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REPORT:

SCOPING REPORT FOR THE GERGARUB MINING PROJECT ON ML 245, //KHARAS REGION, NAMIBIA.

PROJECT NUMBER: ECC-99-425-REP-05-D

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//Kharas Region, Namibia.

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DISCLAIMER

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EXECUTIVE SUMMARY

Environmental Compliance Consultancy (ECC) has been appointed as the environmental assessment practitioner (EAP) by Gergarub Exploration and Mining (Pty) Ltd (referred to as the Proponent or Gergarub herein) to conduct an environmental and social impact assessment (ESIA) for mining of base metals namely lead, zinc and silver, within mining licence 245 (ML 245). The area is located in the Oranjemund Constituency, 15km north of the town of Rosh Pinah in the Karas Region in southern Namibia shown in (see Figure 1).

Gergarub Mining and Exploration (Pty) Ltd owns the Gergarub project (Project), a joint venture agreement between Vedanta Zinc International (51 %), via its Namibian subsidiary Skorpion Zinc Mine, and Rosh Pinah Zinc Corporation, or Rosh Pinah (49 %) (JV).

The proposed Gergarub Project will be an underground mine using the long hole open stoping (LHOS) and Drift and Fill (DAF) with a backfill mining method. The proposed Project will be referred to herein as the "Gergarub Project" or the "Project". Additionally, LHOS will be supplemented with Drift and Fill (DAF) mining which will be used to mine the orebody extremities and maximize the overall recovery of the Mineral Resource.

In terms of the Namibian Environmental Management Act, No. 7 of 2007 and its regulations, the Ministry of Mines and Energy (MME) is the competent authority for the proposed Project. Mining operations trigger listed activities in terms of the Act, and as such, requires an environmental clearance certificate.

SCREENING PHASE

The Environmental Management Act, No. 7 of 2007, and its associated 2012 regulations, stipulate that an environmental clearance certificate is required before undertaking any of the listed activities that are identified in the Act and its regulations. Potential listed activities triggered by the Project are provided in Table 2. All previous data and scientific reports were utilised during the screening phase to determine the potential environmental and social impacts of the Project, which are listed below:

- Air quality impact assessment
- Surface water impact assessment
- Groundwater impact assessment
- Vegetation impact assessment
- Fauna impact assessment
- Bird impact assessment
- Social impact assessment
- Archaeological impact assessment
- Visual impact assessment

SCOPING PHASE

The objective of the scoping phase was to obtain a thorough understanding of the biophysical and socioeconomic environment in which the Project is located, using baseline and specialist studies. It also provided an opportunity for the public to have input into the scope of the assessment. The technical inputs combined with the inputs from the I&APs during the previous engagements led to the development of the Terms of Reference (ToR) for the assessment phase.

The following was considered during the preparation of the scoping report:

- Desktop and literature research
- Specialist studies available from 2015
- Site visit conducted in March 2023

TERMS OF REFERENCE

The ToR within the scoping report proposed for the assessment phase and covers the following:

Groundwater and surface water assessment

- A review of the existing information on the revised mine layout and associated surface and groundwater documents, including a review of design recommendations for ground and surface water control measures.
- A revision of the groundwater impact assessment for the updated mining layout as part of the amended ESIA report including a revision of the current groundwater model.
- Revise the surface water impact assessment for the updated mining layout (as provided by the Proponent) as part of the amended ESIA report including revision of the current stormwater management plan.
-

Noise assessment

The assessment will include a study of the effects of noise from various sources on the biophysical and social environments on and surrounding the proposed mine site including the C13 road.

Air quality

The assessment will include a desktop review of all available project data, including meteorological data, previous air quality assessments, EIAs, and technical air quality data and modelling results.

Mine-induced blast and vibration assessment

The assessment will include vibration level records from past blasting activities that may have potentially been measured on-site may be used to identify potential impact zones within and adjacent to the mining licence.

Traffic Assessment

This assessment will assess whether the C13 route would be able to manage an increase in traffic volume from the proposed Project and existing surrounding receptors.

Socio-economic assessment

The assessment will look at the impact of the project associated with an influx of workers and an increase in the population of the town, an increase in services that may be required and an increase in revenue in the town due to an increase in the number of jobs. It will also look at housing and accommodation and how the Project will affect that.

Additionally, the scoping report defines the impact methodology for the impact assessment phase of the ESIA, this is included in chapter 6 of this report. The evaluation and identification of the environmental and social impacts require the assessment of the Project characteristics against the baseline characteristics, ensuring that all potentially significant impacts are identified and assessed.

The impact's significance is determined by considering the sensitivity and importance/value of environmental and social receptors that may be affected by the proposed Project, the nature and characteristics of the impact, and the magnitude of any potential change. The magnitude of change (the impact) is the identifiable changes to the existing environment that may be negligible, low, minor, moderate, high, or very high; temporary/short-term, long-term or permanent; and either beneficial or adverse.

The next stage of this assessment is to conduct the impact assessment which will include updated specialist impact assessments as well as relevant amendments of the preliminary EMP. All I&AP comments on the Scoping Report, if any, will be responded to, by providing an explanation or further information in the response table, which is attached as an addendum report to this final scoping report.

Once finalised, prior to formal submission, the final ESIA report and appendices. Once finalised, prior to formal submission, the final ESIA report and appendices, including relevant specialist reports, will be made available to all registered I&APs and stakeholders for comment.

The final ESIA report and appendices will then be formally submitted to the Environmental Commissioner as well as the competent authority, the MME and, the to the MEFT as part of the application for an environmental clearance certificate for the Gergarub Project. The phases of the ESIA are provided in Figure 2.

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ABBREVIATIONS

Abbreviation	Description
%	percentage
AAB	A-mine and B-mine
Ag	silver
AIDS	Acquired Immune Deficiency Syndrome
AMC	AMC Consultants (UK) Limited
BH	Borehole
BID	Background Information Document
CIA	cumulative impact assessment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DAF	Drift and Fill
dB(A)	decibels
DEA	Directorate of Environmental Affairs
ECC	Environmental Compliance Consultancy
EGL	Effective Grinding Length
EHS	Environmental health and safety
EIA	environmental impact assessment
EMA	Environmental Management Act
EMP	environmental management plan
EPCM	engineering, procurement and construction management
EPL	exclusive prospecting licence
ESIA	environmental and social impact assessment
ESMP	environmental and social management plan
Fe	iron
g/t	grams per tonne
Ga	billions (thousand million) of years ago
GDP	gross domestic product
GLCR	Glencore
GRU	groundwater resource unit
GSAP	geochemical sampling and analysis plan
HIV	Human Immunodeficiency Virus
I&APs	Interested and affected parties
IFC	International Finance Corporation
JV	joint venture
km	kilometres
km ²	kilometres squared

Abbreviation	Description
kV	kilovolts
L	Litre
L/s	Litre per second
LHD	Load Haul Dump
LHOS	long hole open stoping
LOM	life of mine
LP	Limited Partner
Ltd	limited
m	metre
m/s	metre per second
Ma	Million years ago
M ³	cubic metres
m ³ /a	cubic metres per annum
M ³ /day/borehole	cubic metres per day per borehole
m ³ /hour	cubic metres per hour
M ³ /t/h	cubic metres per ton per hour
MAWLR	Ministry of Agriculture, Water and Land Reform
mbgl	meters below ground level
MCF	Mine Closure Framework
MD	Maximum Demand
MDRL	mineral deposit retention licence
MEFT	Ministry of Environment, Forestry and Tourism
mg/m ² /day	milligrams per metres squared per day
ML	mining licence
mm	millimetre
mm/a	Millimetres per annum
mm ³	millimetre cubed
mm/a	Millimetre per annum
MME	Ministry of Mines and Energy
MoU	Memorandums of Understanding
MSO	Mineable Shape Optimizer
Mt	million tonnes
Mtpa	million tonnes per annum
MVA	megavolt ampere
MW	megawatts
MWT	Ministry of Works and Transport
N	North
NamPower	Namibia Power Cooperation (Pty) Ltd

Abbreviation	Description
NamWater	Namibia Water Cooperation (Pty) Ltd
NB	Nominal bore
NDP	national development plan
NHC	National Heritage Council
NI 43-101	National Instrument 43-101 Standards of Disclosure for Mineral Projects
No.	number
NSR	noise sensitive receptors
OZ	Ore Zone
Pb	Lead
PEA	preliminary economic assessment
PFS	Pre-feasibility study
pH	Acidity alkalinity unit
PNZ	Port Nolloth Zone
Pty	proprietary
RAB	rotary air blast
RC	reverse circulation
ROM	run of mine
RoshSkor	Rosh Pinah Skorpion
RP2.0	Rosh Pinah Expansion
RPZC	Rosh Pinah Zinc Corporation
SAG	semi-autogenous grinding
SAMREC	The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral
SANS	South African National Standards
SPI	Standard Practice Instruction
SQUID	superconducting quantum interference device
SSW	South-southwest
SW	southwest
SZM	Skorpion Zinc Mine
t	tonnes
TB	Tuberculosis
ToR	Terms of Reference
tpa	tonnes per annum
TSF	tailings storage facility
US\$	United States Dollar
UST	United States Taxable
Vedanta	Vedanta Resources plc
VTEM	Versatile Time Domain Electromagnetic

Abbreviation	Description
W/W	Weight by Weight or Weight for Weight
WNW	West-northwest
Zn	zinc

1 INTRODUCTION

1.1 COMPANY BACKGROUND

Environmental Compliance Consultancy (ECC) has been retained by Gergarub Exploration and Mining (Pty) Ltd base metals mining and exploration company jointly owned by Skorpion Mining Company Pty Ltd (51%) and Rosh Pinah Zinc Corporation (49%) referred to hereinafter as the Proponent. ECC is conducting an environmental and social impact assessment (ESIA) for mining of base metals, namely lead and zinc (plus silver), within a proposed mining licence (ML) area (ML 245) located on Mineral Deposit Retention Licence 2616 (MDRL 2616).

The Skorpion Zinc Mine (SZM) was acquired by Vedanta Resources plc (Vedanta) in December 2010. Vedanta is a globally diversified Natural Resources Company with interests in zinc, lead, silver, iron ore, steel, copper, aluminium, power and oil and gas. Trevali Mining Corporation (Trevali) is the majority shareholder of the Rosh Pinah Zinc Mine (RPZC), it is a zinc-focused base metals mining company that is going through a sales and investment solicitation process for its 90% interest in the Rosh Pinah Mine. Trevali has entered into a share and asset purchase agreement with Appian Natural Resources Fund III LP and Appian Natural Resources (UST) Fund III LP (collectively, the "Purchasers") dated December 15, 2022 (the "Agreement") to sell to the Purchasers its 90%-interest in the Rosh Pinah Mine by way of a sale of the shares (the "GLCR Shares") held by Trevali in GLCR Ltd. ("GLCR"), a wholly owned UK subsidiary of Trevali.

The Proponent has focused on the development of potential zinc, lead and silver projects in Namibia through extensive exploration programmes. The proposed Gergarub Project will be an underground mine using the long hole open stoping (LHOS) and Drift and Fill (DAF) with a backfill mining method. The proposed Project will be referred to herein as the "Gergarub Project" or the "Project". Additionally, LHOS will be supplemented with Drift and Fill (DAF) mining which will be used to mine the orebody extremities and maximize the overall recovery of the Mineral Resource.

The proposed Project area is located in the Oranjemund Constituency, 15km north of the town of Rosh Pinah in the Karas Region in southern Namibia shown in Figure 1.

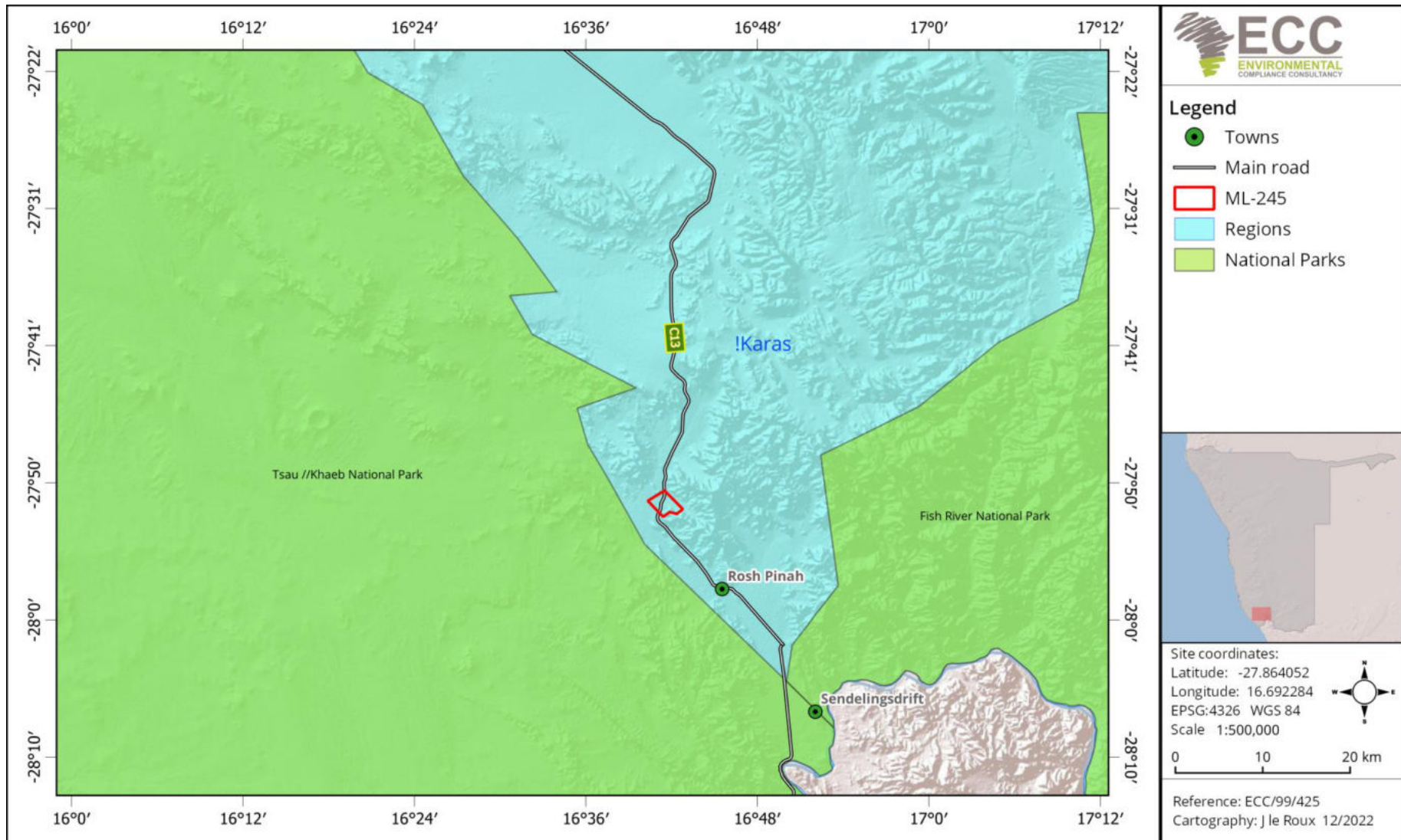


Figure 1 – Locality of the project

1.2 PURPOSE OF THE SCOPING REPORT

An environmental and social impact assessment (ESIA) has commenced in terms of the requirements of the Environmental Management Act, No. 7 of 2007, and its associated 2012 regulations. The purpose of this report is to present the findings of the scoping study phase that forms part of the larger ESIA process.

The scoping report summarises the prescribed ESIA process followed; provides information on the baseline biophysical and socio-economic environments, project description and details; outlines the terms of reference for the assessment phase; and presents a preliminary environmental management plan (EMP), which is provided as Appendix A.

The scoping report and appendices will be submitted to the public for review and input on the impacts and the related ESIA terms of reference. The revised scoping report with public input is submitted to the Ministry of Mines and Energy (MME) as the competent authority for the Project, after which it will be submitted to the Ministry of Environment, Forestry and Tourism (MEFT) - Directorate of Environmental Affairs (DEA) for a record of decision.

Chapter 1 of the report is an introduction to the proposed project and ESIA. Chapter 2 provides detail about the ESIA approach, including the roles of the public and specialists. Chapter 3 provides additional detail on the legal environment and requirements. Chapter 4 provides sufficient detail on the project to identify and assess potential impacts. Chapter 5 provides an overview of the screening and scoping results and related baseline information identifying all relevant biophysical and social aspects. Chapter 6 provides an overview of the methodology for identifying and evaluating impacts. Chapters 7 and 8 cover the resultant Terms of Reference for the final assessment and the conclusions, respectively.

1.3 THE PROPONENT OF THE PROPOSED PROJECT

Gergarub Exploration and Mining (Pty) Ltd is the proponent for the proposed project. The Proponent details are provided in Table 1.

Table 1 - Proponent's details

Company Representative	Contact Details
Ms Sheron Kaviua Director	Gergarub Exploration and Mining (Pty) Ltd P O Box 90757 Windhoek, Namibia SKaviua@trevali.com

1.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

The report has been prepared by Environmental Compliance Consultancy (Pty) Ltd (ECC) (Reg. No. 2022/0593) on behalf of the Proponent. Authored by ECC employees with no material interest in the report's outcome, ECC maintains independence from the Proponent and has no financial interest in the Project apart from fair remuneration for professional fees. Payment of fees is not contingent on the report's results or any government decision. ECC members or employees are not, and do not intend to be, employed by the Proponent, nor do they hold any shareholding in the Project. Personal views expressed by the writer may not reflect ECC or its client's views. The environmental report's information is based on the best available data and professional judgment at the time of writing. However, please note that environmental conditions can change rapidly, and the accuracy, completeness, or currency of the information cannot be guaranteed.

All compliance and regulatory requirements regarding this report should be forwarded by email or posted to the following address:

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1.5 ENVIRONMENTAL REQUIREMENTS

The Environmental Management Act, No. 7 of 2007, and its associated 2012 regulations, stipulate that an environmental clearance certificate is required before undertaking any of the listed activities that are identified in the Act and its regulations. Potential listed activities triggered by the Project are provided in Table 2.

Table 2 - Listed activities potentially triggered by the Project.

Listed activity	EIA screening finding
<p>ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES</p> <p>The construction of facilities for:</p> <p>(1a) The generation of electricity.</p> <p>(1b) The transmission and supply of electricity.</p>	<ul style="list-style-type: none"> - The proposed Project will connect to the national power grid supplied by NamPower. - Alternatively, the Proponent may possibly consider developing a renewable energy plant (i.e., solar) for the generation of supplementary power
<p>WASTE MANAGEMENT, TREATMENT, HANDLING, AND DISPOSAL ACTIVITIES</p> <p>(2.1) The construction of facilities for waste sites, treatment of waste and disposal of waste.</p> <p>(2.2) Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.</p> <p>(2.3) The import, processing, use and recycling, temporary storage, transit or export of waste.</p>	<ul style="list-style-type: none"> - Facilities for the disposal of mine and domestic waste will need to be constructed. - In terms of the Atmospheric Pollution Prevention Ordinance, the bulk storage and handling of mineralised or metallic ore on waste dumps designed to hold 100 000 metric tonnes or more, is defined as a scheduled process
<p>MINING AND QUARRYING ACTIVITIES</p> <p>(3.1) The construction of facilities for any process or activities which requires a license, right or another form of authorization, and the renewal of a license, right or another form of authorization, in terms of the Minerals (Prospecting and Mining Act), 1992.</p> <p>(3.2) Other forms of mining or extraction of any natural resources whether regulated by law or not.</p> <p>(3.3) Resource extraction, manipulation, conservation and related activities.</p>	<ul style="list-style-type: none"> - This listed activity infers the provisions of the Minerals (Prospecting and Mining) Act 33 of 1992. The very nature of the Project is mining, which therefore triggers this listed activity.

Listed activity	EIA screening finding
<p>FORESTRY ACTIVITIES (4.) The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act, 2001 (Act No. 12 of 2001) or any other law</p>	<ul style="list-style-type: none"> – Vegetation clearing will be required for site construction and infrastructure establishment. – During operations, vegetation clearing will be required as the Project develops. The necessary permits will be acquired as needed.
<p>WATER RESOURCE DEVELOPMENT (8.5) Construction of dams, reservoirs, levees, and weirs. (8.6) Construction of industrial and domestic wastewater treatment plants and related pipeline systems.</p>	<ul style="list-style-type: none"> – An estimated amount of water that will be required by the mine monthly is 81 000 m³ which will be supplied from the Orange River by NamWater via +/- 20km 200 nominal bore (NB) pipeline. – Construction of a wastewater treatment plan.
<p>HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE (9.1) The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974. (9.2) Any process or activity which requires a permit, licence or other form of authorization, or the modification of or changes to existing facilities for any process or activity which requires amendment of an existing permit, licence or authorization or which requires a new permit, licence or authorization in terms of a governing the generation or release of emissions, pollution, effluent or waste. (9.4) The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.</p>	<ul style="list-style-type: none"> – Both fuel and hazardous substances are required for mining and processing activities. – Bulk fuel may be required for onsite for refuelling the mining fleet. – Consumer installation certificates are required for bulk fuel storage and dispensing. – Hazardous reagents will be used within the extraction and processing plant

2 APPROACH TO THE ASSESSMENT

2.1 PURPOSED AND SCOPE OF THE ASSESSMENT

The aim of this assessment is to determine which impacts are likely to be significant. The available data is scoped out to identify any gaps that need to be filled, this enables us to determine the spatial and temporal scope; and to identify the assessment methodology that should be used.

2.2 THE ASSESSMENT PROCESS

The ESIA methodology applied to this assessment has been developed using the International Finance Corporation (IFC) standards and models, in particular, Performance Standard 1: 'Assessment and management of environmental and social risks and impacts' (International Finance Corporation, 2012 and 2017); Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008); international and national best practice guidelines; and ECC's combined relevant ESIA experience.

Furthermore, this assessment was undertaken for the Proponent in accordance with Namibian legal requirements.

This assessment is a formal process. The potential effects that the Project will have on the biophysical, social, and economic environments are identified, assessed, and reported so that the significance of potential impacts can be taken into account when considering a record of decision for the proposed Project.

