index of 5. The general local project area has the following three temperatures related seasons:

- A dry and relatively cool season from April to August with average daytime highs of 23°C and virtually no rainfall during this period;
- A hot and dry season from September to December with minimal and variable rainfall falling (<20mm per month) and average daytime highs of 30°C, which regularly exceed 40°C, and;
- A hot and dry season from September to December with minimal and variable rainfall falling (50mm per month falling during this period (although this is extremely variable) and average high temperatures of 29°C.

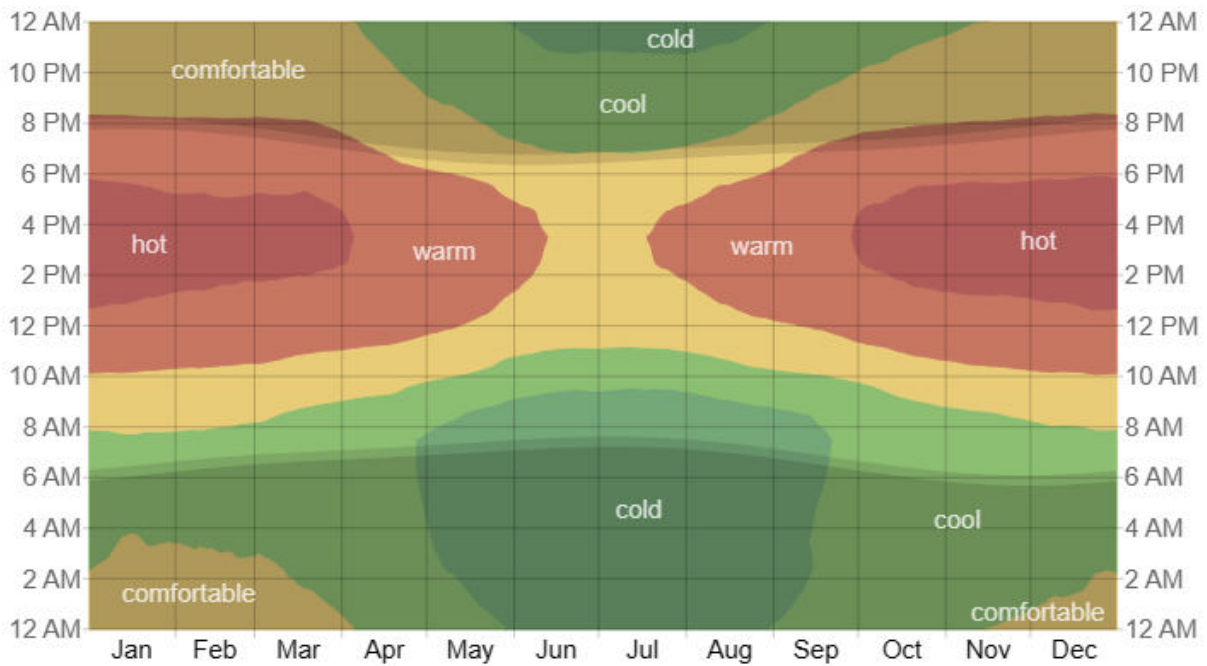


Figure 4: Average hourly temperature in Usakos, @ WeatherSpark.com

3.3.1. Wind Patterns

The prevailing winds in the general area, seems to be dominated by winds from the east, south eastern and southwest quadrants. Locally, the situation may be different due various influences including topographic surroundings effects and structures. Seasonal variations in the wind fields are presented by the regional average wind data for January, April, July and October. An increase in the north to north-easterly winds during summer (January) and autumn (April) is likely. Winter months may be characterised by the highest frequency of these north-eastern winds.

Generally, the southerly and south-westerly winds that are prevalent in this part of Namibia and may reach a maximum speed of 30.6 m/s particularly during the dry summer periods. During the rainy season, winds are much more variable, typically with low average velocities. Low clouds and dust storms sometimes affect the visibility but the influence is limited to fewer than five hours or even minute.

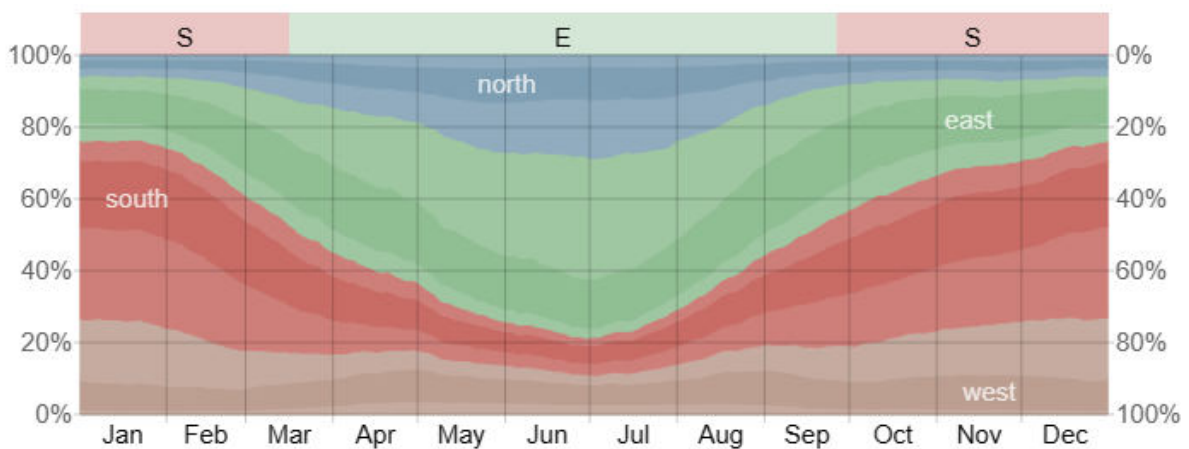


Figure 5: Wind directions in Usakos, @ WeatherSpark.com

3.4. Flora

The likely temporal and long-term impacts and influences of the proposed project will largely be localized and will depend on the susceptibility of the local flora and fauna. Such local condition will include the type, density and conservation status of the concerned species with respect to actual project sites likely to be affected. Generally, plant species are sources of food and shelter to a variety of birds and animals. The size of the habitat area that might be impacted and the conservation status of affected species are important in the assessment process. The local area is pristine and it's suited on the outskirts of Usakos.

Soils on the study area are shallow, containing pebbles and depositions. There are deposits in the gorges and in the lee of mountains, while colluvium has been deposited at the base of hills and mountains. Alluvial, silty sands and gravel are deposited in the drainage lines. The vegetation study area is characterized by sparsely scattered dwarf shrubs and ephemeral grasslands on the plains, undulating hills and mountains and sparse riparian woodland along the river.

In summary, *Vachelia reficiens* (red umbrella thorn) and *Boscia foetida* are the dominant perennial plant species on the plains. While *Commiphora glaucescens* and *Boscia foetida* are characteristic perennial plants on hillsides. The trees, *Faidherbia albida*, and *Acacia reficiens* (red umbrella thorn) are common in drainage lines.

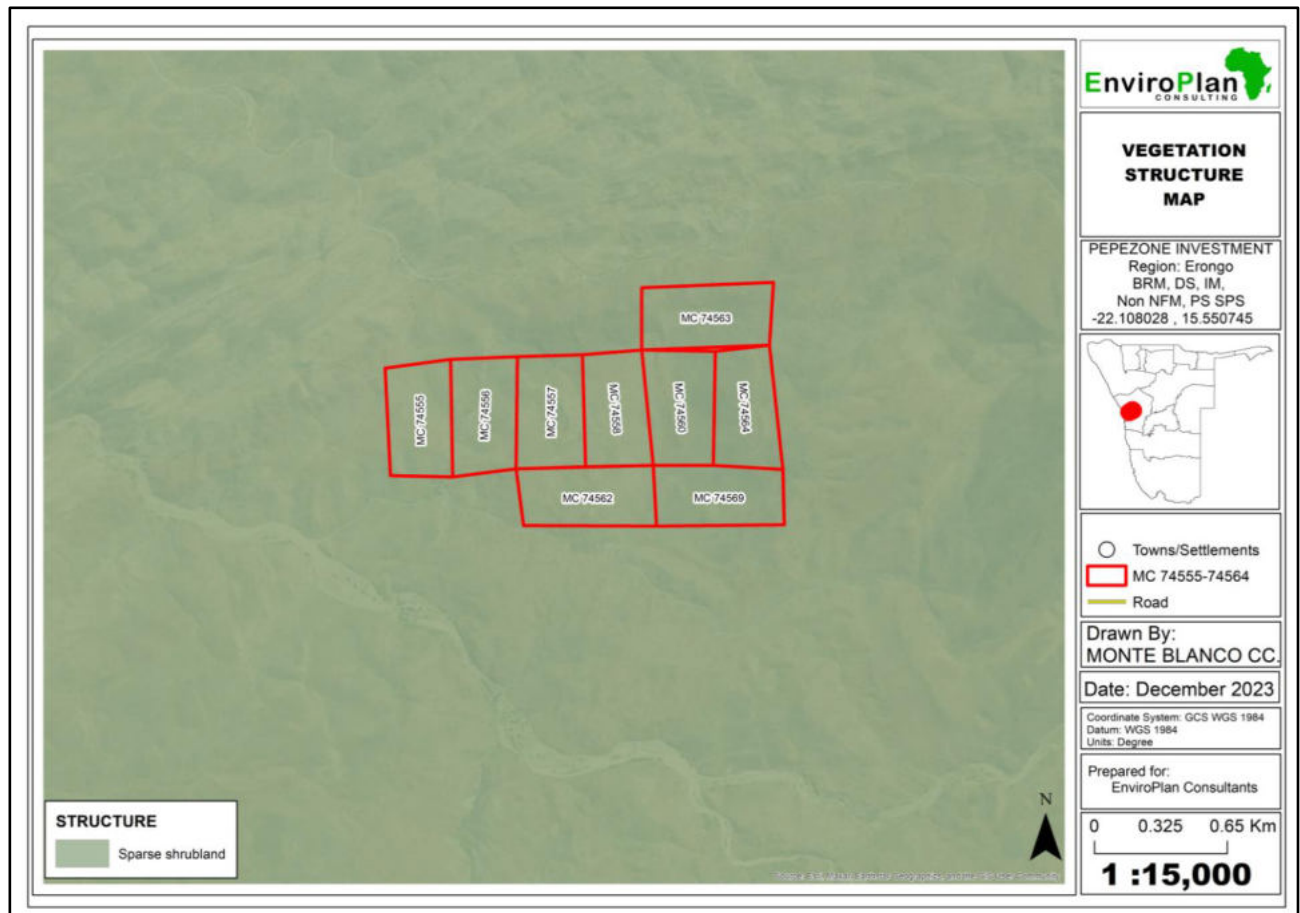


Figure 6: Vegetation Structure Map

3.4.1. Habitat categorization

There mining claims will have direct impacts on one farm (farm Lourensia.) From the farm, a total of four plant-based habitats were visited for plant identification. The habitat types in the farm areas were:

1. Rocky hillside with loose surface rocks and no soil or soil that is very shallow
2. Open plains with deeper soil and scattered bushes and shrubs. The plains are interrupted with rocky outcrops of varying sizes. It relatively consists of the least vegetation or least species richness.
3. Watercourses that are normally dry but that carry water for very short periods during the rainy season. The watercourses are marked by having more bushes and scattered trees along their length, and the substrate is usually sandy and un-compacted.

The proposed activities will impact the following:

1. Farm Lourensia 69
 - a) Rocky hills
 - b) Plain

Each of these habitats has its own distinctive food, shelter and refuge characteristics, but each with similar faunal characteristics. Compared to rocky hillsides and watercourse habitats, open plains are more widespread and more homogeneous. Therefore, avoidable disturbance in any of the area should be minimized, since they all support taxa of high priority especially Rockyhills and Watercourse.

A detailed Flora and Fauna study is also attached in Appendix (B) of the ESR.

3.5. Fauna

Farm Lourensia 69 is already affected by klan sub-station operational activities as well as general farm activities within the project area. The general area has limited occurrence of wildlife due to the aridity of the project area. Animals said to be occurring predominantly within the project area are springbok, eland, kudu, zebra and small animals such as rabbits and squirrels. No wildlife was observed during the baseline assessment of the project area. Domestic animals such as cattle, sheep and goats are domesticated at Farm Namibfontein for farm subsistence. In general, the proposed project will not have any detrimental and irreversible effect on the general fauna carrying capacity of the project area.

3.5.1. Amphibians Diversity

Of the seven species of amphibians that potentially could occur in the general area, two (2) species are endemic (*Poyntonophrynus hoeschi* and *Phrynomantis annectens*) (Griffin 1998b) and one (1) species is classified as “near threatened” (*Pyxicephalus adspersus*) (Du Preez and Carruthers 2009) – i.e. high level (42.9%) of amphibians of conservation value from the general area. *Pyxicephalus adspersus* is also more common in northern Namibia where it faces severe anthropomorphic pressure (Griffin pers. com).

With the exception of these important species and due to the fact that there is no open permanent surface water in the general area, amphibians are not viewed as very important in the dry western part of Namibia.