Final mitigation measures and recommendations are based on the cumulative experience of the consulting team and the client, taking into consideration the potential environmental and social impacts. The process followed, through the assessment, is illustrated in Figure 2, and is detailed further in the following sections.

2.3 PROJECT LOCATION

The Project is located 15 km north of the town of Rosh Pinah, in the Oranjemund Constituency of the Karas Region in southern Namibia. The town of Rosh Pinah lies along a major tourism route within the Ai-Ais Richtersveld Transfrontier Park. The town is also a host to many employees of both RPZC and SZM and many private businesses.

The nearest commercial airport is located at Oranjemund, approximately 105 km southeast of Rosh Pinah, via a tar road C13. Aus, the nearest railhead on the Lüderitz - Keetmanshoop line, is accessed by a 165 km paved road.

1. Project screening	2. Establishing the assessment scope	3. Baseline studies
Complete	In Progress	In Progress
<p>The first stages in the ESIA process are to undertake a screening exercise to determine whether the Project triggers listed activities under the Environmental Management Act, 2007, and its regulations. The screening phase of the Project is a preliminary analysis, in order to determine ways in which the Project might interact with the biophysical, social, and economic environments.</p> <p>Stakeholder engagement:</p> <ul style="list-style-type: none"> • Registration of the project • Preparation of the BID 	<p>Where an ESIA is required, the second stage is to scope the assessment. The main aim of this stage is to determine which impacts are likely to be significant; to scope the available data and any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology.</p> <p>The scope of this assessment was determined through undertaking a preliminary assessment of the proposed Project against the receiving environment. Feedback from consultation with the public and the Proponent informs this process. The following environmental and social topics were scoped into the assessment, as there was the potential for significant impacts to occur. Impacts that are identified as potentially significant during the screening and scoping phase are taken forward for further assessment in the ESIA process. These are:</p> <p>SOCIOECONOMIC ENVIRONMENT</p> <ul style="list-style-type: none"> • Employment • Local businesses • Visual impacts on sense of place <p>BIOPHYSICAL ENVIRONMENT</p> <ul style="list-style-type: none"> • Noise and air quality, including dust emissions • Surface and groundwater • Heritage and culture • Biodiversity and • Road traffic <p>The following topics were scoped out of the ESIA, and they are therefore not discussed further in this report.</p> <ul style="list-style-type: none"> • An assessment of safety impacts or risks associated with developing the mine are not included within the scope of this assessment and will be addressed by the Proponent in a site-specific safety management plan. 	<p>A robust baseline is required, in order to provide a reference point against which any future changes associated with a Project can be assessed, and to allow suitable mitigation and monitoring to be identified.</p> <p>The region and general area have been studied for various projects and assessments. This literature was available to be referenced. The Project site-specific area has been studied as part of the ESIA process, and the following has been conducted as part of this assessment:</p> <ul style="list-style-type: none"> • Field surveys • Desktop studies • Consultation with stakeholders • Specialist field visits, and ongoing studies <p>The environmental and social baselines are provided in this scoping study.</p>

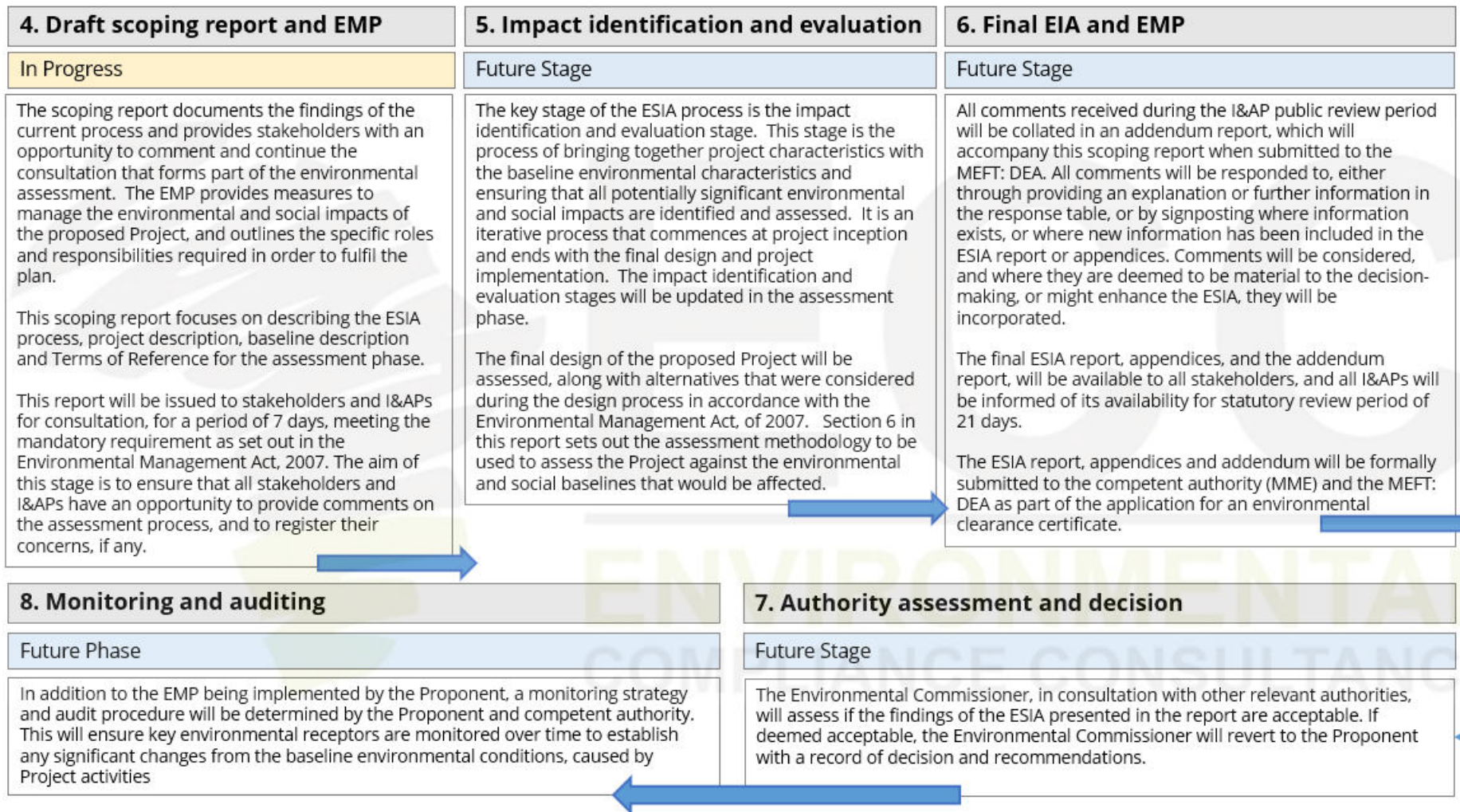


Figure 2 - ESIA process and stages complete.

2.4 STUDY AREA

This EIA study area has been defined according to the geographic scope of the receiving environment and potential impacts that could arise because of the proposed Project within that area. The receiving environment is a summary term for the biophysical and socioeconomic environment that is described in the baseline chapter. The study area extends beyond the mining licence boundary and includes the nearby receptors such as neighbouring farms and the town of Rosh Pinah.

2.5 PUBLIC CONSULTATION

Public participation and consultation are a requirement stipulated in Section 21 of the Environmental Management Act, 2007 and its regulations, for a project that requires an environmental clearance certificate. Consultation is a compulsory and critical component of the ESIA process for achieving transparent decision-making and can provide many benefits. Consultation is ongoing during the ESIA process.

The objectives of the public participation and consultation process are to:

- Provide information on the Project, and introduce the overall Project concept and plan in the form of a background information document (BID) (Appendix B)
- Determine the relevant government, regional and local regulating authorities
- Listen to and understand community issues, record concerns, and questions
- Explain the process of the ESIA and timeframes involved
- Establish a platform for ongoing consultation

Public consultation for the Project commenced on the 21st of February 2023. Adverts were published in the newspaper announcing the dates of the public meetings and encouraging members of the public to sign up as an I&AP for the Project.

The adverts for these public meetings were published in newspapers and the notification of the assessment in terms Regulation 21 of the Act was placed in the following newspapers on the 21 February 2023 and 28 February 2023:

- The Republikein;
- The Namibian Sun; and
- The Allgemeine Zeitung.

Public meetings were then subsequently held in Windhoek at the Namibian Scientific Society on the 28th of February 2023 and at the Rosh Pinah Community Hall on the 2nd of March 2023. The records of the public consultation process in the form of a summary report are provided in Appendix B and provides the current list of I&APs, evidence of consultation, including minutes of public meetings, advertisements in national newspapers, and a summary of the comments or questions raised by the public.

2.6 IDENTIFICATION OF KEY STAKEHOLDERS AND INTERESTED AND AFFECTED PARTIES

A stakeholder mapping exercise see Figure 3, was undertaken to identify individual or groups of stakeholders, and the method in which they will be engaged during the ESIA process. Stakeholders were approached through direct communication (letters and phone calls), the national press, site notices, or directly by email. The list of stakeholders is included in Appendix B.

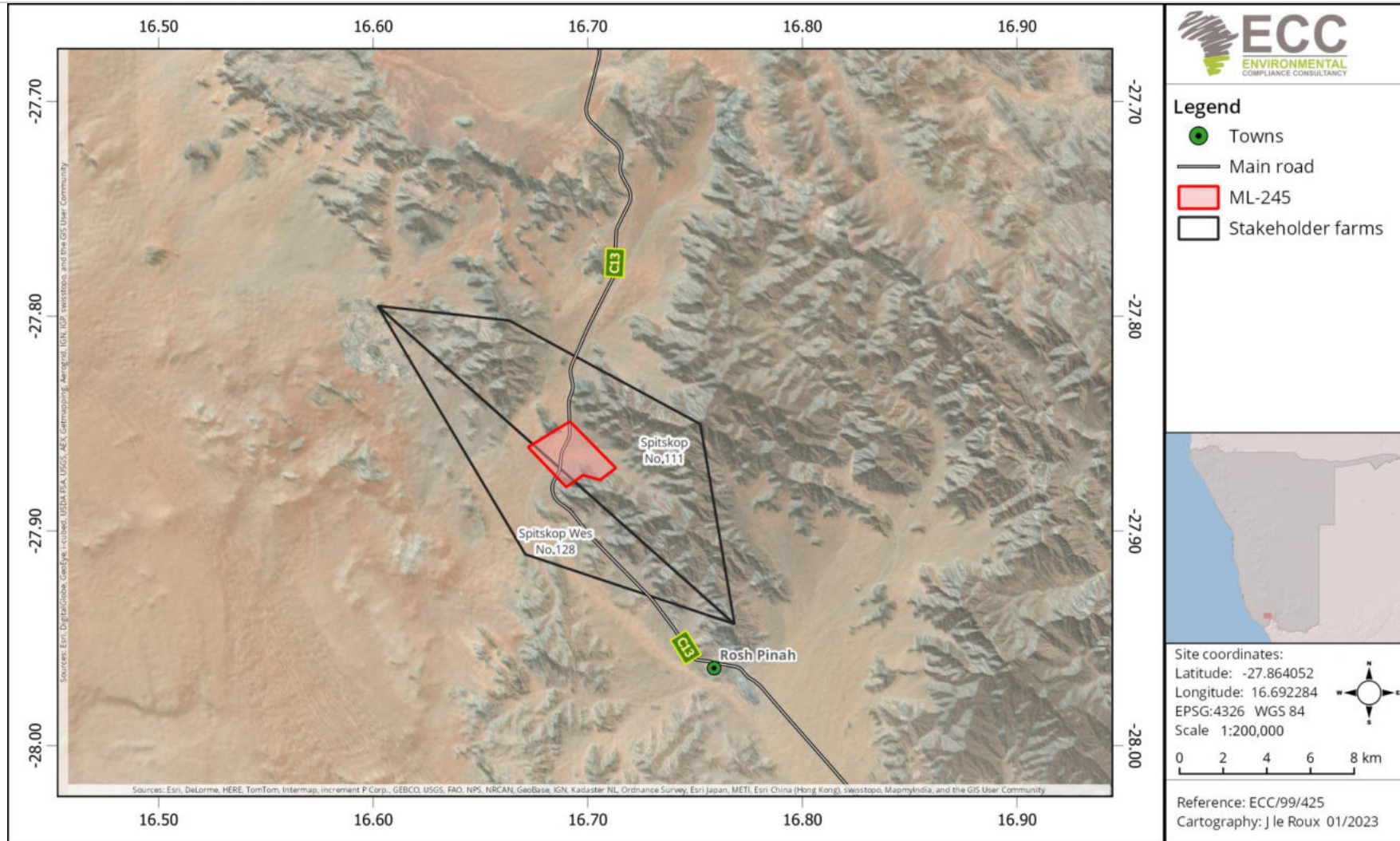


Figure 3 - Stakeholder map

A summarised list of stakeholders that were engaged during the public consultation process is given below:

- Directly and indirectly affected landholders
- The general public with an interest in the Project
- Ministry of Environment, Forestry and Tourism (MEFT)
- Ministry of Agriculture, Water and Land Reform (MAWLR)
- Ministry of Mines and Energy (MME)
- National Heritage Council (NHC)
- Ministry of Works and Transport (MWT) and the Roads Authority
- //Kharas Regional Council
- Rosh Pinah Town Council
- Roads Authority
- RoshSkor
- Rosh Pinah Schools
- Town residents and business owners
- NamWater and NamPower
- Rosh Pinah Zinc Mine
- Skorpion Zinc Mine

Appendix B provides a list of interested and affected parties, evidence of consultation, including notices of advertisements in national newspapers, minutes of public meetings, and a summary of the comments or questions raised by the public.

3 REVIEW OF THE LEGAL ENVIRONMENT

3.1 RELEVANT NATIONAL LEGISLATION

This chapter outlines the regulatory framework applicable to the proposed Project. As stated in Section 1, environmental clearance is required for any activity listed in the Government Notice No. 29 of 2012 of the EMA. The Proponent holds several current and valid environmental clearance certificates for the exploration phase of the Project.

The Project area is located outside of any national parks, heritage-listed areas, or areas of significance. The Project area is not located within a groundwater-controlled area, as regulated under the Water Management Act of 1956.

A thorough review of relevant legislation has been conducted for the proposed Project. Table 3 below identifies relevant legal requirements specific to the Project.

Table 4 provides the national policies and plan and Table 5 lists specific permits for the Project.

3.2 RELEVANT NATIONAL POLICIES AND PLANS

Table 3 - Details of the regulatory framework as it applied to the Gergarub Project

NATIONAL REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY TO THE PROJECT
Constitution of the Republic of Namibia (1990)	<p>The constitution defines the country's position in relation to sustainable development and environmental management.</p> <p>The constitution refers that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at the following: "Maintenance of ecosystems, essential ecological processes and biological diversity of Namibia, and the utilisation of living, natural resources on a sustainable basis for the benefit of all Namibians, both present, and future."</p>	<p>The Gergarub Project is committed to the sustainable use of the environment, and has aligned its corporate mission, vision, and objectives within the ambit of the Constitution of the Republic of Namibia (1990).</p>
Minerals (Prospecting and Mining) Act No. 33 of 1992	<p>The Act provides for the granting of various licences related to mining and exploration.</p> <p>Section 50 (i) requires: "An environmental impact assessment indicating the extent of any pollution of the environment before any prospecting operations or mining operations are being carried out, and an estimate of any pollution, if any, likely to be caused by such prospecting operations or mining operations."</p>	<p>The proposed mining activity requires an EIA to be carried out, as it triggers listed activities in the Environmental Management Act's regulations.</p> <p>Mining activities shall not commence until all conditions in the Act are met, which includes an agreement with the landowners</p>

NATIONAL REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY TO THE PROJECT
	<p>The Act sets out the requirements associated with licence terms and conditions, such that the holder of a mineral licence shall comply with.</p> <p>The Act also contains relevant provisions for pollution control related to mining activities and land access agreements and provides provisions that mineral licence holders are liable for any damage to land, water, plant, or animal life, caused by spilling or pollution, and must take all such steps as may be necessary to remedy such spilling, pollution, loss, or damage, at its own costs.</p>	<p>and conditions of compensation, if applicable.</p> <p>The Project shall be compliant with Section 76 of the Act with regard to records, maps, plans and financial statements, information, reports, and returns submitted.</p>
<p>Environmental Management Act, 2007 (Act No. 7 of 2007) and its regulations, including the Environmental Impact Assessment Regulation,</p>	<p>The Act aims to promote sustainable management of the environment and use of natural resources. The Act requires certain activities to obtain an environmental clearance certificate prior to Project development.</p> <p>The Act states that an EIA should be undertaken and submitted as part of the environmental clearance certificate application process.</p> <p>The MEFT is responsible for the protection and management of Namibia's natural environment. The</p>	<p>This environmental scoping report documents the findings of the scoping phase of the environmental assessment undertaken for the proposed Project.</p> <p>The process has been undertaken in line with the requirements under the Act and its regulations.</p>

NATIONAL REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY TO THE PROJECT
2007 (No. 30 of 2011)	Department of Environmental Affairs, under the MEFT, is responsible for the administration of the EIA process.	
Water Act, 1956 (Act No. 54 of 1956)	<p>Although the Water Resources Management Act (No. 11 of 2013), has been billed, but not promulgated, it cannot be enacted, as the regulations have not been passed – therefore the Water Act of 1956 remains the current piece of legislation relating to water management in Namibia.</p> <p>This Act provides for the control, conservation and use of water for domestic, agricultural, urban, and industrial purposes; and to make provision for the control of certain activities on or in water.</p> <p>The Department of Water Affairs, within the Ministry of Agriculture, Water and Land Reform (MAWLR), is responsible for the administration of the Act.</p>	<p>The Act stipulates obligations to prevent the pollution of water.</p> <p>Measures to minimise potential surface and groundwater pollution are contained in the EMP.</p> <p>The Project is obliged to have all permits relevant to its operations under this Act.</p> <p>Abstraction of water from boreholes requires an abstraction permit to be obtained from the Ministry of Agriculture, Water and Land Reform.</p>

NATIONAL REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY TO THE PROJECT
Soil Conservation Act, No. 76 of 1969	This Act makes provision for the prevention and control of soil erosion, and for the protection, improvement, and conservation of soil and vegetation.	<p>Land clearing is an unavoidable necessity for the proposed Project, as large areas will be cleared for mining infrastructure.</p> <p>Measures will be included in the EMP to conserve soil and vegetation that will be used as part of the rehabilitation phase of the Project.</p>
The Forestry Act, No. 12 of 2001 as amended by the Forest Amendment Act, No. 13 of 2005	<p>Section 22 deals with the protection of natural vegetation that is not part of the surveyed erven of a local authority area as defined.</p> <p>Section 21 states that no person shall cut, destroy, or remove vegetation that is growing within 100 metres of a river, stream, or watercourse.</p> <p>Section 23 requires a permit from the Director for the clearance of vegetation on more than 15 ha on any piece of land or several pieces of land situated in the same locality as that which has predominantly woody vegetation; or cut or remove more than 500 cubic metres of forest produce from any piece of land in a period of one year.</p>	<p>The Project activities will require vegetation clearing.</p> <p>The Proponent will ensure that all required permits are in place before vegetation removal commences.</p>

NATIONAL REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY TO THE PROJECT
National Heritage Act, No. 27 of 2004.	<p>The Act provides provision for the protection and conservation of places and objects with heritage significance.</p> <p>Section 55 compels mining companies to report any archaeological findings to the National Heritage Council.</p> <p>Subsection 9 allows the NHC to issue a consent, subject to any conditions that the Council deems necessary.</p>	<p>There is the potential for heritage related objects to be found in the mining licence area. Therefore, the relevant stipulations in the Act will be taken into consideration and incorporated into the EMP.</p> <p>In cases where heritage sites are discovered, the 'chance find procedure' will be used.</p>
Labour Act, No. 11 of 2007	<p>The Labour Act, No. 11 of 2007 (Regulations relating to the Occupational Health & Safety provisions of Employees at Work, promulgated in terms of Section 101 of the Labour Act, No. 6 of 1992 - GN156, GG 1617 of 1 August 1997)</p>	<p>The Project shall adhere to all labour provisions and guidelines, as enshrined in the Labour Act.</p> <p>The Project shall also develop and implement a comprehensive occupational health and safety plan to ensure adequate protection for its personnel throughout the Project lifecycle.</p>
Road Traffic and Transport Act, No. 22 of 1999	<p>This Act makes provision for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, and the control and regulation of road transport users across Namibia.</p>	<p>The Project will involve transportation activities in support of mining activities.</p> <p>The employees and support business shall adhere to national road regulations on public roads.</p>

NATIONAL REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY TO THE PROJECT
		The Proponent will ensure that the diversion of the C13 road will be conducted in compliance with the Act.
Hazardous Substances Ordinance, No. 14 of 1974	<p>This Ordinance provides for the control of toxic substances and can be applied in conjunction with the Atmospheric Pollution Prevention Ordinance, No. 11 of 1976.</p> <p>This applies to the manufacture, sale, use, disposal, and dumping of hazardous substances, as well as their import and export.</p>	<p>The planned Project will involve the handling and storage of hazardous substances such as fuels, reagents, and industrial chemicals. The Proponent shall ensure safe handling, transfer, storage, and disposal protocols are developed, implemented, and audited throughout its operations.</p> <p>The Proponent is obliged to ensure that all permits under this Ordinance are obtained prior to Project commencement.</p>
Civil Aviation Act, No. 6 of 2016	Section 55 of the regulations relates to safety and security protocols near aerodromes.	The Project is located in proximity to the military air base, and as such, the Proponent will ensure that all regulations regarding safety and security near aerodromes is complied with.
The Atmospheric Pollution Prevention Ordinance, No. 11 of 1976	The Ordinance pertains to the prevention of air pollution, with particular focus on public health, and contains detailed provisions on air pollution matters, including the control of noxious or offensive gases, atmospheric	The nature of mining activities generates dust. Activities within the mining operations and processing plant will generate gases, odours, and air pollution. The Proponent

NATIONAL REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY TO THE PROJECT
	pollution by smoke, dust control, motor vehicle emissions, and other general provisions.	will ensure that all measures reasonably practicable will be implemented to reduce and mitigate impacts to air quality, and this will be included in the EMP.