3.5.2. Mammals Diversity

Of the at least eighty-eight (88) species of mammals known and/or expected to occur in the general Karibib/Usakos/Omaruru areas, ten (10) species (11.4%) as endemic while the Namibian legislation further classifies five (5) species as vulnerable, two (2) species as rare, three (3) species as specially protected game, nine (9) species as protected game and five (5) species as insufficiently known.

The most important species from the general area are probably those classified as rare (e.g. *Cistugo seabrai* & *Atelerix frontalis angolae*) and vulnerable (e.g. *Galago moholi*, *Proteles cristatus*, *Hyaena brunnea*, *Acinonyx jubatus*, *Felis silvestris*, *Otocyon megalotis*, *Vulpes chama* & *Giraffa camelopardalis*) under the Namibian legislation and near threatened (e.g. *Eidolon helvum*, *Hipposideros commersoni*, *Hipposideros vittatus*, *Hyaena brunnea* & *Panthera pardus*) and vulnerable (e.g. *Acinonyx jubatus*, *Equus zebra hartmannae*) by the IUCN (IUCN 2016).

3.5.3. Reptile Biogeography

Reptile diversity is high in the Namib Desert and the central Namib in particular has a surprisingly high diversity of lizards, especially geckos. The State Museum work, together with more recent literature (Griffin 2002 and Griffin 2007), lists a total of 33 lizard species recorded or having a high probability of occurrence in the study area.

The high percentage of endemic reptile species (43%) associated with the rocky escarpment region of central western Namibia underscores the importance of this area without formal state protection. The most important species expected to occur in the general area are viewed as the tortoise *Stigmochelys pardalis*; pythons – *P. anchietae* and *P. natalensis*–*Varanus albigularis* and some of the endemic and little-known gecko species – e.g. *Pachydactylus* species. Tortoises, snakes and monitor lizards are routinely killed for food or as perceived threats. Other important species are those viewed as “rare” – i.e. *Rhinotyphlops lalandei*, *Mehelya vernayi* & *Afroedura africana* – although very little is known about these species. An important, albeit little known and understudied species occurring in the Karibib area, is the Namibian Wolf Snake (*Lycophidion namibianum*) (Haacke

and Branch pers. com.). Indiscriminate killing of snakes is a threat to little known species. The project proponent should give time for shy animals to take refuge.

3.6. The General Geology, Surface and Ground Water

3.6.1. Local Geology

The local geology is dominated by quartz biotite schist and forms part of the major regional metasedimentary rocks of the Swakop Group (Miller, 2008 and 1992). The schist is often gradational to biotite quartzite / greywacke. In general, the schist is fine to medium grained, massive sections do occur throughout the stratigraphic section. The schist is typically moderately to well bedded. Bedding and the primary schistosity are, in general, defined by the alignment of fine to coarse-grained biotite. Bedding is commonly on the scale of 1 to 10 cm. Quartz and biotite are the most common constituents and are typically hosted within a fine grained, biotite, chlorite, and minor sericite matrix. Minor pink garnets are locally developed in some places. Surficial deposits are characterized by the following materials:

- (i) Minor boulders with rock fragments from localized loose rock head mainly quartz biotite schist; (ii) Gravels from the ephemeral river channels within the vicinity of the proposed solar park site;
- (ii) (iii) Sand and silts.

Figure 17 below outlines the geology map around the proposed project site. The project site is characterised by Schist, Marble, quartzite, conglomerate and graphitic schist. To the south and south eastern direction of the project area along the boundary of the farm finds larger portions of underlying Ortho- amphibolite and Mica Shist which are absent in the northern direction of the area under study. They make an impermeable layer of the soil increasing surface runoff on the downstream.

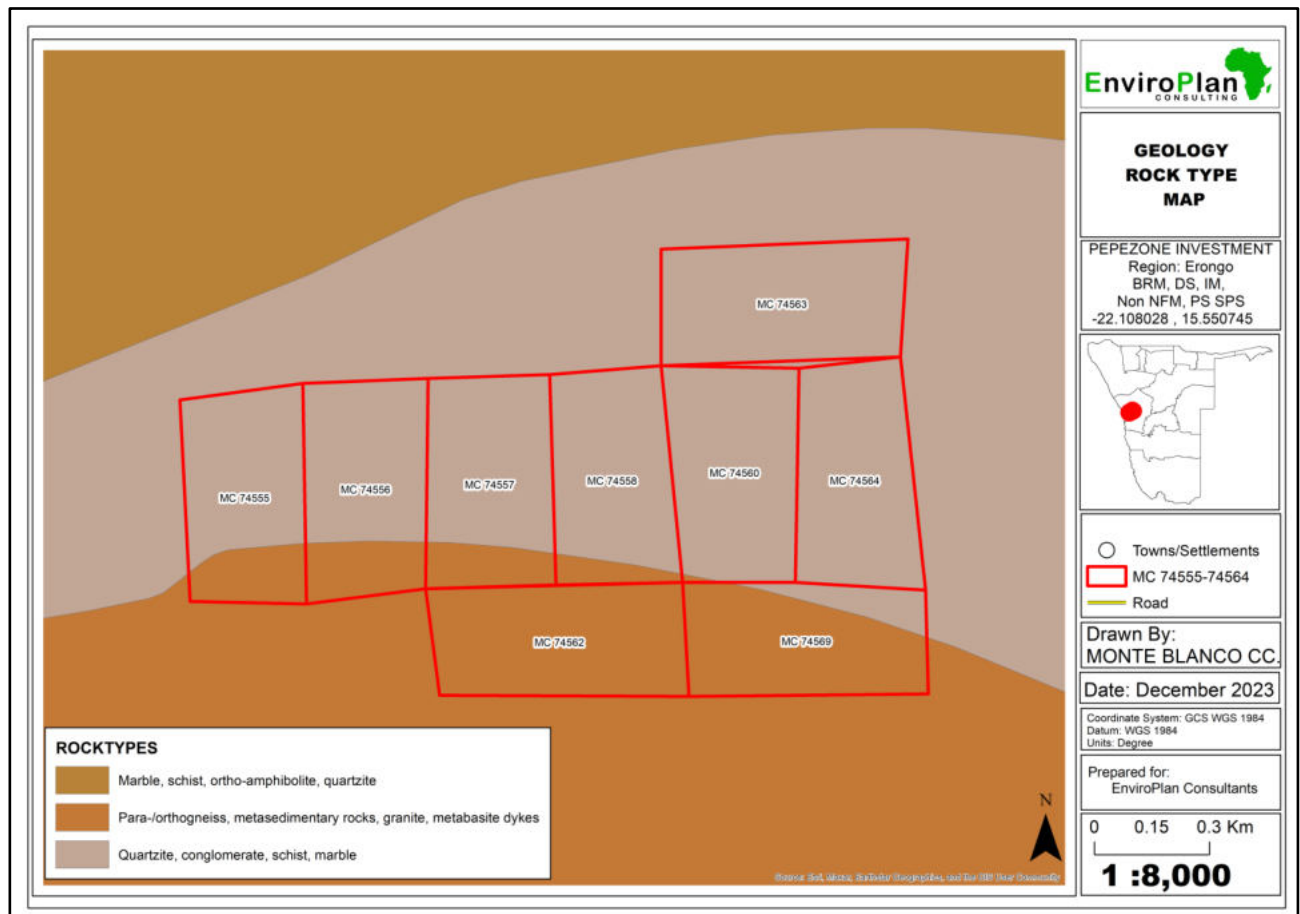


Figure 7: Rock type Map

3.6.2. Water Sources

Water supply for Farm activities is from groundwater resources supplied by a network of boreholes in the farm. Groundwater as well as surface water (only during the rainy season) from ephemeral river channels is the sources of water supply in the area as well as much of the Erongo Region. According to the Department of Water Affairs, (2001), the Erongo Region and in particular the Town of Usakos. The area with aquifer potential, more or less reflects the rainfall distribution, decreasing westwards. Knowledge of the aquifers in this area is sparse, due to the low number of boreholes and few on groundwater.

3.6.3. Water Vulnerability

The proposed project is likely to have no major negative impacts on the water resources. The local area does not seem to have economic water resources. Therefore, the development of the proposed project is likely to have no negative impacts on water resources. The combined effects of unsaturated and saturated flow probabilities were used as indicator for groundwater vulnerability. However, groundwater or surface water will only be vulnerable to contamination if the following three (3) component are all present at the same time and at a site-specific area within project area:

- (i) Contaminant sources resulting from proposed construction program;
- (iii) Potential pathways for contaminant migration such as major high order discontinuities

- (ephemeral river channels, valleys and gullies;
- (iv) (iii) Targets (economic water resources) present within the project area. Overall, the limited local groundwater resources found in the area form part of the poorly developed metamorphic rocks based confined and unconfined aquifer system that is moderately vulnerable to any sources of pollution

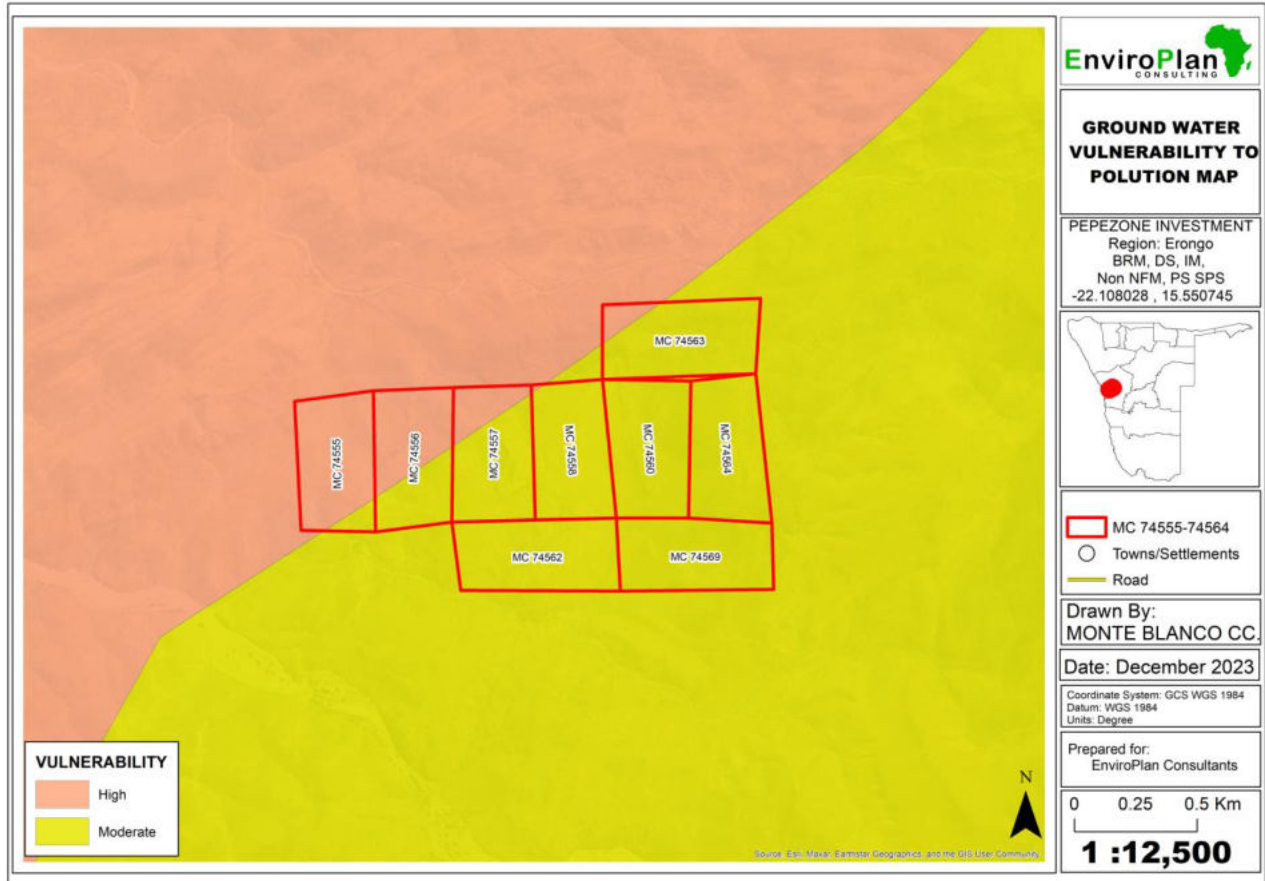


Figure 8 ground water vulnerability to pollution map

Small sandy riverbeds were identified the project area; however, these are ephemeral which means that they are normally dry on surface but occasionally flow immediately after heavy rainfall events. During designing and construction flood protection measures will be implemented. According to figure 9 overleaf (geo hydrology, aquifer map). The consultant team recommends that project designing should promote surface runoff and keep away from waterways and hilly portions.