Table 4 - Namibian national policies and plans applicable to the Gergarub Project

Policy or plan	Description	Relevance to the Project
Vision 2030	<p>Vision 2030 sets out the nation’s development targets and strategies to achieve its national objectives.</p> <p>Vision 2030 states that the overall goal is to improve the quality of life of the Namibian people aligned with the developed world.</p>	The proposed Project shall aim to meet the objectives of Vision 2030 and shall contribute to the overall development of the country through continued employment opportunities and ongoing contributions to the gross domestic product (GDP).
Fifth National Development Plan (NDP5)	<p>The NDP5 is the fifth in a series of seven five-year national development plans that outline the objectives and aspiration of Namibia’s long-term vision.</p> <p>The NDP5 pillars are economic progression, social transformation, environmental sustainability, and good governance.</p>	The planned Project supports meeting the objectives of the NDP5 through creating opportunities for continued employment.
The Harambee Prosperity Plan ii (2021 – 2025)	Second Pillar: Economic advancement – ensuring increasing productivity of priority key sectors (including mining) and the development of additional engines of growth, such as new employment opportunities.	The Project will contribute to the continued advancement of the mining industry and create an additional employment generation engine within the regional and national landscape.

Policy or plan	Description	Relevance to the Project
Minerals Policy	<p>The Minerals Policy was adopted in 2002 and sets guiding principles and direction for the development of the Namibian mining sector, while communicating the values of the Namibian people.</p> <p>The policy strives to create an enabling environment for local and foreign investments in the mining sector and seeks to maximise the benefits for the Namibian people from the mining sector, while encouraging local participation.</p> <p>The objectives of the Minerals Policy are in line with the objectives of the Fifth National Development Plan that includes the reduction of poverty, employment creation, and economic empowerment in Namibia.</p>	<p>The planned Project conforms to the Policy, which has been considered through the ESIA process and the production of this report.</p> <p>The Proponent intends to continue to support local spending and procurement.</p> <p>The Project will comply with the general guidelines of the Policy through the adoption of various legal mechanisms to manage all aspects of the environment effectively and sustainably from the start. The ESIA is one such mechanism to ensure environmental integrity throughout the planned Project's lifecycle.</p>

Table 5 - Permits and licences required for the Gergarub project

Permit or licence	Act / Regulation	Related activities requiring permits	Relevant Authority
Environmental clearance certificate	Environmental Management Act, No. 7 of 2007	Required for all listed activities shown in Table 2.	Ministry of Environment, Forestry and Tourism (MEFT)
Mining licence	Section 90 (2) (A) of the Minerals Act, No. 33 of 1992	Written permission from the mining commissioner.	Ministry of Mines and Energy (MME)
Surface rights agreements (mine, infrastructure corridors)	Section 52(1)(A) of the Minerals Act, No. 33 of 1992	Included in the mining license application. Signed by the farmer, Trevali, awaiting final signatures from	Ministry of Mines and Energy (MME)

Permit or licence	Act / Regulation	Related activities requiring permits	Relevant Authority
		Vedanta	
Permission to extract water from Orange River (Namwater)	A permit is issued under the Water Act, No. 54 Of 1956 (enforced)	Required to meet water requirements for mining and processing.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Tailings waste disposal permit	A permit is issued under the Water Act, No. 54 of 1956 (enforced)	Required for the disposal of tailings.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Wastewater discharge permit	A permit is issued under the Water Act, No. 54 Of 1956 (enforced) but form types that fall under the Water Act, No. 24 of 2004 are used.	Required for discharge of sewage and/or excess industrial or mine wastewater.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Permit for the clearing of land	The Forest Act, 2001 (Act No. 12 of 2001)	This Act governs the removal of vegetation within 100 m of a water course, or removal of more than 15ha of woody vegetation, or the removal of any protected plant species.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Permit for the destruction of heritage objects and artefacts	The Heritage Act, No. 27 of 2004.	This Act relates to interference with heritage artefacts during the Project life. Heritage sites could potentially be located within the proposed mining licence footprint, or along proposed pipeline or powerline routes.	National Heritage Council (NHC)
Application for power connection	Electricity Act 4 of 2007	The mine will require power to be supplied to them by NamPower.	Namibian Power Corporation (NamPower)

Permit or licence	Act / Regulation	Related activities requiring permits	Relevant Authority
Consumer installation certificate for bulk fuel storage	Petroleum Products Regulations	A consumer installation certificate is required for bulk fuel storage and dispensing.	Ministry of Mines and Energy (MME)
Licence for explosives magazine	Minerals (Prospecting and Mining) Act, No. 33 of 1992; Mine Safety Regulations	This is also covered under the accessory works application.	Ministry of Mines and Energy (MME)
Permit for the storage and use of explosives, and the burning of packaging	Minerals (Prospecting and Mining) Act, No. 33 of 1992; Mine Safety Regulations	Necessary for explosives and blasting.	Ministry of Mines and Energy (MME)

4 PROJECT DESCRIPTION

4.1 COMPANY BACKGROUND

Gergarub Mining and Exploration (Pty) Ltd owns the Gergarub project (Project), a joint venture agreement between Vedanta Zinc International (51 %), via its Namibian subsidiary Skorpion Zinc Mine, and Rosh Pinah Zinc Corporation, or Rosh Pinah (49 %) (JV).

4.2 NEED FOR THE PROJECT

New mining activities contribute to the national and local economies and may have a long-lasting and positive impact on the country's economy. Namibia's economy depends largely on mining. With an economically viable and approved, fully developed Gergarub Zinc Project, the Namibian economy can expect benefits from revenues during the construction phase, royalties and taxes during the life of mine (LoM), and a positive contribution towards employment. Based on current mine plans, between 300 and 350 people will be employed during expansion construction, and a total of approximately 700 to 800 for the operational phase, providing jobs and livelihoods for them and their families, and local and national service and supply contractors for a minimum of 12 to 15 years.

Gergarub has selected a mining strategy which will contribute the following estimates to the Namibian finances:

- USD 1.95 billion in foreign revenue into Namibia
- USD 224 million in corporate income tax
- USD 42 million in royalties
- USD 14 million in export levies

4.3 EMPLOYMENT

During operations, it is expected that the split for the mining department labour requirement will be as noted below. A detailed labour plan covering all components and departments of the operation will be further developed as the project evolves. The labour compliment for the mining development and early operations comprises of the following:

- 24 Management and technical teams
- 195 Mining operations crews
- 77 Maintenance crews

The labour requirement for operations over the LoM ranges from 700 to 800 employees (550) and contractors (250), although optimization studies are being further produced to better define the labour force. The labour force will be comprised of local workers, including those retrenched by Skorpion. Most people would reside in Rosh Pinah and others would supplement and be accommodated in short-term housing such as guest houses and hostel style lodging. Some of the

management and technical team would be from South Africa or other experienced locations, Namibian and regional as much as possible.

4.4 PROJECT BACKGROUND AND EXPLORATION HISTORY

The Proponent holds EPLs, MDRLs, and MLs in Namibia; those relevant to the Gergarub Zinc Project. The project is located on farm Spitskop 111, along the C13 road between Rosh Pinah and Aus within the Oranjemund constituency, and approximately 10 km southeast of the Skorpion Zinc Mine and 15 km northwest of the Rosh Pinah (Gergarub Project) Mine, on MDRL 2616. As early as May 1963, M.D. McMillan commenced mapping the Witputs – Sendelingsdrif area as part of his Ph.D. study at the Precambrian Research Unit at the University of Cape Town and collected rock samples. The weight of the samples indicated the presence of barite (barium sulphate). On further investigation McMillan came upon a rock outcrop stained green by copper oxides, which can be considered as the discovery of the Rosh Pinah deposit. In December 1964, McMillan mapped the outcropping gossans. The assay results returned economic grades of zinc and lead.

Parts of the Project area were explored historically by Anglo American and Bafex Exploration starting in 2008, prior to The Proponent. The Proponent has actively and systematically explored the Project area since 2016, using a variety of exploration methodologies, including, but not limited to, geochemical surveys, soil sampling, limited trenching, and drilling (RAB, RC and diamond drilling) techniques. (CSA Global, 2021). Within formations of nearby similar geology, and since commencing mining operations in 1969 to the end of 2020, a total of 29 million tonnes have been mined from the various lenses of Rosh Pinah. The average annual production over the last 20 years is approximately 650,000 tpa (Figure 4).

Since the discovery of the Rosh Pinah mine, ongoing in-mine exploration continues to play a significant role in extending the LOM. The discovery of the Western Orefield 3 (WF3) zone has extended the current LOM and further deep-seated mineralization has potential to increase the life of operations far beyond the current LOM. This experience has helped with exploration and feasibility investigations at Gergarub since its discovery in 2008. The 2022 optimization study by AMC has defined 11 years life of mine, and 10.1 Mt reserve at 1Mtpa production rates and NSR cut-off of US\$100/t. The 2022 focus on the regional exploration potential on MDRL 2616, is to further investigate and target the geophysical targets superconducting quantum interference device electromagnetic and Versatile Time Domain Electromagnetic (SQUID EM and VTEM) with the aim of extending mineralization in the north-east as well as testing the down dip of the main ore lenses in the west of the deposit.

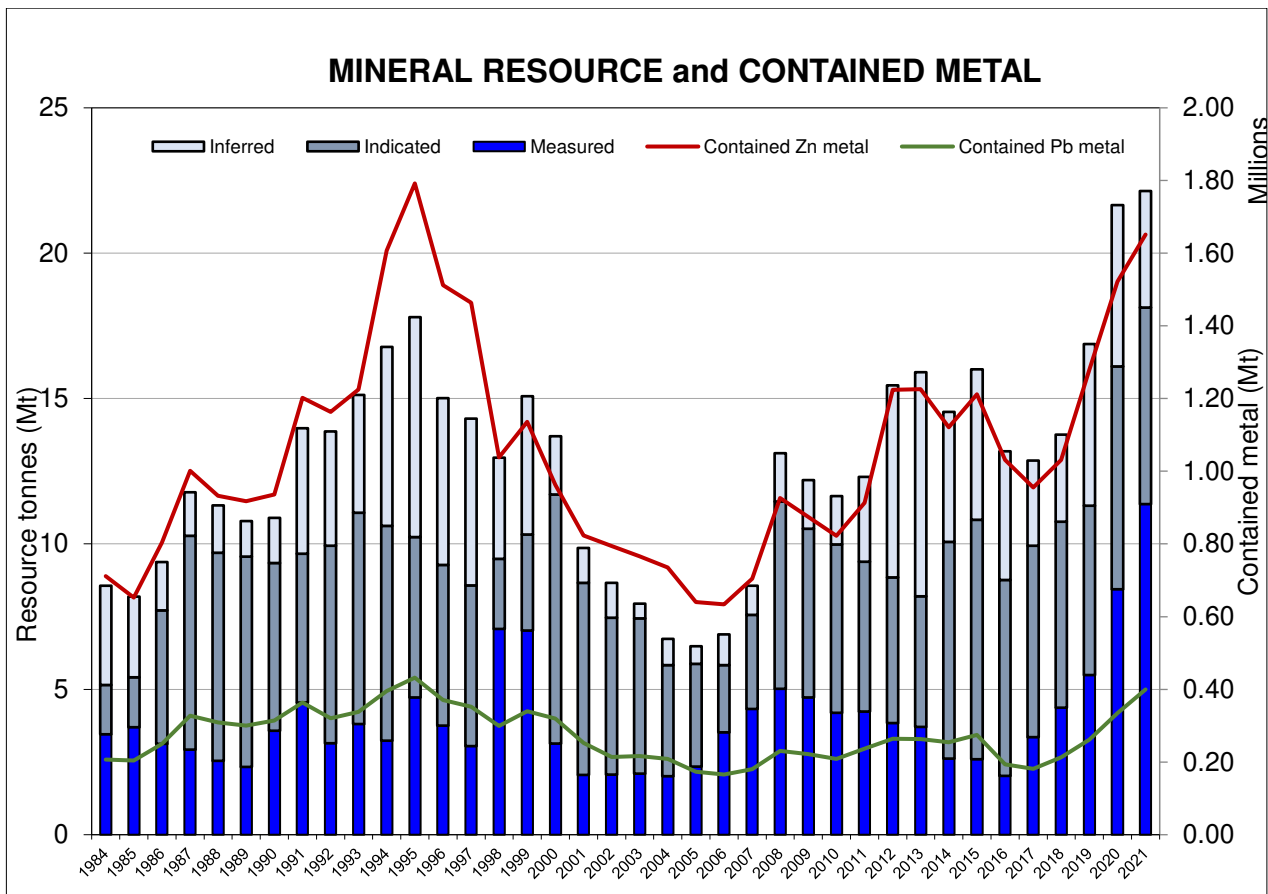


Figure 4 - History of resources and contained metal of the nearby Rosh Pinah Mine

4.5 GEOLOGY AND MINERALIZATION

The Gergarub deposit is hosted within the Gariep Belt, which extends from north-western South Africa into southern Namibia. The following geology and mineralization description is based on the Technical Report of the Gergarub Deposit, 2022, Rosh Pinah Zinc and Skorpion Zinc Mine. The Gariep Belt is situated between the Kalahari- and Rio del Plata Cratons, part of the spreading of the Adamastor Ocean. It consists of metamorphosed fill of the Gariep basin, one of a number of Neoproterozoic basins that evolved around the margins of the Kalahari Craton as a consequence of the break-up of a 1.0 Ga supercontinent.

The external part of the belt, furthest east, is called the Port Nolloth Zone (PNZ), approximately 770-550 MA years old. This zone consists of continental sedimentary successions with subordinate volcanic rocks as described above. The PNZ can be interpreted as three mega-sequences:

- Continental rift deposits (Stinkfontein Subgroup)
- Passive margin deposits (Hilda Subgroup)
- Syn-orogenic deposits (Holgat Formation)

The Gergarub Deposit is situated within the PNZ, more specifically, within the Rosh Pinah Formation of the Port Nolloth Group. The Rosh Pinah Formation hosts two major producing base metal mines as well as many other mineral showings. Structurally, the deposit is situated within a

failed graben Easton the eastern margin of the Gariiep Basin. The graben developed during the rifting phase and was subsequently filled by the bimodal volcanism associated with the transition from rifting to drifting, as well as lacustrine- and alluvial facies sediments. Subsequently, these deposits were exposed to extreme ductile- and brittle deformation produced by the Gariiep Orogeny (~545 Ma) which results in recumbent folding, shearing and thrusting. The Gergarub deposit is covered by 30 - 100 m of Tertiary overburden.

There is a distinction between concordant mineralization and discordant mineralization. Concordant ore is in-situ sediment-hosted and rhyolite- or rhyolitic hyaloclastic-hosted mineralization that formed syngenetically on or just below the seafloor. The mineralization occurs in chemically reducing environments together with small scale tectonic features indicating the exhalation of the hydrothermal fluids and precipitation of sulphides and chert onto the seafloor. Discordant ore has been transported as debris-flow and deposited within brecciated lithified volcanic and sedimentary rocks. Mass flow breccias in sulphide ore occur which indicates that these have been re-deposited together with fragments of host rocks. Some rhyolite-hosted mineralization occurs in veins and breccias as stock work feeder zones.

The mineralization is closely associated with the rhyolites, specifically rhyolite domes. There are three main mineralization types:

1. The first type is disseminated mineralization with typical values of <20% sulphides with zinc grades from 2%-6% zinc. Generally, the zinc is related to Fe-rich sphalerite which typically contains 10% iron.
2. The second main mineralization type is semi-massive sulphide which is banded mineralization with typically 20% to 50% sulphides with zinc grades from 4%-12% zinc. The sphalerite typically contains 2%-7% Fe.
3. The highest-grade mineralization is the massive sulphide with typically 50% to 100 % sulphides with zinc grades from 15%-45%. The massive sulphide mineralization commonly contains honey coloured sphalerite with less than 1% Fe, and chocolate- coloured sulphide which contain a higher percentage of iron.

All three types of mineralization are compositionally banded on a 1 – 10 mm scale, more so in disseminated and semi-massive ore which is intercalated with quartzite, metacarbonate, and Fe-sulphides (pyrite and pyrrhotite). All sulphides have been recrystallized, with very little effect on chemistry, due to the metamorphism which the deposit has undergone.

The final decision on the mining method would need to be further evaluated post the current data collection phase. Below is Table 6 summarizing the surface and underground production over LOM.

Table 6 - Gergarub concept study mine plan production potential (Million tonnes)

Mine section	Tonnage (Mt)	Commercial Operation
Underground Tonnes Mines	6.21	Year 2 to Year 10
Total Ore Mined	23.80	Over LOM

Source: Gergarub Stage 1 Concept Mine Plan July 2022, ABGM

4.6 PRELIMINARY SITE LAYOUT

An optimal site layout is based on designing the site around critical landform features such as topography and sensitive areas, while considering the efficiencies required for the mining operation. The proposed site layout is provided in Figure 5.

At this current stage the proponent has provided a preliminary layout which is subject to change. However, the assessment will be carried out subject to the current plans received from the proponent. After the assessment some facets of the site layout may need to change due to recommendations made observed from the proposed mitigation measures.

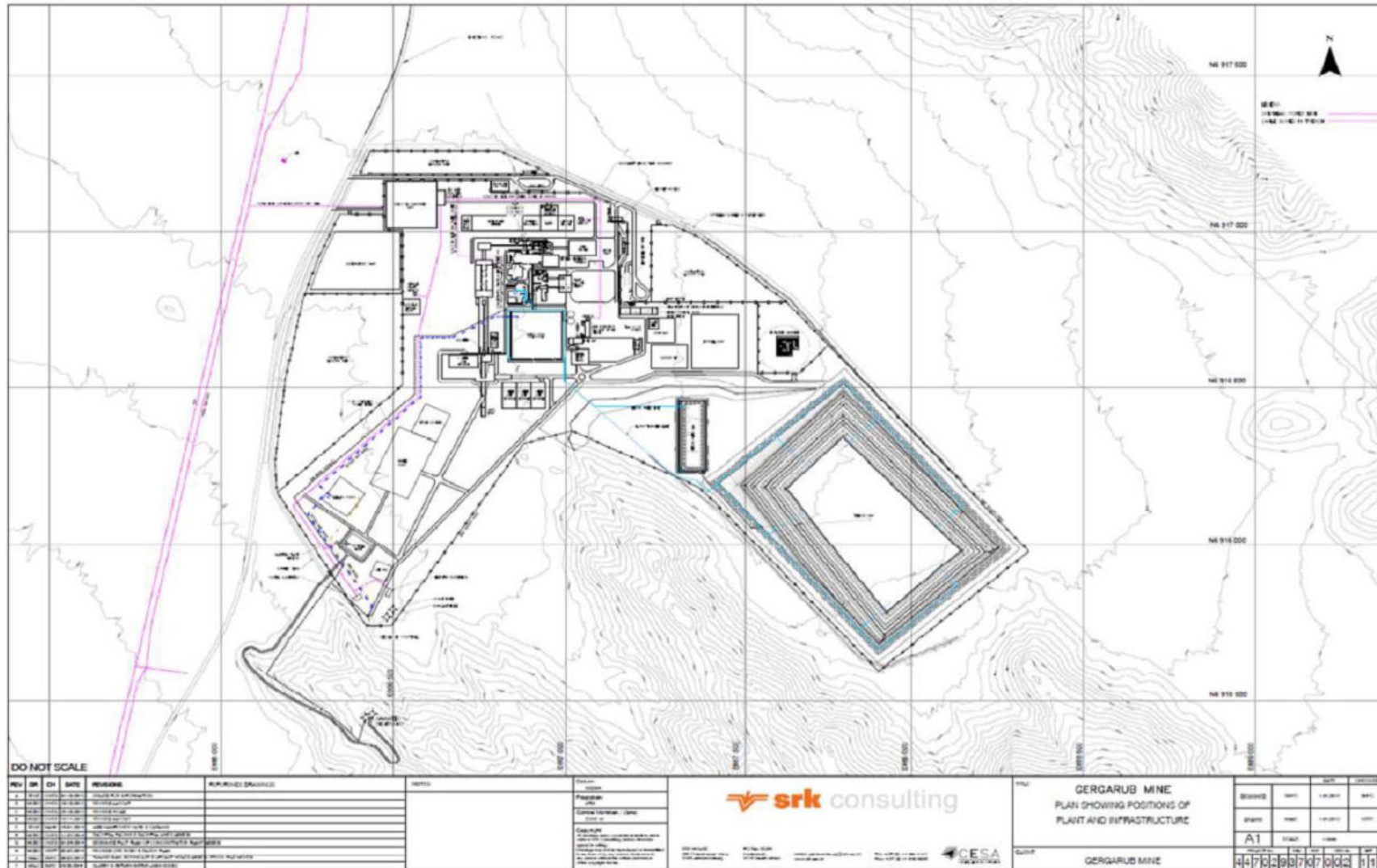


Figure 5 - Preliminary site layout, Gergarub Mine

The following items of infrastructure are shown on the site layout (Figure 6 and Figure 7):

- NamPower 66 kv/11 kv transformer and substation;
- perimeter and internal fencing;
- internal road networks;
- decline portal location and ventilation infrastructure;
- backfill plant;
- ROM pad with low-grade ore crushing and sorting plant;
- mine administration offices, including canteen and toilets;
- minor service workshop and stores;
- access control facility with bus stops and car parks;
- open mine pit;
- waste rock dump;
- stormwater diversion channel and catchment ponds;
- settling ponds for water from underground and open pit;
- process water storage for dust suppression;
- alternative routing of national road alignment;
- alternative routing of 66 kV power line alignment;
- 5 m contours.

In developing the site layout, cognisance has been taken of nature reserves, sensitive flora and other impacts to existing infrastructure.