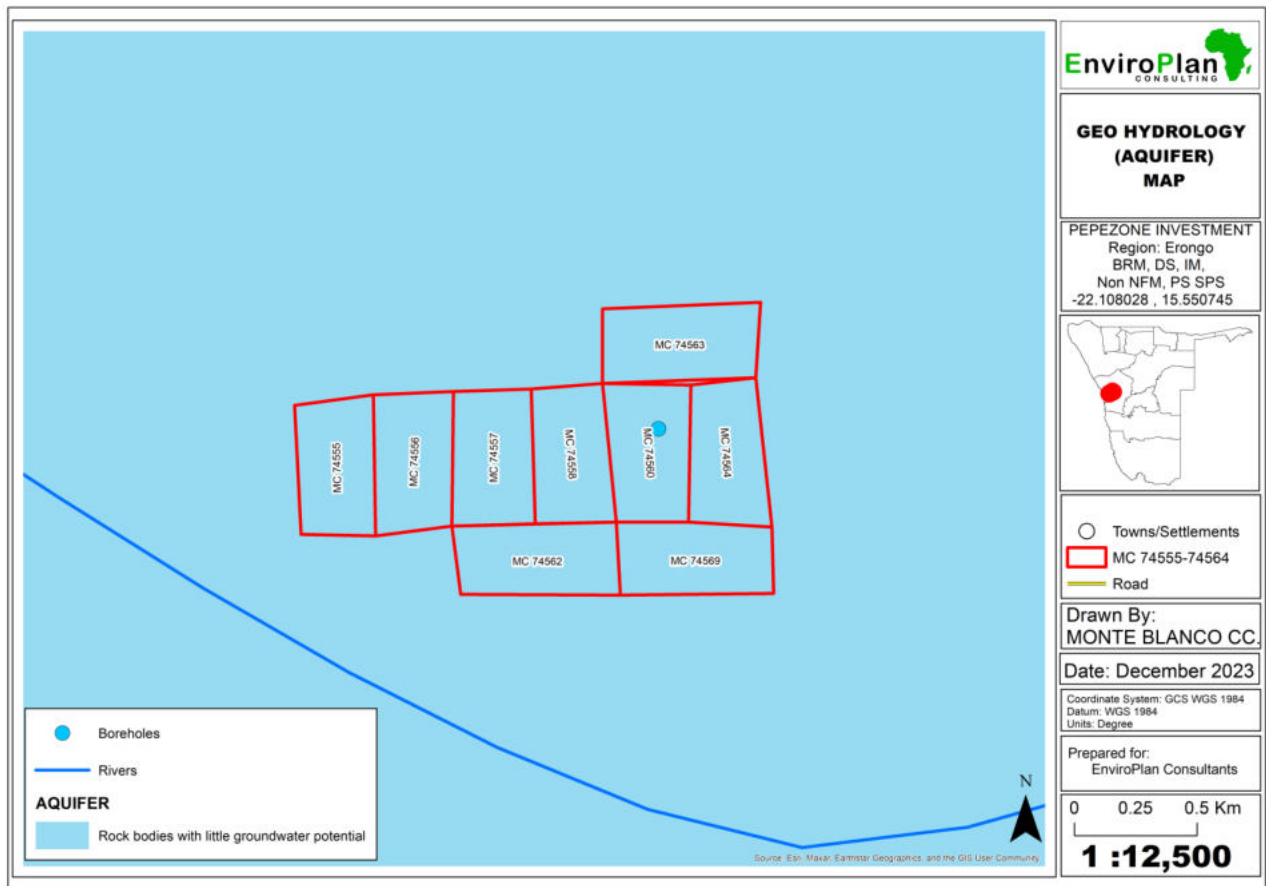


Figure 9: Geo Hydrology map

3.7. Topography

The proposed mining claims are in Usakos (Erongo), Namibia elevation is 891 meters and Usakos elevation in feet is 2923 ft above sea level. Usakos is a populated place with elevation that is 137 meters (449 ft) smaller than average city elevation in Namibia.

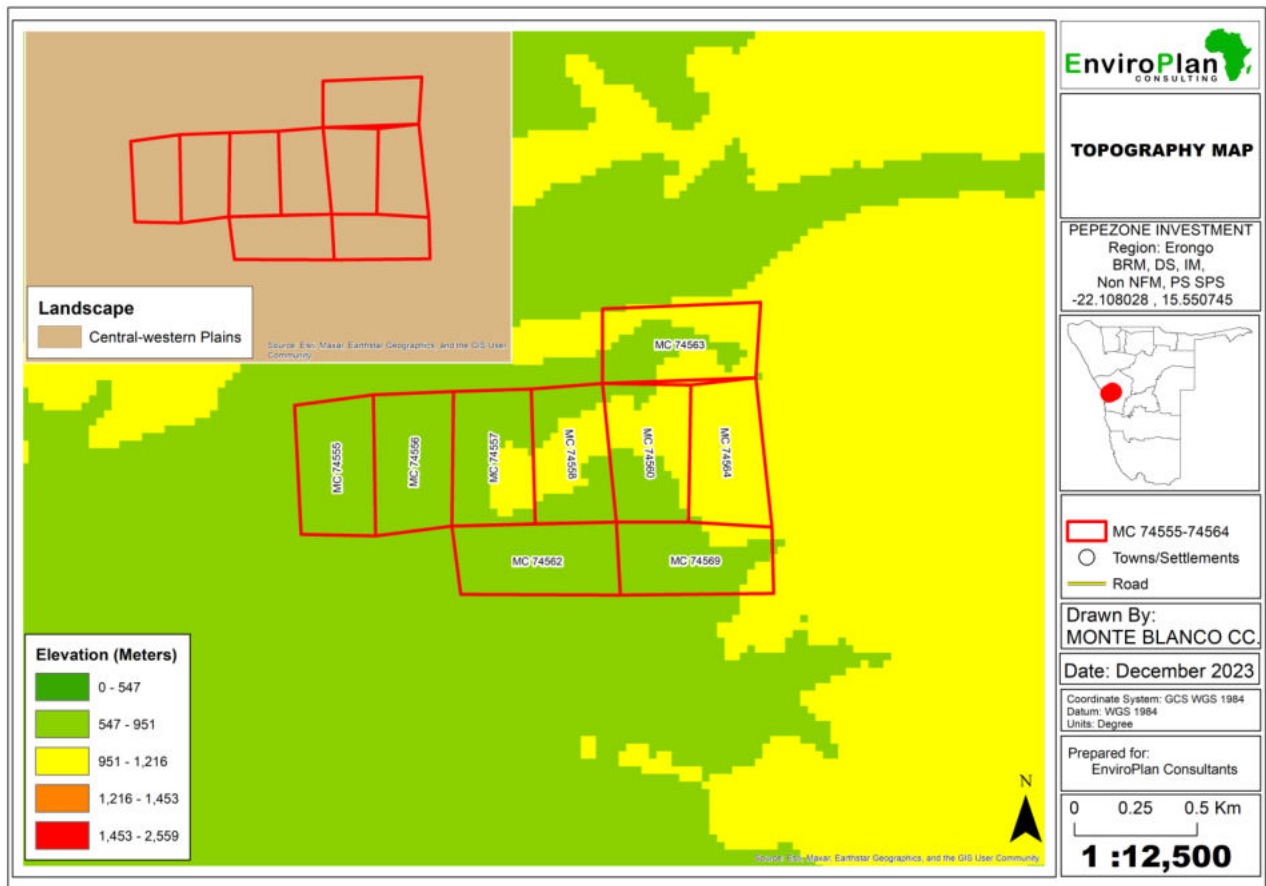


Figure 10: Topography Map

4. CHAPTER FOUR: PUBLIC CONSULTATION

4.1. Overview

Public and Stakeholder involvement is a key component of the EA process. The public consultation process, as set out in Section 21 of Regulation No 30 of EMA, has been followed during this assessment and the details thereof are documented below.

Public consultation forms an important component of an Environmental Assessment (EA) process. Public consultation provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. Public consultation has been done in accordance with both the EMA and its EIA Regulations.

The public consultation process assists the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and the extent to which further investigations are required. Public consultation can also aid in the process of identifying possible mitigation measures.

4.2. Approach

4.2.1. Interested and Affected Parties (I&APs)

An I&P is defined under the Environmental Management Act (2007) as:

- “Any person, group of persons or organization interested in or affected by an activity; and
- (b) Any organ of state that may have jurisdiction over any aspect of the activity”.

EnviroPlan identified specific I&APs, whom were considered interested in and/or affected by the proposed activities through the following means:

- Notification letters and/or emails were sent to those possibly interested and affected by the proposed project; and
- Notices were placed in the local newspapers requesting any potentially affected or interested members of the public to register as I&APs.
- A meeting with the I &A Ps was scheduled to be held on the 2nd of February 2024 on the proposed site but no one attended. Concerns received through emails and via WhatsApp were addressed in the ESMP making part of the report.

A summary of the I&APs identified is presented in Table 10. The complete list of I&APs is provided in Appendix B.

Table 6: Summary of Identified IAPs

List of IAPs	Description
	Ministry of Environment and Tourism
	Farm Lorensia 69 owner (Mr and Mrs
	Neighboring farm owner

4.2.2. Communication with I&APs

Regulation 21 of the EIA Regulations details steps to be taken during a given public consultation process and these have been used in guiding this process. Communication with I&APs regarding the proposed development was facilitated through the following means and in this order:

Table 7: Consultative engagement conducted

Date	Activity	I&AP
31.01.24	Questionnaire administration	Neighbour
02.02.24	Questionnaire administration	Farm Manager
28.02.24	Telephonic conversation	Farm owner

- A Background Information Document (BID) containing descriptive information about the proposed activities was compiled (Appendix C) and sent out to all identified and registered I&APs;
- Site notices were fixed at conspicuous locations in Usakos, and Project area (see Appendix C);

Public consultation was carried out according to the Environmental Management Act's EIA Regulations. After the initial notification, the I&APs were given three weeks to submit their comments on the project. The comment period will remain open until the final scoping report is submitted to MET. Met will also launch its commenting process through online EIA portal which allows everyone who is affected or interested about the proposed activities to contribute before the final decision is reached.

4.3. Printed Media

4.3.1. Background Information Document

A Background Information Document (BID) was drafted at the onset of the EA process to act as a useful information handout about the proposed road upgrade project. In addition, the BID provided details on the public consultation process with contact details for further information. This document was advertised for availability through various means of newspaper articles, public meeting and electronic mail; see Appendix C of this document.

4.3.2. Newspaper Advertisements & Articles

Newspaper notices about the proposed project and related EA processes was circulated in two newspapers for two weeks. Notices were placed in The Windhoek Observer and Confidante newspapers, briefly explaining the activity and its locality, and inviting members of the public to register as I&APs (Appendix C).

Table 8: Newspaper and Site Notices (Appendix c)

Newspaper	Area of Distribution	Language	Date placed
Windhoek Observer (Refer to Appendix C)	Country Wide	English	22 & 29 Jan 2024
Confidante (Refer to Appendix C)	Country Wide	English	2-8 Feb 2024 26 Jan- 2 Feb 2024
Site notices	Farm Lorensia 69 (Main gate) Along the access road	English,	02 Feb 2024

4.3.3. Building a Stakeholder Database

A stakeholder database for the project collected through a variety of means. During the advertisement of the project (through public notices in local newspapers and site-notices) the list was augmented as Interested & Affected Parties (I&AP) registered and contact information of stakeholders updated, please refer to Appendix C.



Figure 11: Public notification poster on neighboring farms

4.3.4. Comments and review period

Stakeholders have registered and provided comments from the onset of the public consultation process and the initial information sharing through the BID, newspaper and site notices.

The public commenting period from the onset of the EIA process and the Scoping Report and Environmental Management Plan was made available to the public and stakeholders for comment and review. MET will let the reports available on their website.

Attendance registers, comments and proof of stakeholder’s engagement are attached in appendix C of this ESR. Key Issues raised during the consultative meeting are presented below:

4.4. Conclusion

EnviroPlan concludes that the public participation was extensive and transparent enough to ensure any comments or issues regarding the proposed development were addressed and to suggest possible mitigation measures. All Identified affected parties were purposively approached and their concerns were taken into considerations.

5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1. Overview

The proposed activities have impacts on certain biophysical and social features. The identified impacts were assessed in terms of probability (likelihood of occurring), scale/extent (spatial scale), magnitude (severity) and duration (temporal scale) as presented in this chapter. To enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable.

It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact;
- Assessment of the pre- and post-mitigation significance of the impact; and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment.

The following criteria were applied in this impact assessment:

5.1.1. Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact. Table 9 shows rating of impact in terms of the extent of spatial scale.

Table 9: Extent or spatial impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localised within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries

5.1.2. Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. Table 10 shows the rating of impact in terms of duration.

Table 10:Duration of Impact

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long- term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

5.1.3. Intensity, magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These were also taken into consideration during the assessment of severity. **Table 11** shows the rating of impact in terms of intensity, magnitude or severity.

Table 11: Intensity, magnitude and severity of impact

Type of Criteria	Negative				
	H-(10)	M/H (8)	M-(6)	M/L (4)	L-(2)
Qualitative	Very high deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.

5.1.4. Probability of occurrence

Probability describes the likelihood of the impacts actually occurring. This determination is based on previous experience with similar projects and/or professional judgment. See Table 12 for impact rating in terms of probability of occurrence.