4.7 OREBODY, MINING INFRASTRUCTURE AND SERVICES

SRK (2021) conducted a mining study as part of the project PEA and PFS. The following components are taken from their study and the *Gergarub Strategy Optimization Study* for Gergarub Mining and Exploration (Pty) Ltd by AMC Consultants, 2022, namely: orebody description, mining method and equipment, mine haulage and design, metallurgy and processing, support infrastructure and services and project infrastructure – general and support.

4.7.1 OREBODY

Gergarub is comprised of two distinct mining areas, with a total of six zones, with Ore Zone 5 (“OZ5”) being closest to surface and the other zones deeper and dipping at angles ranging from 26° to 45°. The orebody has a lateral/strike extent of 520 m with orebody thickness varying from 5 m to over 35 m in Ore Zones 0 to 4 (“OZ0-4”). Ore Zones 1 to 4 (“OZ1-4”) form a “layered” package that extends from approximately 100 m below surface to 500 m below surface and OZ5 is a separate folded body located approximately 450 m away from OZ1-4. It has highly variable geometry, a factor that influenced the mining methods, approach, and continue to influence the detailed designs.

The most recent The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral (SAMREC) Compliant Mineral Resource Estimate based on exploration conducted between 2008 and 2013. Total Mineral Resource of 18.1 Mt @ 8.7% Zn, 2.3% Pb and 735 g/t Ag was declared (inclusive of Inferred). The total Indicated Resources amounts to 11.4 Mt @ 9.1% Zn, 2.5% Pb and 493 g/t Ag.

The sulphides are typically comprised of:

- sphalerite,
- pyrite,
- galena and
- minor chalcopyrite

4.7.2 MINING METHOD AND EQUIPMENT

The mining method for Gergarub will be long hole open stope (LHOS) with backfill, mining stopes in an overhand (bottom-up) extraction sequence. LHOS will be supplemented with Drift and Fill (DAF) mining which will be used to mine the orebody extremities and maximize the overall recovery of the Mineral Resource.

Ore is sourced from five moderate to shallow-dipping mineralized ore zones (OZ), separated into two distinct mining areas, OZ1-4 and OZ5. OZ1-4 contains majority of the mining inventory ~81%, and will be prioritized as the primary mining area, OZ5 will be used to supplement production from OZ1-4 to ensure a sustained steady-state production profile of 1.0 Mtpa over the life of mine (LOM).

AMC's Hill of Value™ (HoV™) Strategy Optimization process was used to investigate potential preferred operating parameters for the Project's underground mine with the following results:

- Material above an NSR cut-off of US\$100/t for OZ1-4 and OZ5 can be considered strategically optimal to maximize the project value
- Steady-state ore production of 1.0 Mtpa can be achieved for 8 years of the 11-year LOM.
- Mining with backfill will significantly increase recovery of the available mining inventory, while decreasing the capacity of the tailings storage facility (TSF).
- Using truck haulage (up a 1 in 7 gradient decline) is best suited to the highly variable geometry of the orebody and the low production rate.

The proposed mining method with the inclusion of backfill has the advantages of higher ore production, improved local and regional ground stability, improved mining recovery, reduced dilution and reduced tailings being pumped to the TSF. Mining will progress, where practical, from the centre to the strike extents of each level in a bottom-up sequence. Each stope will be mined and backfilled before mining the next stope in the sequence.

Mineable Shape Optimizer (MSO) software was used to produce stope shapes (Figure 8 and Figure 9) Only stope shapes with an average NSR value greater than the strategic US\$100/t cut-off value were considered for the mine design. There are two main sources of dilution in the mining of open stopes:

1. Planned dilution, which is the dilution required to achieve a practical stope shape and can include waste to conform with the minimum mining width.
2. Unplanned dilution, which is the dilution that is outside of the planned stope shape and is predominantly due to overbreak associated with blasting practices and geotechnical conditions.

Due to inefficiencies in mining recovery from the stopes, small amounts of mineralized material may also be lost during the final stope cleanout, and additional minor losses may occur in transit from the stopes to the processing plant. Hence, a mining dilution and recovery factor was applied to account for these losses.

Access to OZ1-4 and OZ 5, would be via a single portal and split decline to access the two mining areas. The mine design is based on a typical underground layout with level access extending from the decline, which extend out to the level drives, level infrastructure (ventilation, dewatering, stockpiles, etc.) and production drives.

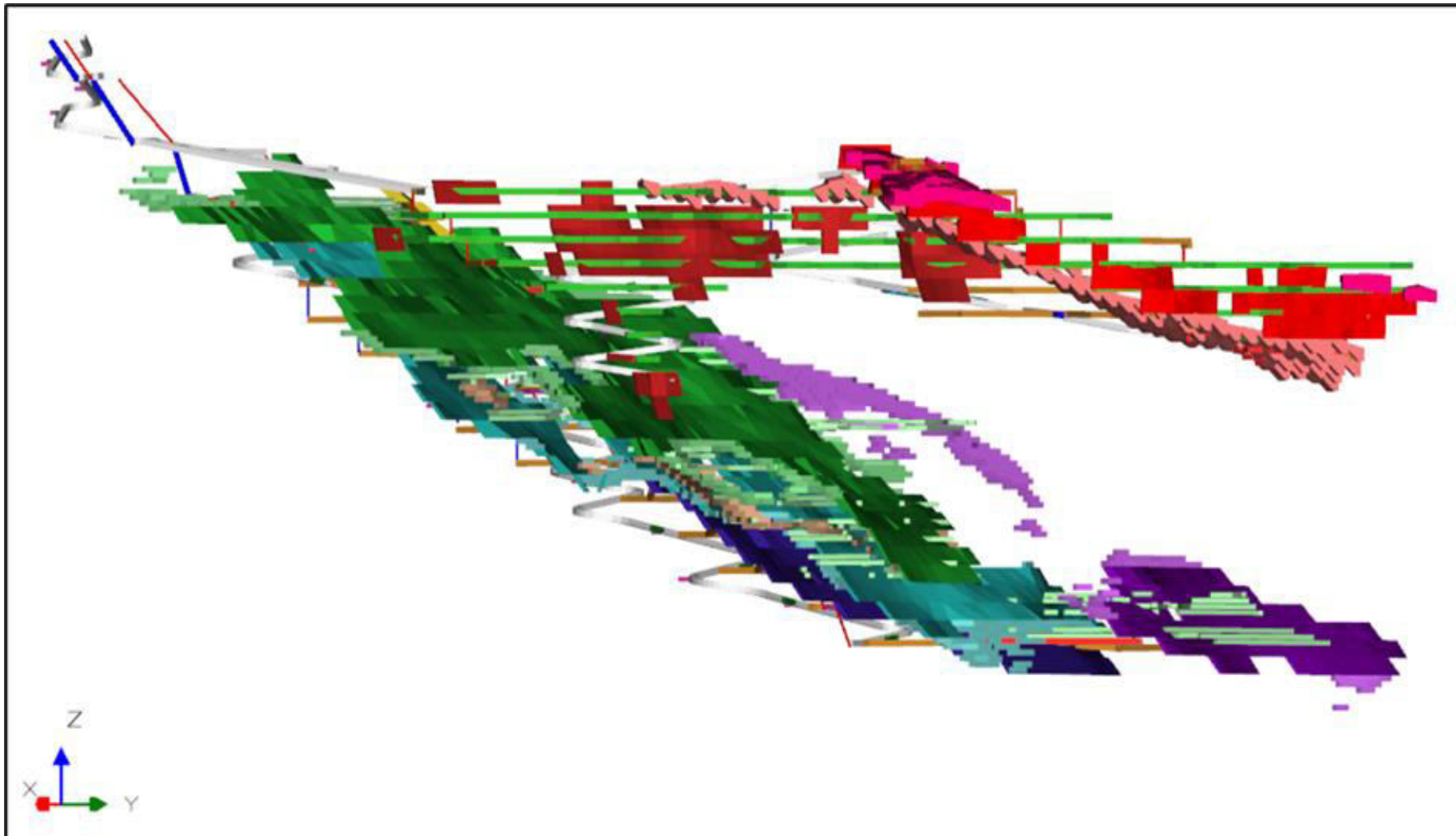


Figure 6 - 3-D view of Gergarub mine plan

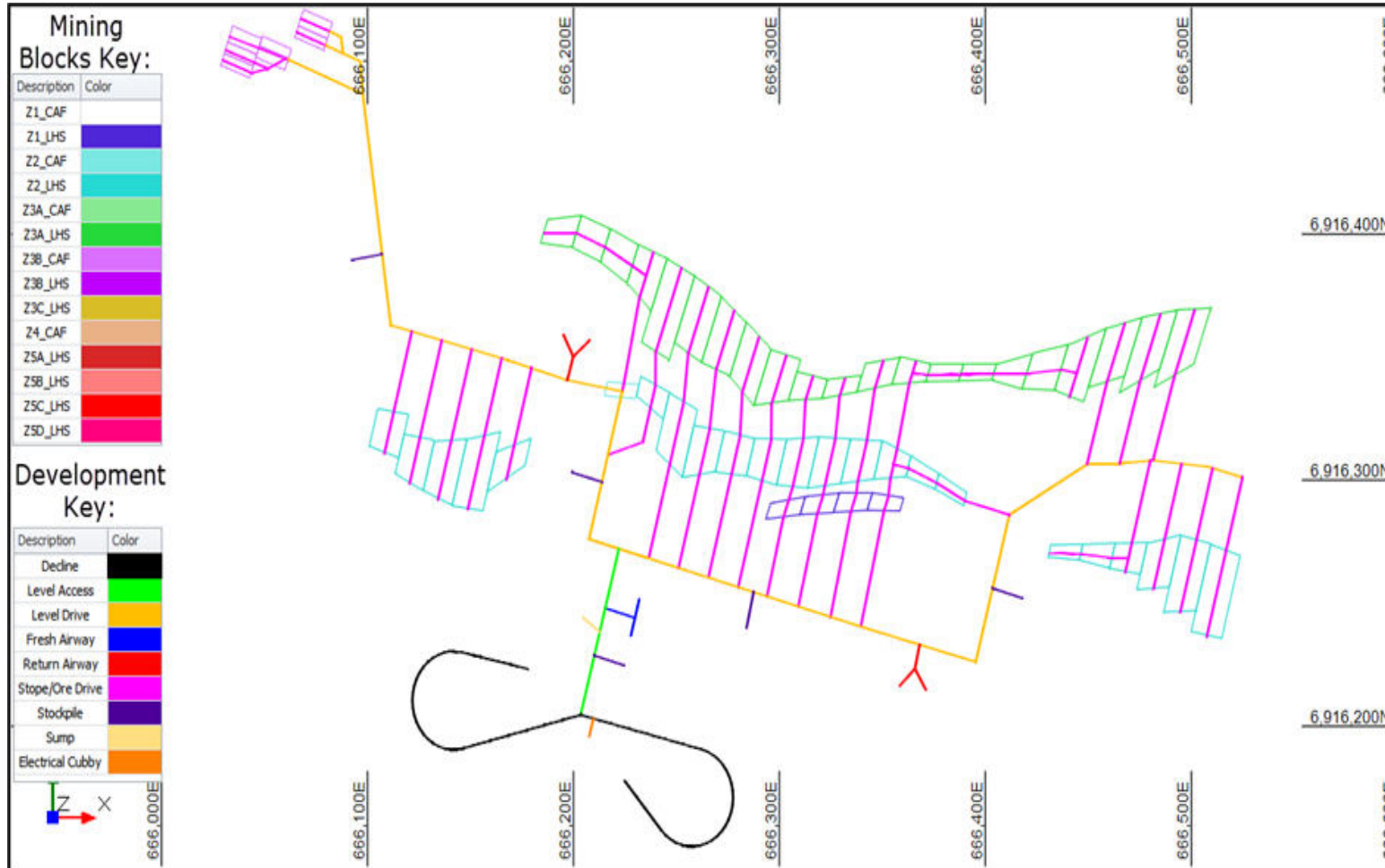


Figure 7 - Typical mine plan layout, Gergarub Mine

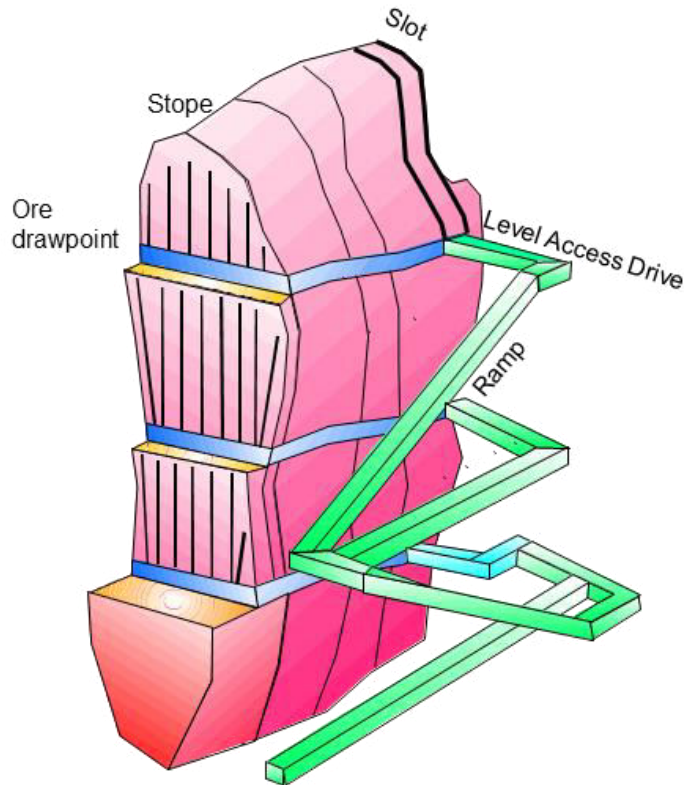


Figure 8 - Sub-level Open Stoping

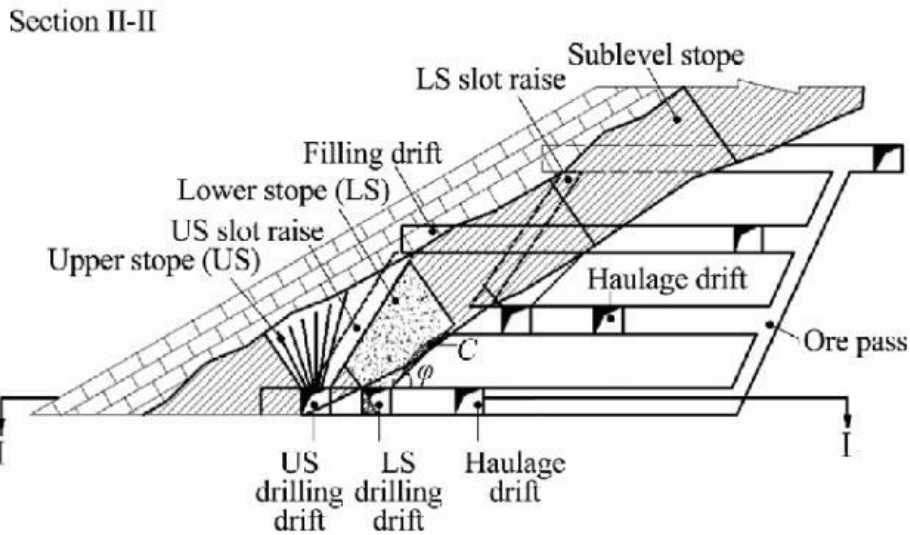


Figure 9 - Drift and fill

The dilution and mining recovery estimates applied within the mine design and schedule are below in Table 7.

Table 7 - Average dilution and mining recovery estimates

Mining method	Planned Dilution (%)	Unplanned Dilution (%)	Operational Dilution (%)	Mining Recovery (%)
LHOS no backfill	18.2	5.1	4.5	80
LHOS paste backfill	15.1	4.7	4.7	92

Note: Weighted average mining recovery of Primary (94%), Secondary (85%), and Tertiary stopes (60%)

The mine area is considered to be relatively dry, with the principal source of water being groundwater inflow (variable quantities based on structural interactions and depth) and service water from the development fleet and production activities.

It was determined that the most economical configuration for effective dewatering will be replicate RPZC's current dewatering approach, which uses underground sumps and a staged pumping system. The rising main infrastructure will be extended as the mine progresses deeper.

Average total pumping rates are expected to be approximately 22 L/s in WF3 and 11 L/s in A-mine and B-mine (AAB). Pumping skids of similar capacity to the existing Warman dirty water unit (DWU) series are required to maintain this dewatering rate. The total maximum expected groundwater inflow to the mine is approximately 40 L/s at the end of the mine life. Provisions have also been made for service water handling. Service water will be produced from all drilling machines and for dust suppression following blasting and mucking. The contribution from service water is expected to be less than 5 L/s and is small in comparison to the groundwater inflows.

Power is currently supplied to RPZC mine via two independent feeds. Each feed consists of 2 x 150 mm² cables at 3.3 kilovolts (kV), with a total capacity of 5.9 mega volt amperes (MVA) (limited by breaker settings). Each feed is capable of 4.2 MVA with modified breaker settings. This system is fully redundant as the current draw of the mine is below this level. Both feeds and all associated switchgear are rated for 11 kV but are currently running at 3.3 kV.

The calculated peak electrical load of the underground mine for the Gergarub Project is approximately 6 MVA. Line losses on the existing 3.3 kV feeds to the underground mine are high due to their lengths. It is proposed to change the feeds to 11 kV and each feeder will have a 11/3.3 kV transformer installed near the point of utilization to minimize voltage drop and maintain the use of existing 3.3 kV equipment to the greatest practical extent.

The function of the underground mine ventilation system is to dilute or remove airborne dust, diesel emissions and explosive gases, and to maintain temperatures at levels necessary to ensure safe production throughout the life-of-mine (LOM). The ventilation system has been designed to meet the requirements of Namibian Regulations and industry best practices.

Paste backfill was selected for the Gergarub Project as it improves both the safety conditions and economics. Paste filling the stopes rather than leaving them void will improve ground stability, increase recovery of the Mineral Resource, and reduce dilution. Paste backfill can be tightly controlled, it requires minimal interference with other mining activities, and provides fast filling rates to reduce stope cycle times. Paste fill will be produced from dewatered tailings mixed with cementitious binder and make-up water to the target density. The online paste fill system will involve the construction of a paste fill plant that uses the tailings stream pumped directly from the processing plant. A paste fill plant operating at approximately 85 m³/hr will provide the necessary yearly backfill demand of the Gergarub Project (approximately 0.45 Mm³) with a plant utilization rate of approximately 60%. Paste filling operations will be possible at higher plant utilization rates for the purpose of filling historical voids.

Laboratory-scale material characterization, rheology and strength test work has been completed to enable design of paste mixes in accordance with strength and reticulation requirements. The test work showed Rosh Pinah tailings cumulative size distributions suitable for producing a paste fill and very good strengths being achieved after 28 days curing. A range of paste fill design strengths and cement additions for vertical and undercut exposures for each of the mining areas have been determined.

Paste fill mixes for bulk paste fill that will not be exposed have also been determined. Based on these design mixes and the paste fill schedule, the expected LOM average cement addition rate is determined to be 3.4% w/w.

The initial management team will include a globally experienced contingent, to ensure that operation start-up is safe and efficient, and that ramp-up targets are met. An approved localisation plan will be established to train and equip the local workforce sufficiently, to enable and ensure a seamless transition of responsibilities over time. The assumption is that most of the equipment operators will unskilled (approximately 80%) and will require training from a basic level, although there are experienced miners and heavy equipment operators in Namibia to draw from. Regardless, the start-up strategy for mining operations takes account of this requirement.

The mine will operate 361 days per annum (allowing for lost days for public holidays and weather delays) on a 24-hour basis with three shifts rotating on an 8-hour duration.

The primary mobile diesel fleet includes development and production drills, loaders (scoops) and haul trucks as well as ancillary equipment.

The average annual mobile fleet requirements:

- 3 development drills
- 2 production drills
- 4 trucks

- 5 loaders
- 13 ancillary equipment

Therefore, there will be 27 mobile fleets in total.

4.7.3 BLAST OPERATIONS

Rock fragmentation will be undertaken by drilling and blasting, with the waste typically requiring blasting with lower powder factors. Blasting will be a core component of the mining operation, impacting all downstream mining and comminution (crushing) processes, and also extending into the plant by way of ore recovery and dilution factors.

Blasting can substantially modify and control material flow within the mining operation, including the feed size to the primary crusher. Blast performance must be assessed in terms of the following outcomes:

- Fragmentation, relating to the feed size supplied to the primary crusher, as well as oversize material and the requirement for rehandling of material, and secondary breakage
- Scoop and haul productivity, including wear and maintenance costs
- Use of tracked and other equipment to maintain the access and work areas
- Grade control
- Primary crusher power consumption, throughput, and maintenance costs
- Disruption to material flow during muck, haul and crushing that affects equipment efficiency.

The stopes are expected to be 15 m by 30 m. The material type at the site is suitable for a stoper capable of drilling holes with a diameter of up to 150 mm. Stoper burden, spacing and sub-drill design will be functions of the selected powder factor, which is based on the unconfined compressive strength measurement results from the geotechnical study.

A lower relative energy factor was assigned to the waste rock because the waste material needs to be efficiently and economically excavated, hauled and placed on the waste rock dump. On the other hand, with the ore material's higher relative energy factor, any finer fragmentation could benefit the downstream crushing and milling costs of the Project.

In areas where mining stopes may remain open for extended periods, it is good practice to minimise the fracturing of the back during blasting. In such identified areas, wall control blasting, also known as pre-splitting, can be considered. Pre-splitting was provided within the final pit boundary along the high wall, to create safe working conditions in the lower areas.

4.7.4 DRILLING

Drilling is the first operation performed at most mining operations. Electric hydraulic stoper drills are predominantly used. For this Project, a [make and model] drill rig has been selected for the production holes, for ore and waste benches, and the wall control blasting holes.

4.7.5 LOAD AND HAUL OPERATIONS

The overall scale of mining envisaged for the Project is a medium-sized mine with an ore production of 1 Mtpa. As a result of the extent, orientation and shape of mineralisation, selective mining practices have been incorporated into the ore mining methodology, typical of an underground mining operation. Waste and ore mining operations will utilise medium-sized scoops – 8 t to 20 t selective mining class range, combined with a fleet of 30 t ramp haul trucks, will be selected.