Table 11: Probability of occurrence impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this chapter, for this assessment, the significance of the impact pre-and post-mitigation actions was measured.

Once the above factors (Table 9, Table 10, Table 11, Table 12 and 13) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

$$SP = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (Table 13, overleaf).

Table 12: Significance rating scale

<i>SIGNIFICANCE</i>	<i>ENVIRONMENTAL SIGNIFICANCE POINTS</i>	<i>COLOUR CODE</i>
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	>-60	H

For an impact with a significance rating of high (negative), mitigation measures are recommended to reduce the impact to a low or medium significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period of time to enable the confirmation of the significance of the impact as low or medium and under control.

The impact assessment for the proposed activities is given below.

5.2. Mining activities Impact Assessment

The mining phase is mostly concerned with the preparation of the site for access roads, drilling sites and camping sites. The potential impacts during this phase include loss of biodiversity, dust and noise during site clearing and preparation. Mining activities will be done using applicable mining methods but not limited to open cast mining, quarrying and diamond cutting

5.3. Impact Assessment on Biodiversity Loss

A number of indigenous trees are located along the mountain and riverine areas. Some vegetation may need to be removed for accessibility. This may also lead to habitat destruction for some fauna. As such, care should be taken during the removal of vegetation for site preparation to ensure minimal disturbance in the area. The envisaged impact at the project site is thus not of such magnitude and/ or significance that it will have irreversible impacts on the biodiversity and endemism of the area and Namibia at large. The pre- mitigation impact is assessed to be “medium” in significance and after mitigation the impact is assessed to have a “low” significance. The assessment of this impact is presented in Table 14.

Table 13: Assessment of the impacts on biodiversity loss

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 3	L/M - 5	M - 6	M - 3	M - 42
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L-4

5.3.1. Mitigations and recommendations to biodiversity loss

- Large indigenous trees on site need to be identified, marked, surveyed and are not to be removed or damaged.
- Trees with a trunk size of 150 mm and bigger should be surveyed, marked with paint (readily visible) and protected.
- Protected tree species as per the Forest Act No 12 of 2001 and Forest Regulations of 2015 may not be removed without a permit from the Ministry of Agriculture, Water and Forestry.
- Workers should be trained on the importance of conserving trees during construction activities and should be sensitised to be vigilant against any practice that will have a harmful effect on vegetation.

5.4. Impact Assessment on Dust Generation

Site clearing and drilling activities may lead to the generation of dust which could impact the local communities and businesses negatively, if not properly handled. This may pose a negative health impact on the surrounding communities and nearby vegetation. Dust is commonly impacting plants with wide leaves mostly their respiration process. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 15.

Table 14: Assessment of the impacts of dust generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 3	L/M - 5	M - 6	M - 3	M - 27
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L-4

5.4.1. Mitigations and recommendations to dust generation

- Dust suppression techniques should be implemented e.g. spraying of water on site or where heavy vehicles are moving to reduce dust levels to an acceptable standard.
- The local community and surrounding businesses should be continuously consulted to ensure that the dust levels are acceptable.

- Community members and businesses should be informed prior to any clearing of vegetation commencing so that they are aware of the planned work.
- During high wind conditions, the contractor must make the decision to cease works until the wind has settled.
- Stockpiles should be covered with plastic to reduce windblown dust.
- Workers should be provided with dust masks.

5.5. Impact Assessment on noise generation

Heavy vehicles are most likely to increase the ambient noise. Caterpillars, JCBs, Tipper trucks, blasting activities can increase noise levels to the immediate environment. Noise can be a nuisance to the people, wildlife. Shy animals are believed to be surviving within the project site.

5.5.1. Mitigations and recommendations to noise generations

Site preparation activities should be limited to daytime hours (between 08h00 and 17h00) unless otherwise arranged with community members and businesses in the area. Shy animals should be given enough time to move away.

5.6. Impact Assessment on Environmental Degradation

During mining different types of waste may be generated on-site. This may include general waste as well as hazardous chemicals and hydrocarbons which may cause degradation of the subject environment if not correctly managed and contained. Furthermore, the presence of the workforce and machinery may enhance environmental destruction within the subject site. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 16.

Table 15: Assessment of impacts on environmental degradation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M – 3	M – 4	M – 4	M – 32
Post-mitigation	L - 1	L- 1	L- 2	L - 1	L-4

5.6.1. Mitigations and recommendations to environmental degradation

- All types of waste should be effectively managed on site.
- Hazardous substances and hazardous waste materials should be carefully and correctly handled and stored on site according to guidelines in the EMP.
- Contractors should be trained on the importance of protecting the environment.

- Contractors should be trained on EMP compliance and sensitized to ensure that they respect and protect the environment during the work.

5.7. Impact Assessment of Waste Generation

Mining activities usually generate waste which may lead to environmental pollution, if not properly handled. This may result in blocked waterways should waste be blown into water ways; animals may choke on waste when ingested and additionally it may pose a negative visual impact on the surrounding environment. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to a “low” rating. The assessment of this impact is presented in Table 16.

Table 16: Assessment of impacts on waste generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M – 3	M – 4	M – 4	M – 32
Post-mitigation	L - 1	L- 1	L- 2	L – 1	L-4

5.7.1. Mitigations and recommendation to waste generation

- The mining site should be kept tidy at all times.
- All domestic and general mining waste produced on a daily basis should be cleaned and contained.
- No waste may be buried or burned on site or anywhere else.
- Waste containers (bins) should be emptied during and after mining activities and the waste removed from site to the municipal waste disposal site on a covered vehicle (to prevent waste blowing off the vehicle into the environment).
- Separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.
- Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter.
- No waste may remain on site after the completion of the project.
- The recycling of waste should be considered and implemented as far as possible.

5.8. Impact Assessment of Soil, Surface and Groundwater

Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil, surface and groundwater contamination, in case of spills and leakages. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 17 overleaf.

Table 17: Assessment of the impacts on soil, surface and groundwater

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M – 3	L/M – 4	M – 6	M – 4	M - 52
Post-mitigation	L – 1	L- 1	L- 2	L – 1	L-4

5.8.1. Mitigations and recommendation to soil, surface and groundwater

- Careful storage and handling of hydrocarbons on site is essential.
- Workers responsible for the storage and handling of hydrocarbons should be suitably trained to do so and trained on spill prevention (e.g. the use of drip trays) and the handling of potential spills should they occur, to be able to ensure implementation on site.
- Potential contaminants such as hydrocarbons and wastewater should be contained on site and disposed of in accordance with municipal wastewater discharge standards so that they do not contaminate surrounding soils, surface water and eventually groundwater.
- An emergency plan should be available for major / minor spills at the site during operation activities (with consideration of air, groundwater, soil and surface water) and during the transportation of the product(s) to the site.