4.7.6 ANCILLARY EQUIPMENT

Ancillary equipment that is required for functions that fall outside of the primary production equipment's scope, is also necessary for mining operations. Primary production costs are directly impacted by a number of aspects related to ancillary equipment. Support equipment is the lifeline of reliable and cost-effective mine production, and is required for the following functions or activities:

- Keeping the loading, tipping and haul drifts and road areas maintained and clean, thus prolonging tyre life and making the operation safe
- Contributing to the mitigation and reduction of outside mobile equipment noise (via good road maintenance)
- Maintaining drifts and haul road conditions, thus prolonging tyre life and making the operation safe
- Suppressing dust emissions from health, safety, environmental, and financial perspectives
- Supporting the full equipment maintenance and diesel requirements for remote, track-propelled equipment, and breakdowns
- Ore, waste, haul and pass drift road preparation and levelling
- Fueling of track-mounted equipment, and large or slow-moving equipment
- Rehabilitation.

The tertiary support equipment fleet consists of units that assist in tasks that are required, in order to make primary and secondary fleets' work easier and safer. Other functions they complete are not production-related and have no direct impact on production. The tertiary equipment fleet consists of:

- Small trucks used for maintenance activities,
- Light delivery vehicles used to transport management, technical services, and maintenance personnel around the mine,
- Buses used to transport operators and employees,
- Lighting plant to increase visibility during night-time,
- Pumping equipment for pit dewatering.

4.7.7 OTHER MINING ACTIVITIES AND INFRASTRUCTURE

Most drifts and haul roads, dumps and stockpiles required for the LoM will have to be constructed during the first year of mining. The waste dump will progress by the haul truck tipping on the top elevation of the dump, with the dozer pushing the waste down. These actions will cause the waste dump to progress horizontally over time.

Waste dumps should be progressively rehabilitated with suitable rehabilitation stable slopes, materials, subsoil, and topsoil where possible. Rehabilitation must be performed as soon as possible on the external faces of the waste dump (progressive rehabilitation), to reduce the risk of dump failure, heavy erosion, loss of fines, visual and air quality impacts. Ore stockpile dumps will be constructed in close vicinity to the primary crusher tipping point, in order to minimise the reclamation costs and meet the environmental management requirements.

Waste rock will be required for the construction of mine infrastructure such as run of mine (RoM) pad and tailings storage dam walls. During normal operations, the ore feed will be achieved by a combination of ore tipped directly into the RoM bin by conveyor or haul trucks from oversize stocks with the RoM loader adding other appropriate ore material from RoM grade control stockpiles.

Mine water management will mainly consist of in-mine and surface run-off control within the mine workings and active mining areas and pumping from the main mine sump and mine area temporary sumps. Dewatering pumps will pump excess water to a suitable holding ponds and tanks ready for use as dust suppression and plant make up water. Water will be 100% recycled.

Drift and haul road dust suppression is considered for the Project and will be handled through a comprehensive dust management system. A suitable product may be applied during drift and haul road construction and maintained on a customised maintenance programme.

4.7.8 MINE AND HAULAGE DESIGN

Mine and haul-conveyor design was developed from the mine optimisation study to produce a practical configuration pit with drifts, ramps and haul road system. The drift and ramp positioning within the overall mine and haul road design is an integral component of mine design because it influences the waste: ore ratio of the overall design, the performance of the equipment, as well as the operating costs. The positions of the ramps and passes were determined based on the ore configuration and taking into consideration the position of the primary crusher and the waste rock dumps.

Sufficient room for manoeuvring is required to promote safety and maintain continuity in the haulage cycle. The width criterion for a drift haul segment is based on the widest vehicle in use, which is the Caterpillar 1700 coop, with a minimum operating width of 4.0 m. To design for anything less than this dimension would create a safety hazard due to a lack of adequate

clearance. In addition, narrow lanes often create an uncomfortable and unsafe driving environment, resulting in slower traffic, and thereby impeding production.

A drift, ramp and haul road gradient of 1:7 was selected for the Project. The selection of the haul ramp/road gradient was based on international best practice for the type of trucks that will be utilised.

The design, construction and maintenance of drifts, ramps and haul roads have a considerable impact on haulage cost, which makes up a greater percentage of the total mining cost. It is therefore important that appropriate, detailed sets of designs for haul road construction are compiled for the site.

The benefits of an improved haul road design are efficiency of haulage by reduction in cycle time, reduced fuel burn, and reduced truck component wear. It is therefore desirable to generate a minimum site-wide construction standard for both new and existing haul roads. The minimum bench operating width for the pit is limited by the size of the equipment.

Ramp positioning within the mine is an integral component of mine design. It influences the production cycle timing (drill – muck – blast) and the performance of the equipment, both of which contribute to operating costs and performance on key performance indicators and overall operating performance, including that of the processing plant and refinery.

The exit positions of the ramps were determined taking into consideration the proposed position of the primary crusher and the waste rock dumps.

4.7.9 METTELURGY AND PROCESSING

As per RPA's Technical Report for the Gergarub ML application (2022), Gergarub will construct and commission a 1.0 Mtpa concentrator at Gergarub to process the mined ore. Specifications for the concentrator will be aligned with the RPZC concentrator. Key aspects of the concentrator include:

- The metallurgical performance projections for the concentrator indicate an approximate average recovery of 91.1% for zinc, 74.1% for lead, and 51.6% for silver.
- The average zinc concentrate will be 51.2% and the lead concentrate grade will be 58.2%.
- The milling circuit will consist of a SAG mill operating at throughput of 132.5 tph. The SAG mill will be a 6.1 m x 2.36 m Effective Grinding Length (EGL) with 1.8 MW motor and open grate discharge operating in closed circuit with primary and secondary cyclones to produce a combined feed slurry at a P80 particle size of 90µm to the flotation circuit.
- The lead flotation circuit is of conventional design inclusive of a rougher, scavenger, and a cleaner flotation circuit with regrind. The circuit will have an effective capacity of 0.75 m³/t/h and a required flotation volume of approximately 99 m³.
- The zinc flotation circuit will have a capacity of 2.6 m³/t/h and a required flotation volume of approximately 343 m³. This will generate an overall residence time of the order of 60 minutes for flotation.

Concentrates - Lead and zinc concentrates will be pumped to individual high-rate thickeners and the underflows filtered in Larox plate diaphragm filters. Filtrate is recovered to process water storage for re-use in the plant. Zinc circuit tailings stream is pumped to a high-rate thickener, water is recovered to the process water storage and thickener underflow pumped to an above ground tailings storage facility.

Figure 10 provides a high-level summary of the Gergarub Project process flowsheet.

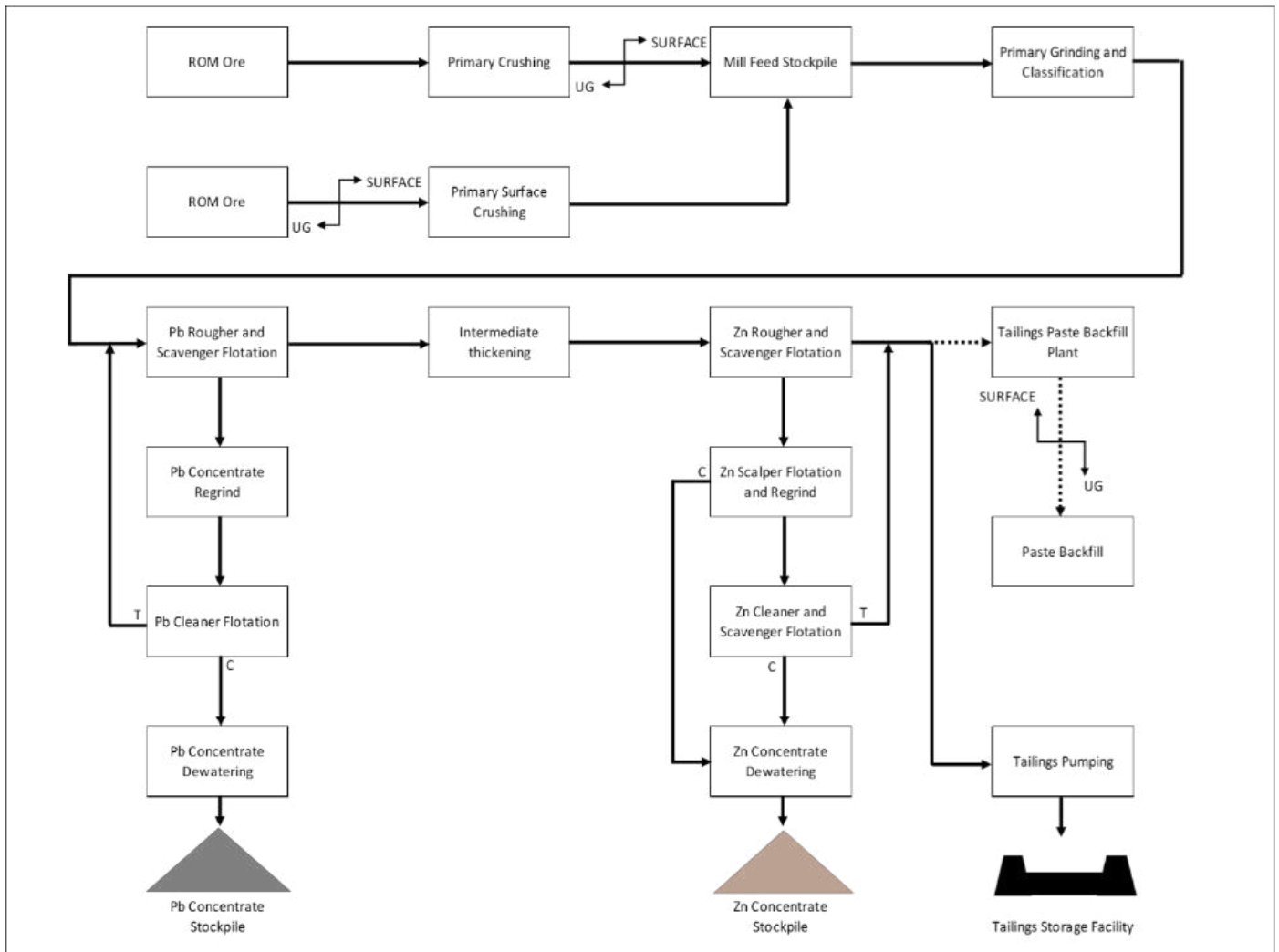


Figure 10 -Simplified flowsheet for the Gergarub Project (Source: DRA 2020)

Locked cycle variability test work on mineralized ore blends has been concluded in a bid to quantify the expected recovery ranges and highlight the degree of variability that can be expected. The locked cycle flotation test work metallurgical projections achieved lead recoveries in the range 68% to 88% at a concentrate grade range of 32% to 60%. Similarly, zinc recoveries in the range 77% to 96% were achieved, with a final zinc concentrate grade ranging between 48% and 56%. Jameson Cell pilot test work has shown that it is possible to produce a zinc cleaner scalper concentrate with a zinc grade of 50%, with zinc recovery ranging from 55% to 60%, in a single stage, when treating a rougher concentrate with a grade of 28% to 30% zinc.

Metallurgical performance projections have been derived using discounted test work results in combination with Rosh Pinah operational performance data. Experience has shown that for RPZC samples, laboratory bench-scale flotation performance is better than that achieved for full scale operations. For this reason, a discount was applied to the laboratory test data. The metallurgical performance projections for the Gergarub Project and upgrade indicate that an average lead recovery of 68.5% at a concentrate grade of 50% can be achieved while for zinc an average

recovery of 89.6% at 51% concentrate grade is expected. Based on the 2019 to 2021 production data, an average lead recovery of 63.7% at a concentrate grade of 48% and an average zinc recovery of 83.6% at 50% concentrate grade is expected for current operations prior to the implementation of the Gergarub Project.

4.8 SURFACE INFRASTRUCTURE AND SERVICES

The following was summarised and derived from the Gergarub Strategy Optimization Study for Gergarub Mining and Exploration (Pty) Ltd, by AMC, 2022, the Technical Report of the Gergarub Deposit, Namibia, by Rosh Pina Mine and Skorpion Zinc Mine, 2022, and with supporting information and explanations from the Rosh Pinah Expansion "RP2.0" NI 43-101 Feasibility Study by AMC 2021

4.8.1 ADMINISTRATIVE BUILDINGS

The mine office complex comprises the administration and engineering buildings, which provide working space for management, supervision, geology, engineering, and other operations support staff. The main administration infrastructure at Rosh Pinah includes the following:

- Administration management building.
- Human resources building.
- Security control building.
- Training offices.
- Safety / health / environment building.
- Supply chain receivables, warehouse, and stores facilities.

4.8.2 GEOLOGICAL CORE SHED

All primary and secondary drill cores are photographed before the core is stored at the core shed. Since full core samples are taken in all tertiary drilling (to be sent to the laboratory), the tertiary drill core (or the waste part remaining after sampling) is discarded on the waste dumps and not stored in the core shed.

4.8.3 MINING CHANGE HOUSE

Change house facilities accommodating lockers, change room, showers, and washrooms for the mine, maintenance and processing plant personnel are located at the mine site.

Personal protective equipment such as gloves, safety glasses, self-rescuers, hard hats, and cap lamps are provided by RPZC.

4.8.4 SURFACE MAINTENANCE WORKSHOPS AND CRITICAL SPARES

The surface maintenance facilities include:

- Drill and blast workshop
- Load and haul workshop
- Underground electrical workshop

- Plant maintenance workshop
- Comminution maintenance workshop
- Surface electrical and instrumentation workshop
- Transport workshop
- Trackless equipment wash-bay facilities
- Tyre maintenance workshop

Due to the remote location of Rosh Pinah, the major components and critical spares kept on site include:

- Rock Hammer
- Jaw Crusher Shaft Assembly (jaw stock)
- Jaw Crusher Wearing components
- All machinery driving electrical motors
- All machinery driving gearboxes
- SAG mill motor
- SAG mill gearbox
- SAG mill pinion gear
- SAG mill girth gear
- Agitators for flotation plant
- Plant and underground supply electrical transformers and motors
- LHD and truck drive components
- Compressors
- Various drill drifter hammers
- Land Cruiser drive components

4.8.5 FUEL FACILITY

Diesel fuel is required for the underground mobile mine equipment and surface vehicles. Diesel is stored in two purpose-designed tanks, one with capacity of 82,000 L, the other with capacity of 23,000 L. There is a surface refuelling station that allows for refuelling of both light vehicles and heavy-duty mining equipment. A fuel and lube management office are located near to the fuel dispensing facility.

A self-bunded diesel fuel farm has been allowed for Gergarub. The self-bunded units negate the need for bunded areas and only require a level hardstand on which to rest. The tank units will be equipped with their own diesel transfer and dispensing pumps located inside a lockable cabinet on the tanks. The tank capacities will be based on supplying at least three days diesel requirement to Gergarub considering that the Skorpion main diesel facility is located nearby.

4.8.6 EXPLOSIVES MAGAXINE AND BULK EMULSION STORAGE FACILITY

Emulsion or ammonium nitrate fuel-based explosives will be required for development and production blasting. Explosives would be transported to site using supplier transport equipment

and personnel. Upon delivery to Gergarub, all explosive products will be transferred to surface storage facilities, which will include separate explosives and detonator magazines.

An appointed magazine master and deputy magazine master would be responsible for the surface magazines including ordering explosives, supplying the underground operations, maintaining the surface magazine in accordance with regulatory requirements, and transport of explosives on-site using specialized vehicles. The management of the explosives and blasting activities underground will be under the care and control of approved and qualified mine personnel.

The explosives magazines will be sized according to the maximum production requirements, and an additional underground explosives magazine may be utilized if necessitated by operational requirements.

The surface explosives magazines have capacity for 1,500 bags of ANFO (25 kg per bag) and 50 t of bulk emulsion.

The management of the underground explosives store and blasting activities will be under the care and control of approved and qualified mine personnel.

4.9 PROJECT INFRASTRUCTURE – GENERAL SUPPORT

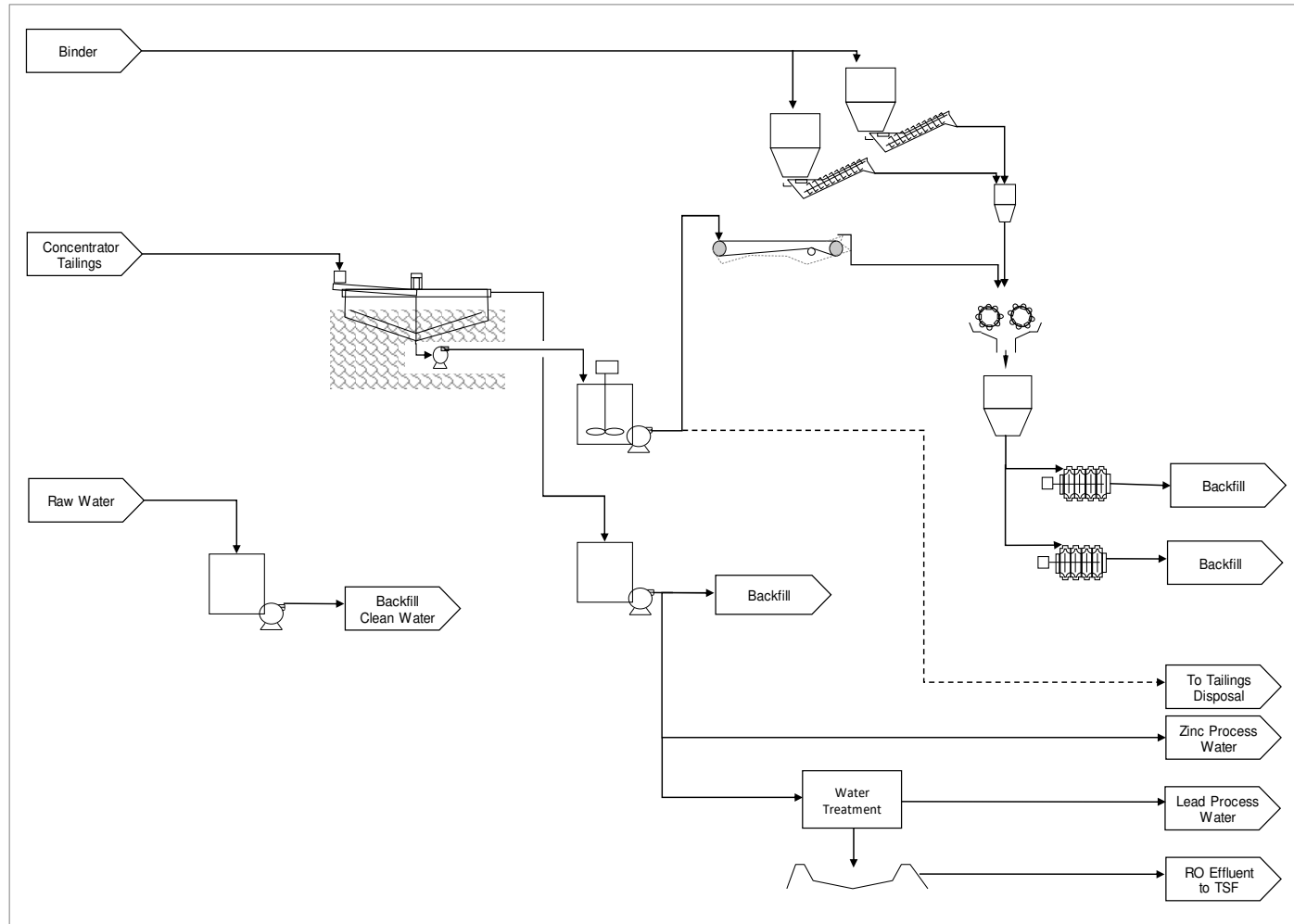
As per the RPA Gergarub Technical Report, 2022, Rosh Pinah is accessible via sealed roads from Windhoek 800 km to the north and from the South African border in the south. The closest commercial airport is located at Oranjemund approximately 105 km south-west of Rosh Pinah, and the nearest railhead is located at Aus on the Lüderitz - Keetmanshoop line, both are accessible by sealed road.

The operating assumption for Gergarub is that most personnel would reside in Rosh Pinah. This would be supplemented with short-term accommodation in the form of guesthouses and hostel-style lodging. The assumption is that additional accommodation facilities would not be constructed as part of the project, with sufficient accommodation capacity available in Rosh Pinah

Gergarub will require a backfill plant (Figure 11) for the Gergarub preferred mining method in order to maximize ore recovery. Without backfill, strategic rib, crown and dip pillars would be required, commensurate with geotechnical requirements. Pillars would reduce the overall mineable resource, so the use of an engineered backfill will increase overall recovery of the resource. An efficient backfill cycle is required to ensure that backfill does not become a production bottleneck, and the backfill plant would be designed with sufficient surge capacity to enable the mine production plan.

As part of an updated backfill plant design the following specifications would require further assessment and development:

- Selection of an appropriate backfill, suited to the requirements of LHOS + DAF mining.
- Backfill design and testwork, including tailings suitability and backfill strength.
- Backfill plant and reticulation system design and engineering.



Source: DRA 2021.

Figure 11 - Paste fill plant process flow diagram

When paste fill is required underground, thickened tailings will be directed to the paste plant. The paste plant operator will select the paste fill recipe specified for the stope void, including density, cementitious binder dosing rate and delivery rate. Bulk cement will be stored in a steel silo from where it is delivered to the mixer.

4.10 UTILITIES

4.10.1 POWER SUPPLY

Power to Gergarub would be sourced from the National Power Utility Company of Namibia (NamPower). As further studies for Gergarub's power requirements are developed for the mining strategy, Gergarub will apply to secure power from NamPower. Electrical infrastructure requirements based on the power requirements of the mining strategy will be reviewed and assessed in future studies, this will also include any requirements for off-site NamPower infrastructure upgrades required to supply power to site. Aligned with Trevali's sustainability target of 25% renewable energy, the project proponent continues to pursue such options.

4.10.2 WATER SUPPLY

Water would primarily be sourced from the national supplier. Once further studies for the mining strategy have been completed and the water requirements for Gergarub are determined, Gergarub will apply to the Namibia Water Corporation (NamWater) for the supply of water to site. Water infrastructure designed for peak consumption and water flow requirements will also be reviewed and assessed as part of future studies. The studies would include an integrated assessment of all pumping, water treatment and dewatering infrastructure networks.

Water for Rosh Pinah is sourced from the Orange River by the Namibia Water Corporation (NamWater) via approximately 20 km of pipeline. Raw water consumption rates were estimated using the overall site water balance developed for the feasibility with the inclusion of thickened tailings, paste backfill and water treatment. The modelling shows a reduction in water consumption with the inclusion of paste fill. The total raw water consumption of 1.54 m³ per tonne milled for current operations (dilute tailings) will reduce to 0.78 m³ per tonne milled with the inclusion of a tailings thickener, paste backfill and water treatment at the current throughput rate. A further reduction to 0.65 m³ per tonne milled is expected for the Gergarub Project at a higher throughput rate of 1.3 Mtpa. The water consumption figures outlined above reflect the water requirement for the both the mine and processing plant.

Based on the design mill throughput, the estimated total raw water supply requirement from the Orange River is 90 m³/hr when the paste fill plant is in operation, increasing to 134 m³/hr when the paste fill plant is not operational. The annual average raw water requirement is 107 m³/hr based on the requirement for approximately 63% of the tailings material to be placed underground as paste fill. At the estimated future consumption rate (with inclusion of tailings thickener water treatment at the paste plant), the existing raw water supply system from the

Orange River, which has a capacity of approximately 135 m³/hr, will meet the Gergarub Project needs.

4.11 MINERAL AND NON-MINERAL WASTE

The Project is expected to produce waste rock, tailings waste, domestic waste, and hazardous waste as part of its operations. Domestic and hazardous waste management is guided by the procedure "SPI 021 Waste Management on Rosh Pinah Base Metals", which forms part of the certified ISO 14001:2015 EMS. ASEC (ASEC 2019) identify risks associated with the waste disposal, hydrocarbon waste and bioremediation facility. These risks are being effectively managed through an action plan being implemented at Rosh Pinah, experience which informs the Gergarub Mine planning.

Waste rock produced during underground mining is, where possible, disposed of in underground stope voids, or deposited on the surface waste rock stockpile.

4.12 WASTE ROCK

Mine waste rock would be hauled via decline to a surface waste dump, or where possible, placed underground in mined-out stope voids. The mine waste rock mined during the project construction phase would also be used to construct the surface run of mine (ROM) pad.

4.13 TAILINGS

The mining strategy for Gergarub will require a tailings storage facility (TSF). The historic TSF feasibility design excluded the use of process tailings for mine backfill purposes, however the mining strategy requires backfill for the preferred Gergarub mining method. The requirement for mine backfill will likely reduce the total tailings storage capacity required over the project LOM compared with the SRK FS design.

As part of an updated TSF design the following criteria (non-exhaustive) will be considered: • Legal framework and regulatory compliance.

- Site selection.
- Environmental considerations:
 - Biodiversity.
 - Heritage / archeological resources.
 - Ground water impacts.
 - Proximity to surface water resources.
 - Visual impact.
 - Proximity to local communities.
 - Public safety (failure zone assessment)
 - Energy usage and carbon footprint.
- Economic and engineering criteria:

- Seepage potential.
- Residue transfer.
- Failure impact assessment
- Undermining.
- Capital costs.
- Operating costs.
- Rehabilitation costs.
- Public acceptance.

The operation of the TSF would remain largely consistent with the SRK FS, with process residue (tailings) transferred from the process plant to the TSF, return water from the process plant and storm water (where appropriate) would be reintegrated with the site water storage facilities. Tailings utilized for backfill would predominantly be sourced directly from the process plant, reducing the total material transferred to and from the TSF.

Tailings slurry from the processing plant is pumped via a pipeline to the TSF and distributed for deposition by means of a ring feed system.

4.14 GENERAL WASTE

Waste will be separated at source, stored in a manner that there can be no discharge of contamination to the environment, and either recycled or reused where possible. On-site facilities will be provided at a dedicated waste storage facility for sorting and temporary storage prior to removal and disposal to appropriate recycling or disposal facilities off-site.

Industrial waste will be sorted on-site and disposed of at appropriate facilities. Hazardous waste includes, but is not limited to, the following: fuels, chemicals, lubricating oils, hydraulic and brake fluid, paints, solvents, acids, detergents, resins, brine, solids from sewage, and sludge. The waste types as set out in Table 8 below will be generated by the project, a dedicated waste management and recycling facility will need to be built on site that specifically manages these waste types and this will include an incinerator.

Table 8 - Waste specification, storage and use

Waste type	Waste specifics (example of waste types)	Storage facility	End use
Non-hazardous solid waste (non-mineralised)	Wooden crates, pallets, cable drums, scrap metal, general domestic waste	Dust bins in relevant work areas will be provided for different waste types. A waste management contractor will remove dust bins regularly to	Waste will be sorted further at a dedicated waste handling and storage area on site. Recyclable waste will be sent to a reputable recycling company. Some items may be

Waste type	Waste specifics (example of waste types)	Storage facility	End use
	such as food and packaging.	a dedicated waste handling and storage area.	distributed directly to the community if possible. The remainder of the waste will be transported by the waste management contractor to a permitted landfill facility which may be constructed on site for example within the WRD.
	Building rubble and waste concrete	Designated rubble collection points will be determined to which contractors will take rubble and concrete.	The waste management contractor will regularly remove the waste from the designated collection points to the footprint of the waste rock dump.
Hazardous contaminated solid waste (non-mineralised).	Treated timber crates, printer cartridges, batteries, fluorescent bulbs, paint, solvents, tar, empty hazardous material containers etc.	Hazardous waste will be separated at source and stored in designated containers in bunded work areas. The waste management contractor will remove these drums regularly to a dedicated waste handling and storage area.	Hazardous waste will be disposed of at the permitted hazardous disposal site (for example in Walvis Bay) by the waste management contractor.
	Hydrocarbons (oils, grease)	Used oil and grease will be stored in drums in bunded areas at key points in work areas. The waste management contractor will remove these drums regularly to a dedicated waste handling and storage area. The yard will have a dedicated used oil storage area which will include a concrete slab, proper bunding and an oil sump. The appointed bulk	Used oil will be sent to a reputable recycling company for recycling.

Waste type	Waste specifics (example of waste types)	Storage facility	End use
		fuel supplier will collect used oil for recycling.	
	Sewage	Sewage treatment will be required	May be reused as greywater for dust suppression
Laboratory waste	Mineral samples, mineral assay samples, chemical fluids, glass, gloves and general laboratory waste samples	Mineral waste samples that are not required to be kept will be disposed of at the tailing storage facility and at an approved mineral disposal landfill. A mineral waste management contractor will remove the waste on a regular basis to a waste handling and storage area.	Hazardous laboratory waste will be collected regularly and transported to a hazardous disposal treatment facility (for example in Walvis Bay). Non- hazardous waste will be disposed of at an appropriate landfill which may be on site.
Medical waste	Syringes, material with blood stains, bandages, etc.	Medical waste will be stored in sealed containers. A waste management contractor will remove these drums regularly to a dedicated waste handling and storage area.	Medical waste will be transported by the waste management contractor to a permitted medical waste treatment facility.

4.15 EFFLUENT AND WASTEWATER

Adequate facilities to treat the life of mine sewage generated will be installed as part of the project. Surface water and any available runoff will be 100% recycled and used for the site processes.

4.16 SITE COMMUNICATION

Site communications will be used to connect the underground operations with the surface. A control room on the surface would be used to monitor critical infrastructure including ventilation and mine dewatering. Two-way radio communication would be made available throughout the surface and underground operations.

4.17 ACCOMMODATION

The operating assumption for Gergarub is that most personnel would reside in the town of Rosh Pinah. This would be supplemented with short-term accommodation in the form of guesthouses and hostel-style lodging. The assumption is that additional accommodation facilities would not be constructed as part of the project, with sufficient accommodation capacity available in Rosh Pinah.

4.18 DIGITAL TRANSFORMATION

The Gergarub Project could be part of the flagship for Trevali’s digital transformation, as illustrated in Figure 12. Key strategic developments:

- Digitization of assets, and automation of physical processes,
- Data-driven planning, control, and decision making,
- Functional platforms and automated support processes.

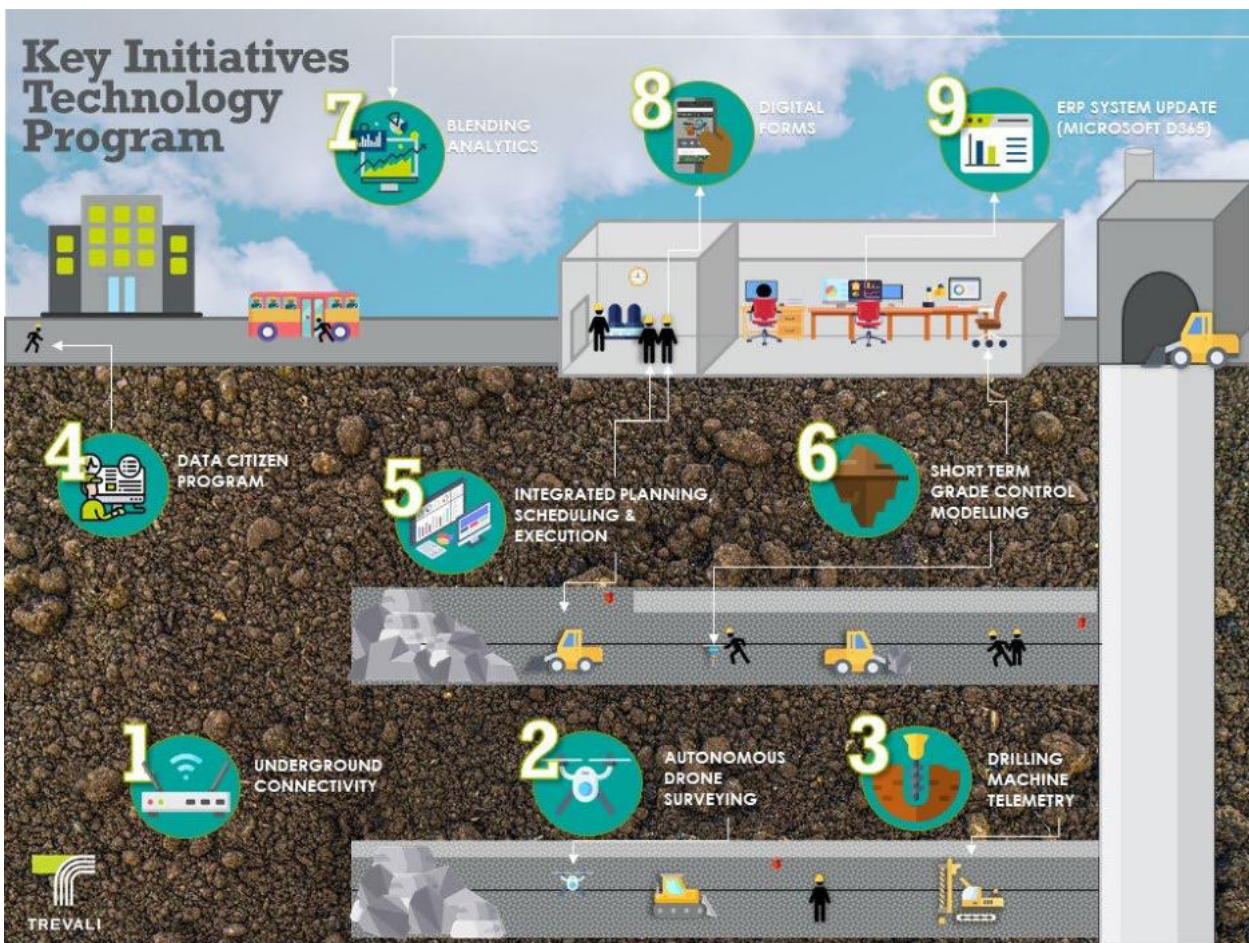


Figure 12 - Gergarub's key initiatives technology program

4.19 ALTERNATIVES CONSIDERED

The following assumptions have been carried forward in the preparation of the cost estimates:

- The project would proceed on an EPCM basis.
- The project would generally be implemented as per the execution schedule.

All material and equipment will be new and purchased from recognized top-tier vendors.

Mining alternatives were assessed, such as only open pit versus only underground. The underground option is most financially viable based on orebody geometry and grade distribution.

In addition, alternate routings of the national road and 66 kV power line were assessed and proposed. Alternatives to conventional tank cells or new rougher floatation technologies where assessment are being evaluated further. Tailings storage location alternatives have been and will continue to be evaluated, due to the limited space available within the lease/licence. Options include expanding the lease/licence, co-dispose tailings with overburden and waste rock, and transport tailings to Skorpion.

The only other alternatives considered were the open pit mining versus underground mining options, and if blended, timing and approach of the transition, as well as the use of paste backfill versus no backfill for the underground open stope mining.

Other alternatives considered are for sequencing and production rates and mining blocks, and alternative power sources such as renewable power such as solar to supplement existing and proposed grid power.

4.20 MINING

The underground mine is planned to be located solely in the primary rock as mining through the surficial material may be very difficult due to stability issues. This means the decline portal and ventilation raise collars will need to be located where the primary rock outcrops on the surface.

Long hole open stoping (LHOS) with backfill to mine the orebody, supplemented with drift and fill (DAF) mining for the orebody extremities (LHOS and DAF) was identified as the most suitable method of mining for this orebody. Long hole open stoping is a form of sub-level open stoping which involves excavating ore in a series of horizontal or sub horizontal levels known as "stopes". A series of vertical or inclined holes are drilled from the top of the stope to the bottom.

Whilst with drift and fill the drift is developed in the ore and is backfilled using consolidated fill. The following drift is driven adjacent to the previous drift. This carries on until the ore zone is mined out to its full width.

When mining is completed in these areas, voids that do not encumber the mining operation and / or the ventilation network can be used to place paste fill (with lower cement content) to reduce the tailings deposition to the TSF.

Long hole open stope (LHOS) with paste fill is recommended to improve local and regional stability, improve operational recovery, reduce dilution, mitigate void risks, and minimize the tailings being pumped to the TSF (to eliminate or delay TFS expansions).

Mining areas are globally advanced top-down, but within each mining area, stopes are extracted using a bottom-up sequence at 30 m level intervals. A mining area typically spans four levels, ranging from three to five. The mining areas are further sub-divided along strike guided by the

lens geometry, mineralization grades, and planned mining sequence to achieve production targets.

4.21 SOCIAL AND COMMUNITY ENGAGEMENT

The town of Rosh Pinah is a mining community, built and managed for the employees working at Rosh Pinah Mine and later from the Skorpion Zinc mine. A joint-venture (50:50) company called RoshSkor was established to manage and operate all town services and infrastructure as a private municipality on behalf of RPZC and Skorpion Zinc.

RoshSkor is responsible for implementing community development projects, though funding is currently jointly funded between RPZC and Skorpion Zinc. There are no funding obligations that would impact the progression of the Gergarub Project. There are no community agreements that require development funds to be provided. All donations are investments and are voluntary and at arms-length from RPZC.

RPZC and Skorpion Zinc assists with the funding for projects that aim to deliver economic independence for the community. Programs include training in basic needlework; hand weaving of carpets; development initiatives in Tutungeni (a township outside of the central Rosh Pinah town), which involves the upgrade of a school, training of community members for the removal of waste and waste segregation; sanitation system maintenance; and other initiatives.

4.22 REHABILITATION AND CLOSURE

The Minerals Act states that the holder of a mineral license must take all steps to the satisfaction of the Minister to remedy any damage caused by any mining activities. In the case of larger mining operations, the Minister demands guarantees that could be used by the Ministry to remedy damage caused by mining activities. This is in the form of closure financial liability. However, there is currently no mandatory mechanism for the funding of a Final Mine Closure Plan.

In the absence of Namibian legislation, the Proponent will have to develop a Mine Closure Plan based on the South African Legislative Framework for Financial Provisioning, as provided in the Mineral and Petroleum Resources Development Act, 2002 (Department of Mineral Resources). This plan will be updated on a quarterly basis to ensure that it is continuously aligned with current site conditions.

The Proponent will commit to establishing a rehabilitation plan aligned with the upcoming Namibia Mine Closure Framework (MCF) as part of the mine closure plan. An environmental consultant, in conjunction with the Proponent and the specialist consultants working on the mine design, and those undertaking the environmental impact assessment, will prepare a conceptual mine closure plan as part of the EMP requirements and using all existing information and related closure concepts, planning and costing.

5 ENVIRONMENTAL AND SOCIAL BASELINE

5.1 BASELINE DATA COLLECTION

Initial desktop baseline studies relevant to the project formed part of the initial environmental assessments. As part of this assessment, the baseline environmental and social conditions have been studied in detail, with inputs from specialist studies commissioned as part of the previous environmental impact assessment.

5.2 DESKTOP AND FIELD SURVEYS

Initial desktop baseline studies were completed for the project by various consultants and groups in 2015 for the previous impact assessment conducted by Risk Based Solutions. Additional desktop and field-based baseline studies will be completed in 2023 and will build on the project dataset.

This section sets out the biophysical and socioeconomic baseline conditions in which the project is situated. It is an important part of the scoping phase of the assessment, as it identifies knowledge gaps and their extent that require additional information prior to the assessment phase being completed.

5.3 SPECIALIST STUDIES

The following specialist studies should be considered as set out in Table 9, in order to determine the current state of the baseline environments to support the full ESIA for the mining project:

Table 9 - Specialist studies to be commissioned for the ESIA

Study Area	Purpose
Hydrology	<ul style="list-style-type: none"> – Water supply – Storm protection – Impact downstream users – Clean and dirty water management systems
Groundwater	<ul style="list-style-type: none"> – Assess the potential for contamination of aquifers – Provide a model to determine impacts of drawdown and plume mobility – Assess the sustainability of boreholes for water supply if required
Air quality	<ul style="list-style-type: none"> – Provide emission standards and dust suppression requirements – Assess prevailing wind directions and possible effects of emissions on the process and/or personnel

Study Area	Purpose
	– Model potential air quality impacts
Noise and sense of place	– Identification of possible receptors, and assess levels of noise to which they may be exposed during construction and operations
Traffic	<ul style="list-style-type: none"> – The traffic impact assessment will study the potential traffic impacts and loading on routes associated with the mining activities – Assessing the capacity of infrastructure and safety aspects of the mine entrance – Assessing the need for an intersection upgrade at the mine entrance, and providing a concept layout plan if necessary
Visual and tourism	– Assessing the potential visual impacts of a proposed project on the receiving environment
Blast vibration impact	– Assessing the impact of blasting on receptors in the area

5.4 LAND USE

The deposit is located on the farm Spitzkop 111, along the C13 national road between Rosh Pinah and Aus within the Oranjemund Constituency. It lies approximately 10 km south-east of SZM and 15 km north-west of RPZC.

To the west of the deposit lies Diamond Area 1, a diamond mining area controlled by Namdeb. This area lies within the Tsau //Khaeb national park. The east is predominantly a small stock farming area. Farms are large due to the low carrying capacity of the land.

The region is predominantly a small stock farming area. Irrigation farming along the Orange River has increased significantly in the last two decades. The region also hosts the Lüderitz harbour, an important port for the export of refined and unrefined minerals.

The closest town to the deposit is an unproclaimed mining town, Rosh Pinah, the economy of which mainly revolves around the two nearby existing mines, SZM and RPZC. Mining activity plays a major part in the economy of the Region, with diamond mining (Namdeb operations) and zinc mining being the two major contributors. The mining town, Rosh Pinah, was established in 1970 and has since provided accommodation for those employed at RPZC and later also the employees of SZM.

Surrounding land uses

A number of different land uses surrounds the proposed project area shown in Figure 13. This includes the following:

- *Farming:* Gergarub is located on Farm Spitzkop 111, a privately owned farm which is neighboured by a number of commercial farms farming with livestock and game.
- *Conservation and Tourism:* Rosh Pinah is situated between two conservation areas namely the Tsau //Khaeb National Park and the Fish River National Park. Even though Rosh Pinah is not a tourist destination itself, it is frequented by tourists passing through en-route to another destination such as the Fish River Canyon. The contrasting geological features of the area provide visually stimulating scenes to passing tourists (Fish Eagle Productions, 2012).
- *Mining:* SZM and its associated infrastructure is located to the northwest of the proposed project area. A number of drilling and exploration activities can be found in the area.

Road users: The C13 National Road traverses the proposed site. This road is used by visitors, tourists and Rosh Pinah residents. The employees of SZM make use of this road daily. The diversion design of the C13 around the mining area should consider the best options for optimal road safety.