5.8.2. Mitigations and recommendations to dust generation

- Dust abatement techniques should be implemented e.g. spraying of water on site to reduce dust levels to an acceptable standard.
- The local community and surrounding businesses should be continuously consulted to ensure that the dust levels are acceptable.
- Community members and businesses should be informed prior to construction commencing so that they are aware of the planned construction.
- During high wind conditions the contractor must make the decision to cease works until the wind has settled.
- Stockpiles and sand being transported should be covered with plastic to reduce windblown dust.
- Workers should be provided with dust masks.

5.9. Impact Assessment of Noise Generation

Exploration activities and the presence of construction vehicles may lead to the generation of noise which could impact the local communities and animals negatively, if not properly handled. This may pose a disturbance on the surrounding communities. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of

the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 18 overleaf.

Table 18: Assessment of the impacts of noise generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M – 2	L/M – 2	M - 6	M – 3	M - 27
Post-mitigation	L – 1	L- 1	L- 2	L - 1	L-4

5.9.1. Mitigations and recommendation to noise generation

- Construction activities should be limited to daytime hours (between 08h00 and 17h00) unless otherwise arranged with community members and businesses in the area.
- No amplified music should be allowed on site.
- Technology such as silencers should be installed on construction machinery.
- The use of horns as a general communication tool should not be allowed, they should only be used when necessary, as a safety measure.

5.10. Impact Assessment of Archaeological and Heritage Resources

The proposed construction activities are not taking place in an area that has significant archaeological or heritage resources. However, should these be encountered during the upgrade activities, mitigation measures need to be in place to ensure that these resources are not harmed. Memorial sites were identified along the road which are to be preserved during the proposed upgrade. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 19 below.

Table 19: Assessment of the impacts on archaeological and heritage resources

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 4	M - 6	M – 1	M - 11
Post-mitigation	L - 1	L- 1	L- 2	L - 1	L-4

5.10.1. Mitigations and recommendation to archaeological and heritage resources

- All works are to be immediately ceased in an affected area should an archaeological or heritage resource be discovered.

- The National Heritage Council of Namibia (NHCN) should advise with regards to the removal, packaging and transfer of the potential resource.

5.11. Impact Assessment of Temporary Employment Creation

The proposed activity may provide employment opportunities for the local people. Additional benefits may arise depending on the agreements reached between the community and the Proponent. The impact can be rated as of a “low-positive” significance. The assessment of this impact is presented in Table 20.

Table 20: Assessment of impacts on temporary employment creation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M + 2	L/M + 2	M + 2	M + 3	L+ 18
Post-mitigation	L + 4	L+ 3	L+ 2	L + 3	L + 27

5.11.1. Recommendations for temporary employment creation

- Should any job opportunities result, they should be made available to the local people in the area as far as reasonably possible.
- Should materials or resources be sourced from communities, they should be sufficiently compensated in a manner agreed between the community and the proponent/contractor.

5.12. Impact Assessment of Health, Safety and Welfare

Proposed activities may cause health and safety risks to people operating on the site. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 21.

Table 21: Assessment of impacts on health, safety and welfare

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M – 2	L/M - 2	M - 6	M – 3	M - 27
Post-mitigation	L – 1	L- 1	L- 2	L - 1	L-4

5.12.1. Mitigations and recommendations to health and safety

- Employees should be provided with awareness training about the risks associated with the proposed upgrade work such as hydrocarbon handling and storage, the handling of heavy machinery etc.
- During the works conducted, workers should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, safety glasses etc.
- The contractors should comply with the provisions with regards to health and safety as outlined in the Labour Act (No. 6 of 1992).

6. CHAPTER SIX: RECOMMENDATIONS AND CONCLUSION

6.1. Conclusion

The key potential biophysical impacts related to the mining and decommissioning phases of the proposed project were identified and assessed. Suitable mitigation measures (where required and possible) were recommended, and the impacts can be summarised as follows:

6.1.1. Impacts on biodiversity:

There are some large indigenous trees that may be affected, As such, no vegetation removal is recommended, unless a permit is issued by DEAF to ensure minimal disturbance in the area. The likelihood of this impact is low. However, the impact can be adequately addressed by the recommendations and management actions given in the EMP.

6.1.2. Impacts on environmental degradation:

Mining might result in degradation of the immediate environment. Furthermore, the presence of the workforce and machinery may aid in environmental destruction within the project site. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to low rating. The impact can be adequately addressed by the recommendation management actions given in the ESMP.

6.1.3. Impacts on waste generation:

Mining activities usually generate waste, which leads to environmental pollution, if not properly handled. This may result in blocked waterways should waste be blown into water ways; animals may choke on waste when ingested and it may pose a negative visual impact on the surrounding environment. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to low rating. The impact can be adequately addressed by the recommendations and management actions given in the EMP.

6.1.4. Impacts on soil, surface and groundwater contamination:

Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to spills and leakages which could cause soil, surface and groundwater contamination. The impact can be adequately addressed by the recommendations and management actions given in the ESMP.

6.1.5. Impacts on dust generation:

Site clearing, mining activities and the presence of construction vehicles may lead to the generation of dust which could impact the local communities negatively, if not properly handled. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the

implementation of the mitigation measures, the impact will be significantly reduced to low rating. The impact can be adequately addressed by the recommendations and management actions given in the ESMP.

6.1.6. Impact on noise generation :

Site clearing and mining will generate noise on site and existence of heavy vehicles may lead to the generation of noise which could impact the local communities negatively, if not properly handled. This may pose a disturbance on the surrounding communities. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to low rating. The impact can be adequately addressed by the recommendations and management actions given in the ESMP.

6.1.7. Impact on archaeological and heritage resources (during all phases):

The proposed activity is not taking place in an area that has significant archaeological or heritage resources. However, should these be encountered during the construction activities, mitigation measures need to be in place to ensure that these resources are not harmed. The impact can be adequately addressed by the recommendations and management actions given in the ESMP.

6.2. Recommendation

Based on the information provided in this report, EnviroPlan is confident the identified risks associated with the proposed project can be reduced to acceptable levels, should the measures recommended in the ESMP be implemented and monitored. It is therefore recommended that the project receive Environmental Clearance, provided that the ESMP be implemented.

7. REFERENCES

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8. APPENDICES

9. Appendix A: Environmental and Social Management Plan

10. Appendix B: Fauna and Flora study

11. Appendix C: Public consultation documents

12. Appendix D:Picture Inventory, Maps and Layout plans

13. Appendix E:Lead EAP Resume