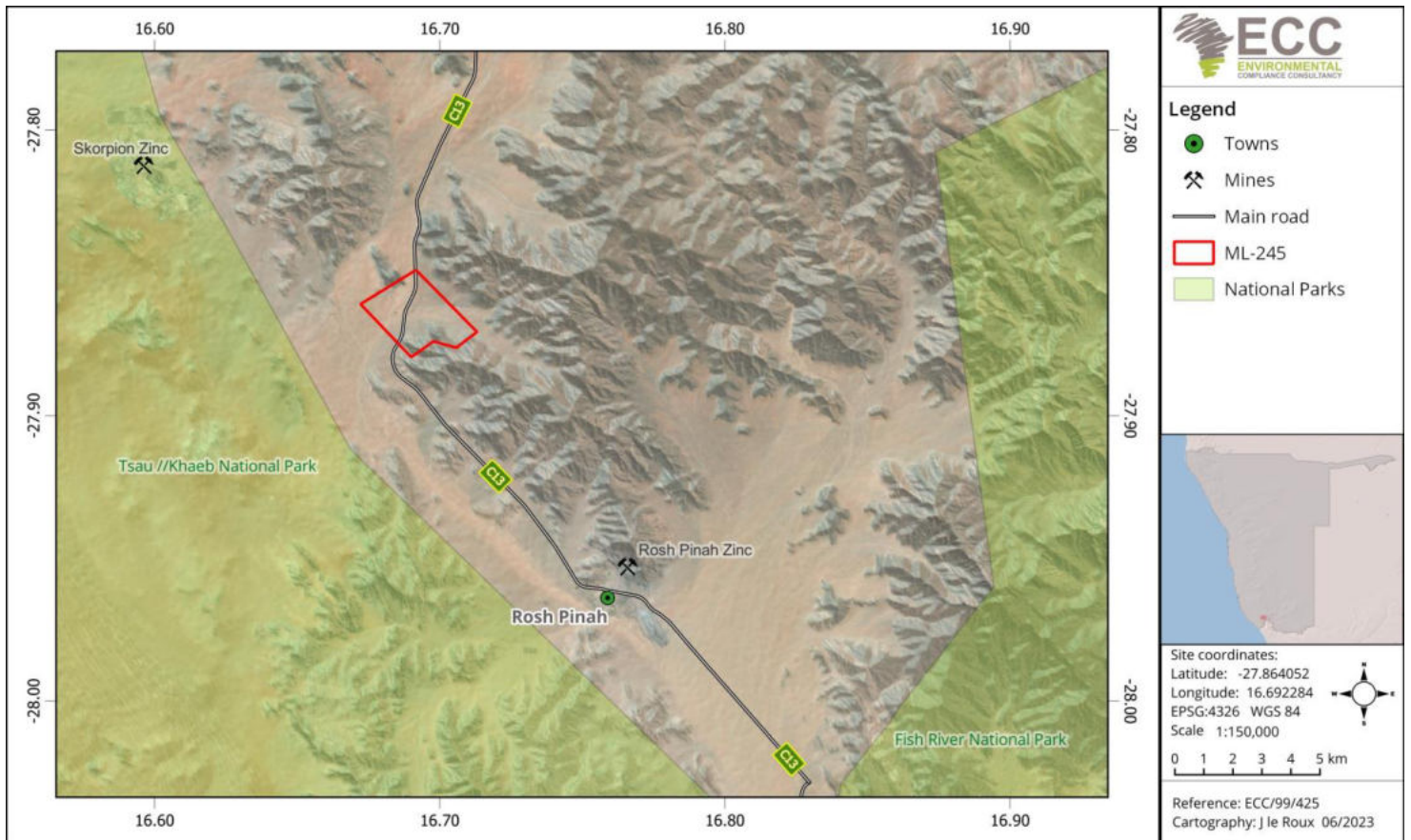


Figure 13 - Land uses that surround the Gergarub Project

5.5 INFRASTRUCTURE AND BULK SERVICES

The Gergarub deposit lies in the Karas Region which borders the Atlantic Ocean to the west and the Northern Cape Province of South Africa to the south. The Orange River is the main water source of the area and forms the border between Namibia and South Africa.

Nampower has been approached regarding power supply to Gergarub. It has been decided that the existing Obib Transmission Station should be used. In addition, new 66 kV lines from Obib to a new site located within the mining complex will be constructed. The total distance of the new lines is approximately 9 km. This route will run parallel to an existing servitude. From the new distribution station an 11 kV distribution line is fed to a mini substation and the 66 kV to the Portal Substation. Energy consumption is expected to increase by ±300 MWh/day and the monthly Maximum Demand (MD) could increase up to 20 MW.

At present the town of Rosh Pinah, SZM as well as Namzinc Refinery is supplied with water from the Orange River by NamWater. New water supply infrastructure would be required for the extension of the existing water line to the new supply points for Gergarub.

The ore deposit extends underneath the C13 national road and mining will take place under the C13 national road as shown in Figure 14.

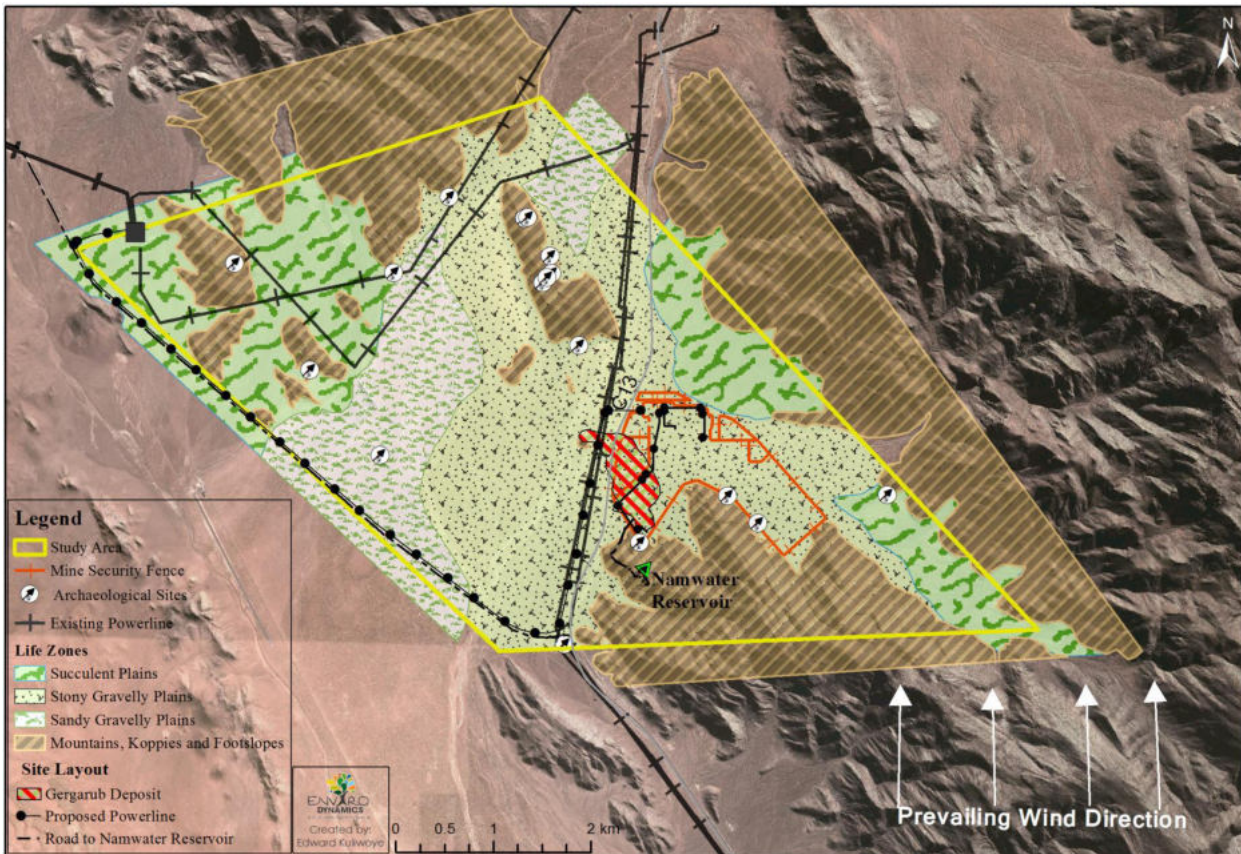


Figure 14 - Location of the Gergarub deposit in relation to the ML and current infrastructure.

5.6 BASELINE BIOPHYSICAL ENVIRONMENT

The Gergarub deposit lies in the Karas Region which borders the Atlantic Ocean to the west and the Northern Cape Province of South Africa to the south. The Orange River is the main water source of the area and forms the border between Namibia and South Africa.

The region is predominantly a small stock farming area. Irrigation farming along the Orange River has increased significantly in the last two decades. The region also hosts the Lüderitz harbour, an important port for the export of refined and unrefined minerals.

The region is hyper arid with low average rainfall and high temperatures. It receives the majority of its moisture from the coast in the form of fog originating across the Benguela Current. The Succulent Karoo Biome is maintained by this air movement from the coast, and it is known as a biodiversity hotspot. The area is near the Tsau-Khaeb and the Fish River National Parks. It is also located along the tourist route to these parks as shown in Figure 1.

5.7 CLIMATE

The climate in the study area is extremely arid with hot and dry conditions and the ecosystem is driven by air movement. Due to the close proximity of the Atlantic Ocean and its cold Benguela current, fog is recorded between 50 to 75 days per year.

5.7.1 TEMPERATURE

Daytime temperatures are hot, reaching more than 40°C in summer. Nights are cool, becoming cold in winter when temperatures often fall below 0°C, shown in Figure 15.

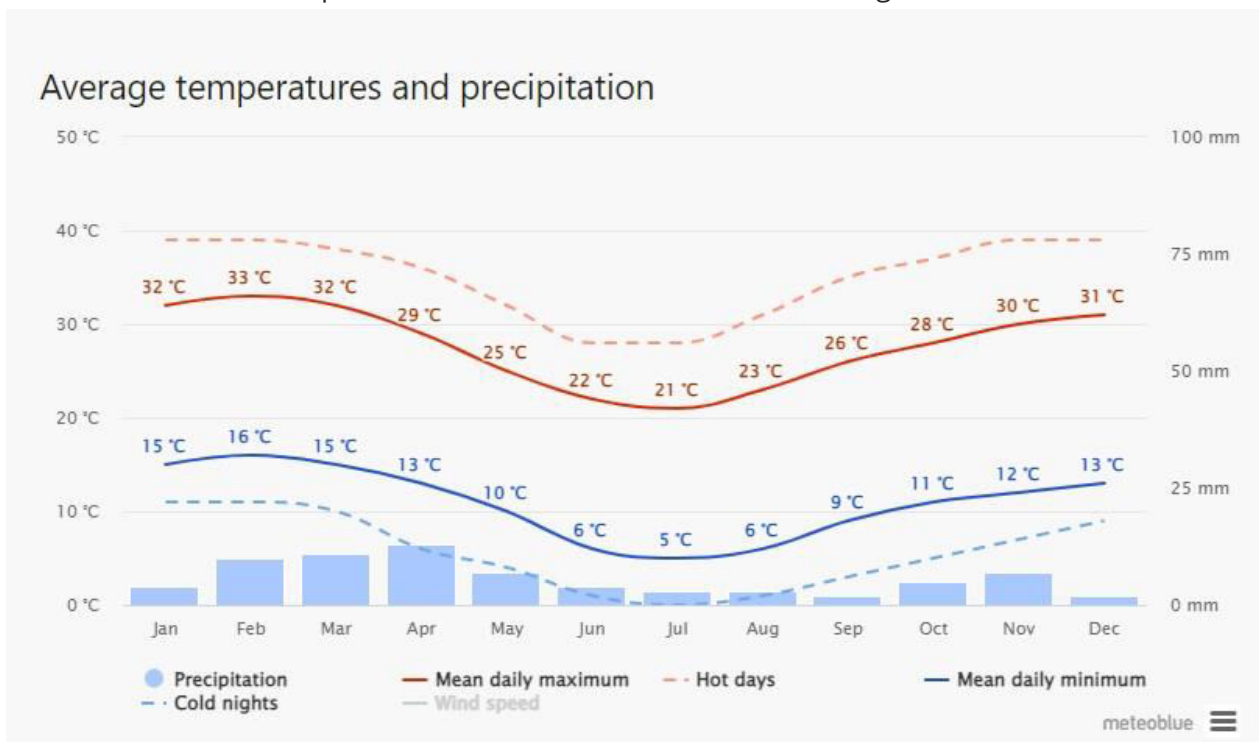


Figure 15 - Average yearly temperatures at ML 245

The winds in the area are illustrated by the wind rose at SZM for the period January 2003 to April 2008 (Figure 16). A wind rose simultaneously depicts the frequency of occurrence of wind from the 16 cardinal wind directions and in different wind speed classes. Wind direction is given as the direction from which the wind blows, i.e., south-westerly winds blow from the southwest. Wind speed is given in m/s, and each arc in the wind rose represents a percentage frequency of occurrence (39 percent in this case).

In the Rosh Pinah area, the winds are predominantly from the sector south-southeast to south-southwest, with more than 45% of all winds from this direction. Winds from the sector north-northwest to north do occur, but infrequently. Generally, the winds are light with a high frequency of winds less than 6 m/s. However, strong winds do occur, reaching 15 m/s or more. The highest frequency of strong winds is from the south-southeast and south.

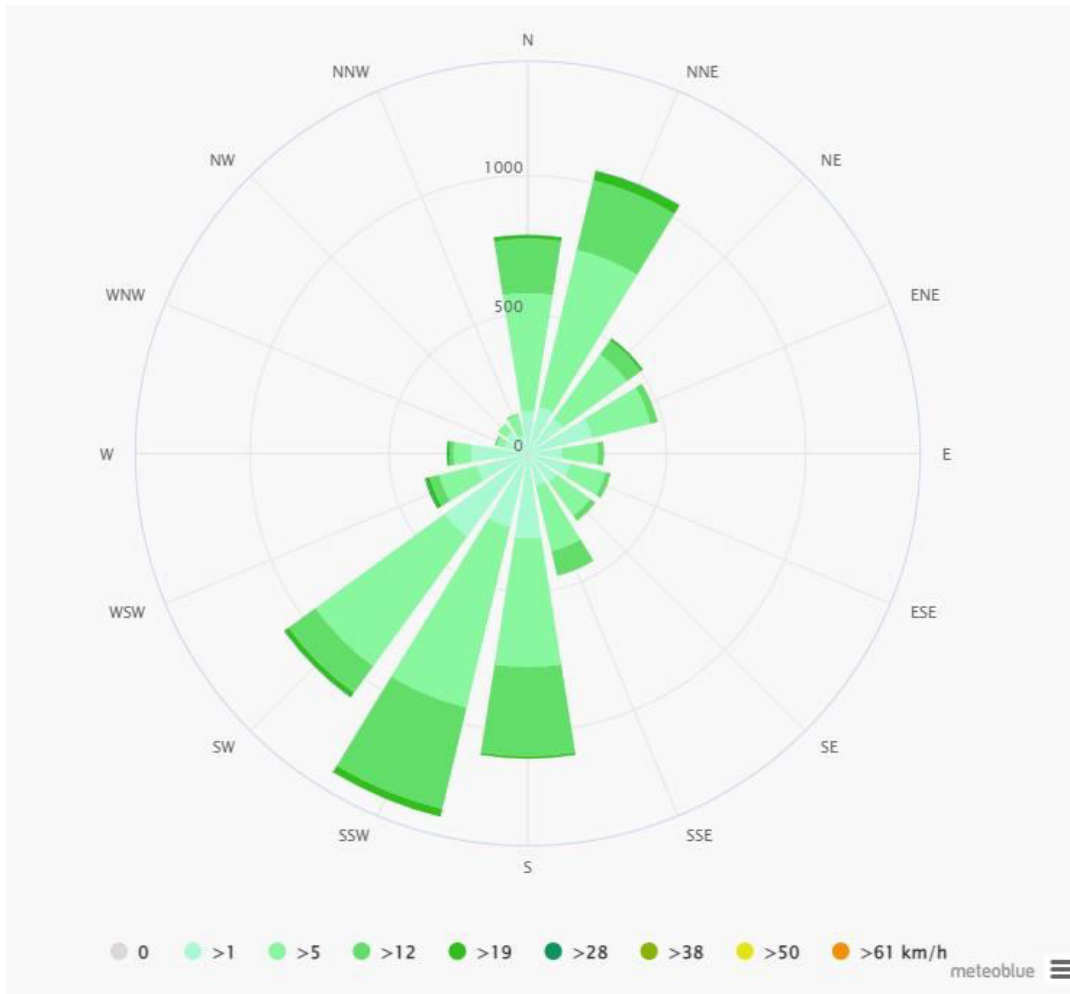


Figure 16 - Prevailing wind direction and wind speed in the ML 245 area

Processing activities can generate or release pollutants such as sulphur dioxide (SO₂) while the mining activities cause particulate emissions. Measurements of monthly average dust fall at the landing strip at SZM are significantly below the South African industrial limit value of 1 200 mg/m₂/day. It is unlikely that dust emissions from SZM will affect air quality at Gergarub considering the prevailing southerly winds and if so, the effect will be negligible.

The main sources of emissions at Rosh Pinah town result from the RPZC and the windblown dust from its tailings dam south of the town. Emissions from mining and the tailings dam contribute to particulate concentrations but the contribution from vehicles is negligibly small. The relative distance of Gergarub from Rosh Pinah and its protected location from the southerly wind behind topographical features will ensure that the Gergarub mine site’s air quality is not affected by the sources at Rosh Pinah.

Table 10 below shows the list of the sensitive receptors whose air quality is mostly likely to be affected by the activities at Gergarub and their distance from the Project site.

Table 10 - Sensitive receptors and their distance from the Project site

Location	Distance from Project site (km)	Wind Direction
Mr Nick Kotze: Spitskop Wildsplaas	5	N
Caterer’s accommodation at SZM	9.5	WNW
SZM Exploration camp	10	WNW
SZM security gate	2.7	SW
Tutungeni residential area	11.1	SSW
Rosh Pinah town	11.8	SSW

5.7.2 RAINFALL AND EVAPORATION

Rain is infrequent with an average of less than 100 mm of rain received annually occurring mainly during the summer between October and February. From January 2003 to April 2008 rain occurred on only 235 days as shown in Figure 17. Most rain events result in rainfall of less than 3 mm however occasional downpours can occur.

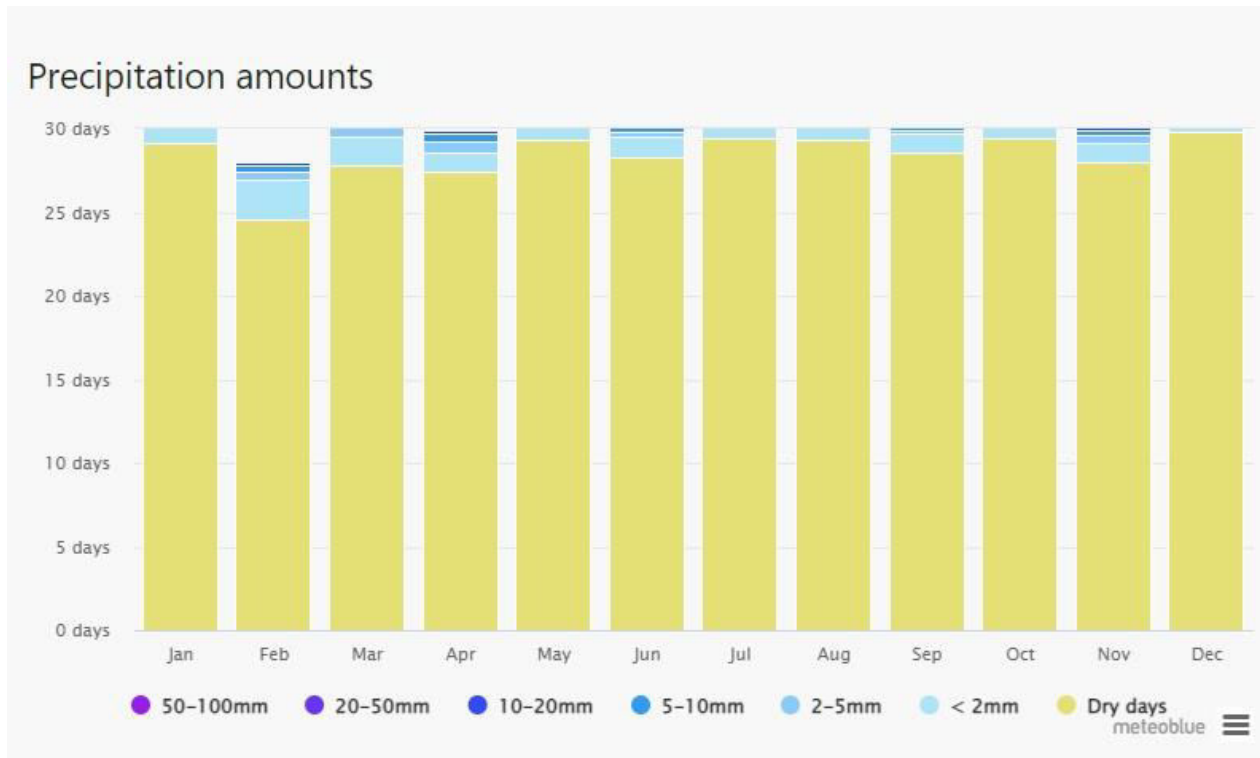


Figure 17 - Average rainfall received annually and ML 245

5.8 LOCAL GEOLOGY AND GEOMORPHOLOGY

The Gergarub deposit is hosted within the Gariiep Belt, which extends from northwestern South Africa into southern Namibia. The following geology and mineralization description is based on

the Technical Report of the Gergarub Deposit, 2022, Rosh Pinah Zinc and Skorpion Zinc Mine. The Gariep Belt is situated between the Kalahari- and Rio del Plata Cratons, part of the spreading of the Adamastor Ocean. It consists of metamorphosed fill of the Gariep basin, one of a number of Neoproterozoic basins that evolved around the margins of the Kalahari Craton as a consequence of the break-up of a 1.0 Ga supercontinent as illustrated in Figure 18.

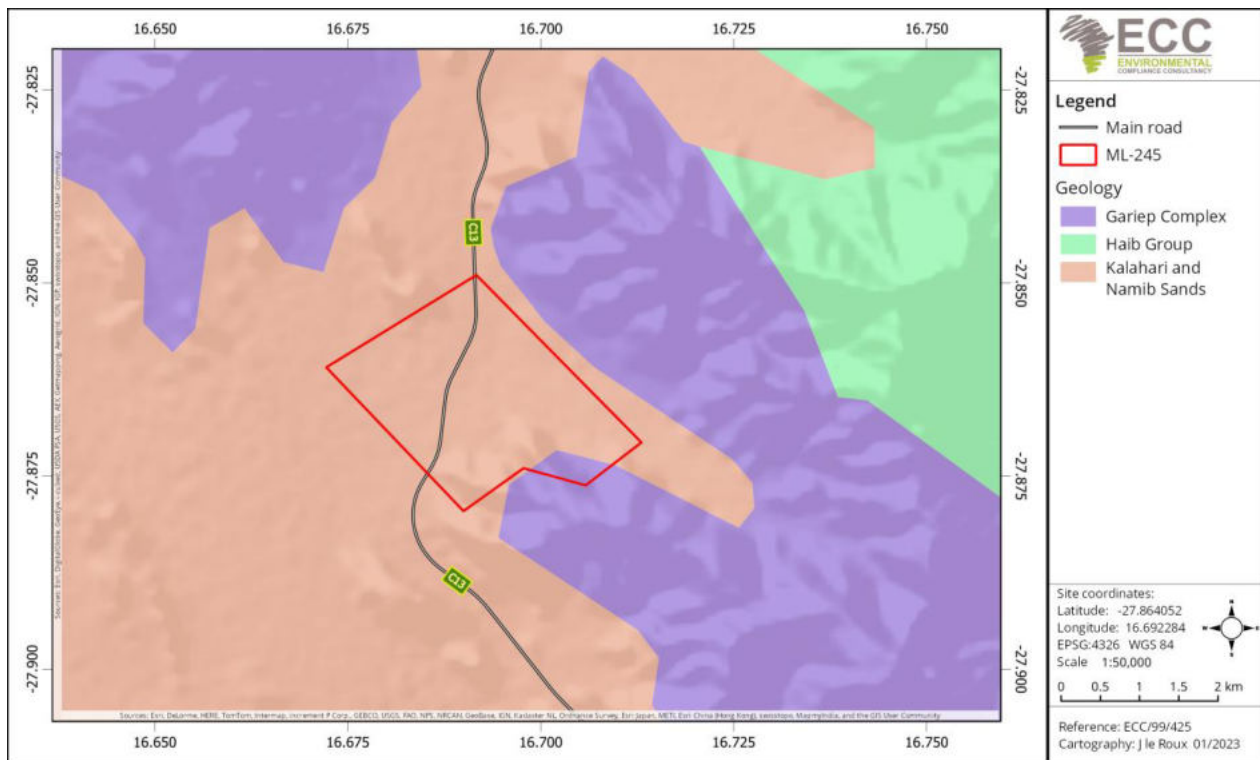


Figure 18 - Geology of ML 245

The external part of the belt, furthest east, is called the Port Nolloth Zone (PNZ), approximately 770 - 550 MA. This zone consists of continental sedimentary successions with subordinate volcanic rocks as described above. The PNZ can be interpreted as three mega-sequences:

- Continental rift deposits (Stinkfontein Subgroup)
- Passive margin deposits (Hilda Subgroup)
- Syn-orogenic deposits (Holgat Formation)

The Gergarub Deposit is situated within the PNZ, more specifically, within the Rosh Pinah Formation of the Port Nolloth Group. The Rosh Pinah Formation hosts two major producing base metal mines as well as many other mineral showings. Structurally, the deposit is situated within a failed graben Easton the eastern margin of the Gariep Basin. The graben developed during the rifting phase and was subsequently filled by the bimodal volcanism associated with the transition from rifting to drifting, as well as lacustrine- and alluvial facies sediments. Subsequently, these deposits were exposed to extreme ductile- and brittle deformation produced by the Gariep Orogeny (~545 Ma) which results in recumbent folding, shearing and thrusting. The Gergarub deposit is covered by 30 - 100 m of Tertiary overburden.

There is a distinction between concordant mineralization and discordant mineralization. Concordant ore is in-situ sediment-hosted and rhyolite- or rhyolitic hyaloclastic-hosted mineralization that formed syngenetically on or just below the seafloor. The mineralization occurs in chemically reducing environments together with small scale tectonic features indicating the exhalation of the hydrothermal fluids and precipitation of sulphides and chert onto the seafloor. Discordant ore has been transported as debris-flow and deposited within brecciated lithified volcanic and sedimentary rocks. Mass flow breccias in sulphide ore occur which indicates that these have been re-deposited together with fragments of host rocks. Some rhyolite-hosted mineralization occurs in veins and breccias as stock work feeder zones.

The mineralization is closely associated with the rhyolites, specifically rhyolite domes. There are three main mineralization types:

- The first type is disseminated mineralization with typical values of <20% sulphides with zinc grades from 2%-6% zinc. Generally, the zinc is related to Fe-rich sphalerite which typically contains 10% iron,
- The second main mineralization type it is semi-massive sulphide which is banded mineralization with typically 20% to 50% sulphides with zinc grades from 4%-12% zinc. The sphalerite typically contains 2%-7% Fe,
- The highest-grade mineralization is the massive sulphide with typically 50% to 100 % sulphides with zinc grades from 15%-45%. The massive sulphide mineralization commonly contains honey coloured sphalerite with less than 1% Fe, and chocolate- coloured sulphide which contain a higher percentage of iron.

All three types of mineralization are compositionally banded on a 1 - 10mm scale, more so in disseminated and semi-massive ore which is intercalated with quartzite, metacarbonate, and Fe-sulphides (pyrite and pyrrhotite). All sulphides have been recrystallized, with very little effect on chemistry, due to the metamorphism which the deposit has undergone.

5.9 TOPOGRAPHY AND SOIL

The area consists of plains interrupted by koppies and rocky outcrops and partly bordered by mountain slopes incised by several deep gorges (Mannheimer, 2015). The study area exhibits highly contrasting relief comprising mountainous terrains in the east, southeast, northeast and northwest with a central flat-lying area formed by the Zebrafontein Valley Drainage System (Figure 123).

Elevations range from 1 647 mamsl on Nasepberg in the northeast, to 540 mamsl in the lower Zebrafontein Valley Drainage System in the south. Elevations at the site, which is located in the south-eastern part of the Zebrafontein Valley Drainage System, range from 612 mamsl in the north, to 618 mamsl in the south, 615 mamsl in the east and to 608 mamsl in the west (Constable 2014) as shown in Figure 19.

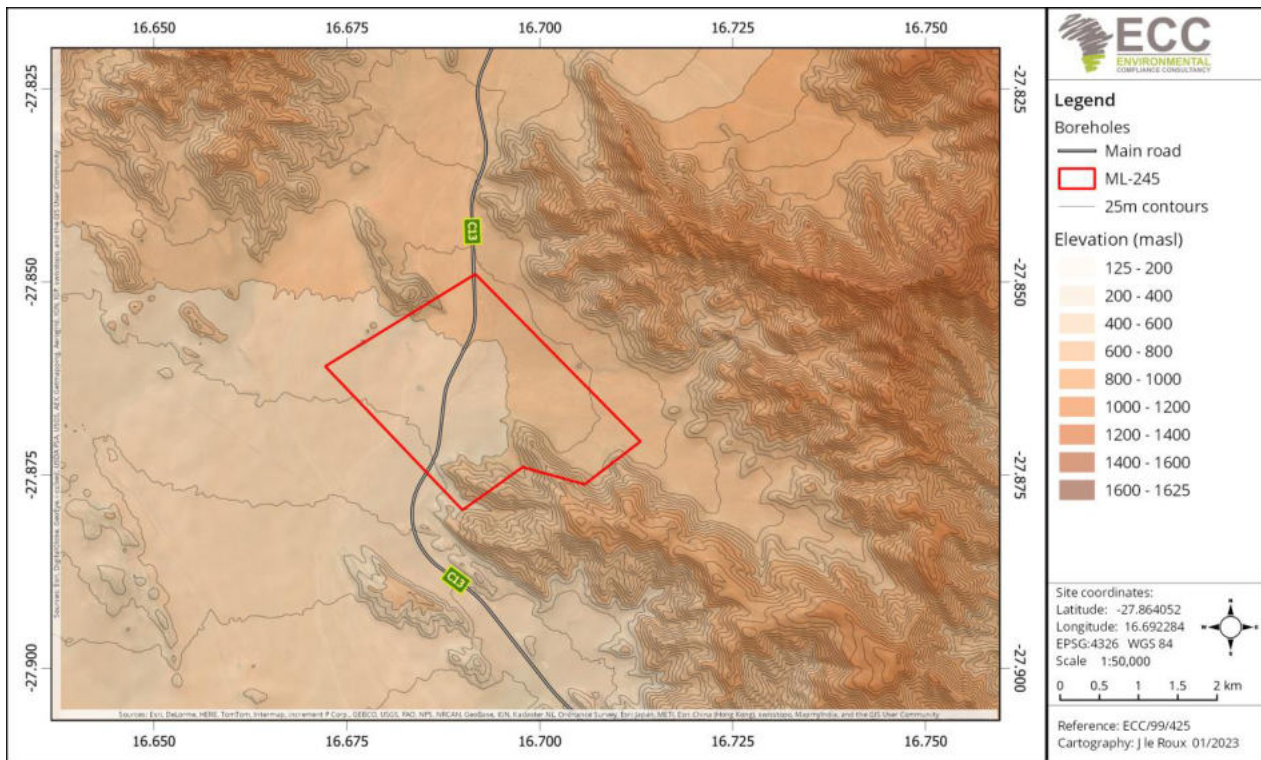


Figure 19 - Topography of ML 245

Towards the west, southwest and south the terrain flattens out into low-lying sandy plains and sand dunes of the southern Namib Desert. The area is comprised of eutric Regosols and lithic Leptosols as the dominant soil type as shown in Figure 20. Regosols are typically found in areas that have extensive eroding lands in arid and semi-arid areas and mountain regions. While Leptosols are characterised by their continuous hard rock within 25cm from the soil surface or a mollic horizon with a thickness between 10 – 25 cm directly overlying material with a calcium carbonate equivalent of more than 40 % or less than 10% fine earth from the soil surface to a depth of 75 cm.

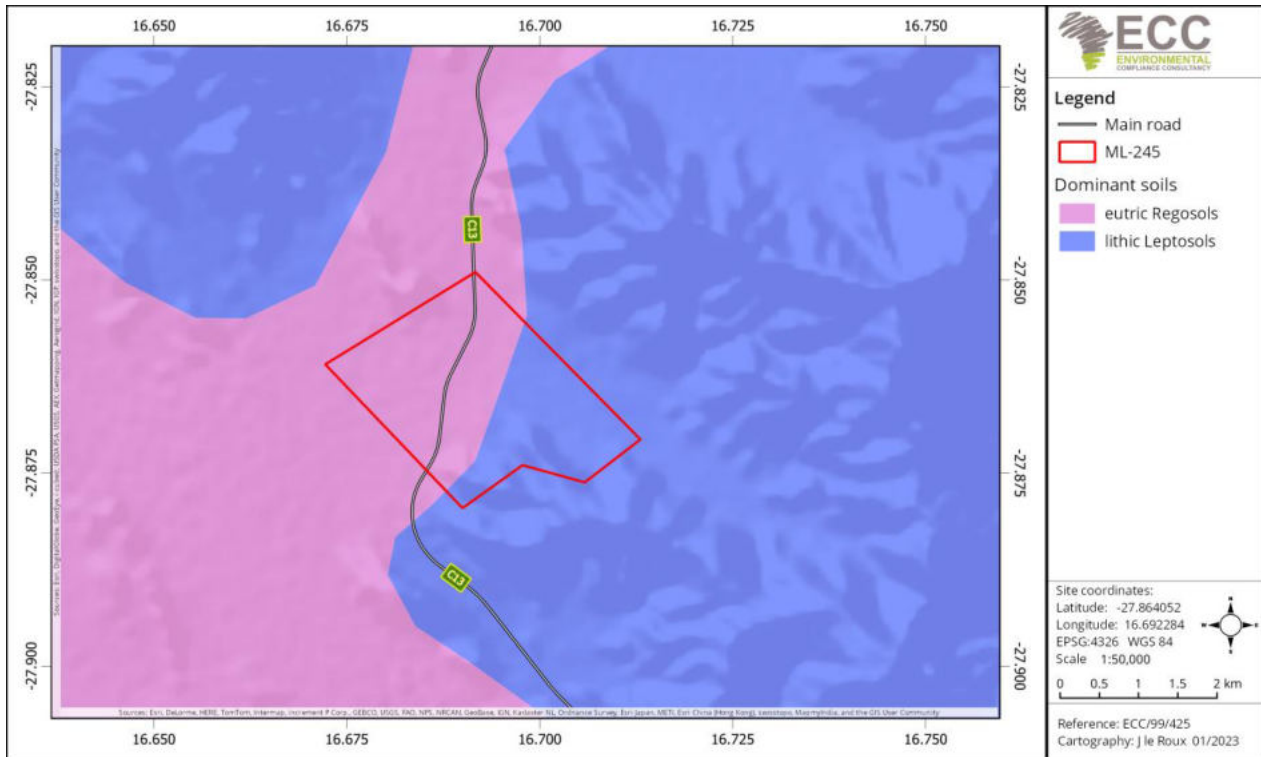


Figure 20 - Soil type of ML 245

5.10 HYDROLOGY

The prominent natural surface water in the area is the Orange River located approximately 40 km south-east of the study area. The Orange River forms the border between Namibia and South Africa and drains into the Atlantic Ocean at Alexander Bay. Any surface water impacts on the Orange River would have potential international implications.

In the localised area of the proposed Mine, surface water channels consist of a myriad of small non-perennial drainage paths randomly draining over the site and converging only where manmade culverts are constructed under existing roads, shown in Figure 21.

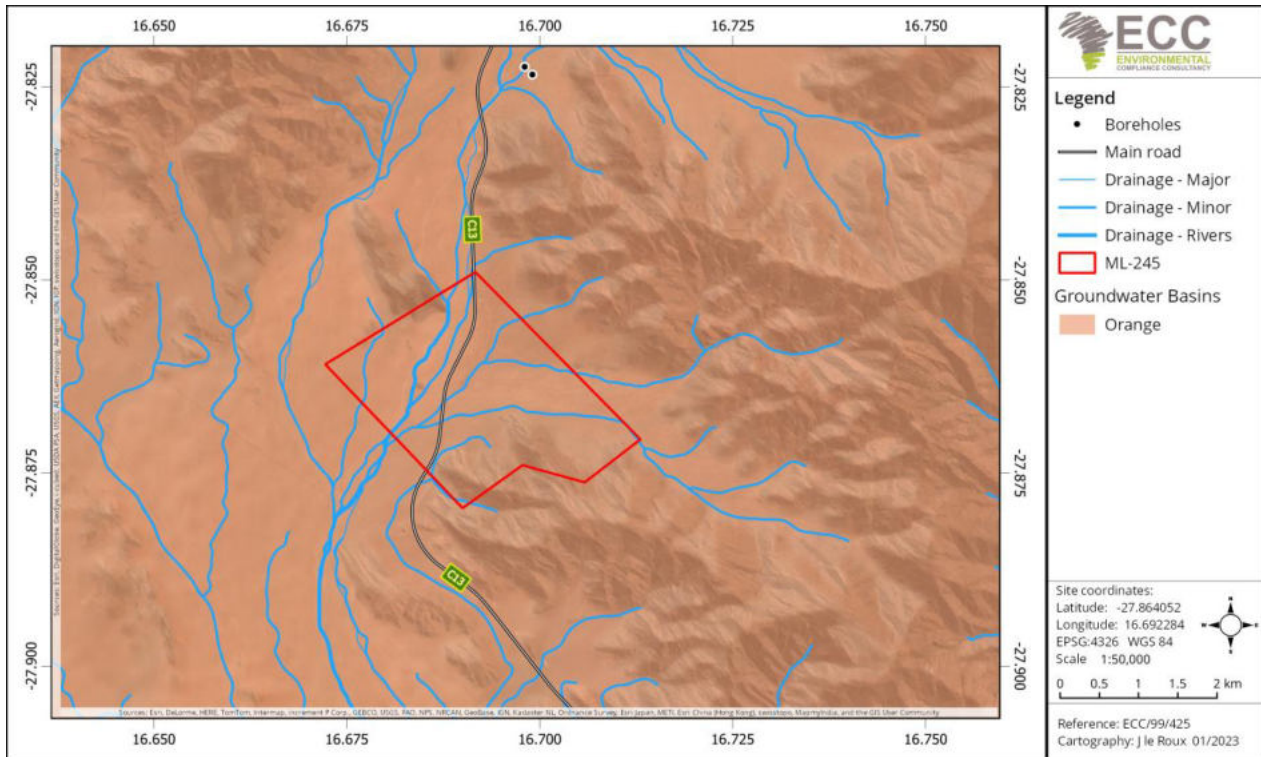


Figure 21 - Hydrological profile of ML 245

The water supplied to RPZC, SZM and Rosh Pinah Town is abstracted with pump sets in a vertical water tower and pumped to a water treatment plant for purification before it is distributed for domestic use to Rosh Pinah residents. There is also a raw water pipeline from the abstraction tower to the SZM.

Site investigations to determine the characteristics of the Gergarub mine area groundwater and aquifers were completed from April to December 2013 and included hydro census, slug tests, soil infiltration tests, geophysics, drilling, pumping tests and packer tests (SRK, 2014).

It was determined that groundwater is the sole source of water supply to the farms in the study area where small volumes (estimated at <math><10 \text{ m}^3/\text{day}/\text{borehole}</math>) are abstracted from seven boreholes for stock watering and household use.

Four hydrocensus boreholes S2-Homestead, S3-Diepkloofwell, S4-Prospect, and SW5-SüdWitputz31, situated on the adjacent properties, were accessible to measure water levels. These were 71.36, 3.21, 9.06 and 9.94 mbgl, respectively.

A comparison between the past hydrocensus data (SRK, 2007), the present indicate that water levels are stable. S3-Diepkloofwell is a shallow dug well situated close to a spring which was dry during the site visit. Based on these results it is evident that the water levels are shallower towards the north of the site. The average water level measured at the project site was 81 mbgl.

The groundwater is slightly acidic to slightly alkaline with pH ranging from 6.22 to 7.70. With the exception of iron and manganese, the metals in the water of all the boreholes sampled are very low.

Boreholes GB-GH-BH1 to -BH5 generally have good water quality with slightly elevated chloride, sulfate and sodium concentrations. Boreholes GB-GH-BH6 and -BH7 are of poorer quality with calcium, magnesium, sodium and bromide concentrations above the standards stipulated in the Namibian Water Act (Act 54 of 1956). According to the drinking water guidelines of the Namibian Water Act (1956) there are four different classes into which water quality has been grouped:

- Group A: Water with an excellent quality
- Group B: Water with acceptable quality
- Group C: Water with low health risk
- Group D: Water with a high health risk, or water unsuitable for human consumption.

The concentration of and limits for the aesthetic, physical and inorganic determinants define the group into which water will be classified. There are four water changes from borehole to borehole at the Gergarub site and are grouped accordingly:

- SPDD108, GB-GH-BH4 and -BH5 are classed in Group B indicating that the water is of 'acceptable quality';
- GB-GH-BH1, -BH2 and -BH03, SPDD005, SPDD009, SPDD058_MIN and SPDD271 are classed in Group C indicating that the water has a 'low health risk';

GB-GH-BH6 and -BH7, SPDD013 and SPDD166 are classed in Group D indicating that the water has a higher health risk or that the water is unsuitable for human consumption.

5.11 GROUNDWATER BASIN

The drainage channel/basin dominating the study area (Figure 9) drains southwards to the Orange River, but relatively permeable surface soils will negate most surface water reaching the Orange River. Potential contaminants within surface water (and emanating from the mine) are therefore likely to pose a greater risk to groundwater than to the Orange River.

The study area is situated in a valley fault zone, the Zebrafontein Fault, within the Gariiep Orogenic Belt. SRK has defined a single regional Groundwater Resource Unit (GRU) for the purposes of analysing the groundwater resource potential in the project area. The boundaries of the GRU follows likely groundwater divides (topographical highs, faults, surface water divides) so that the GRU forms a groundwater catchment area and calculations of regional water balance parameters (such as recharge) was undertaken by taking the entire catchment into account.

The area of the GRU is 639 km². The groundwater exploitation potential of the GRU was determined and is very low (82 472 m³/a). This is due to an extremely low rainfall of ~56 mm/a in combination with a low recharge potential ranging between 0.01 and 0.05 mm/a. Groundwater flow gradient.

The depth of the groundwater in the mining area ranges from ~80 to ~85 metres below ground level (mbgl). Groundwater flow is generally down the valley in a southerly direction draining towards the Orange River. The faults occurring in the study area, e.g. the Zebrafontein Fault, are likely to form preferential flow paths for groundwater movement.

5.12 BIODIVERSITY

The study area lies within a very sensitive ecological area next to the Tsau //Khaeb National Park and close to the Fish River National Park in remote southern Namibia.

The landscape surrounding the deposit is part of the northern section of the Succulent Karoo biome which is regarded as a global biodiversity hotspot (Myers, Mittermeier, Mittermeier, Da Fonseca, & Kent, 2000) shown in Figure 22 and is thus important in global as well as regional and national terms. This makes only absolutely unavoidable damage acceptable. It is extremely sensitive in terms of near-endemic, endemic and protected plant and animal species and widely recognised as an important area of both diversity and endemism.



Figure 22 - Four major life zones have been identified in the study area (Myers, Mittermeier, Mittermeier, Da Fonseca, & Kent, 2000)

These life zones have been assessed for overall ecological sensitivity based on expected diversity, occurrence of species of conservation concern, extent of habitat and recovery potential (**Error! Reference source not found.**).

Sensitivity of the various habitats was scored using ratings of 1 to 4 for the following aspects:

Species diversity: (1 = low, 4 = high)

Occurrence of species of conservation concern: (1 = low, 4 = high)

Extent of habitat: (4 = less, 1 = more)

Recovery potential: (4 = low, 1 = high)

The higher the total score is for each life zone, the more sensitive it is (Table 11).

Table 11 - Overall ecological sensitivity

Life zone	Diversity	Presence of species of concern	Extent of life zone	Recovery potential	Total
Sandy-gravelly plains	2	3	1	1	7
Stony-gravelly plains	3	2	2	1	8
Succulent plains	1	1	4	3	9
Mountains, koppies, rocky outcrops and foot slopes	4	4	3	4	15

Thirty-eight faunal taxa of potential concern were identified by John Irish (2014). These include species listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as well as protected species contained in Schedule 4 of the Nature Conservation Ordinance (No 4 of 1974).

Four species of high conservation concern have been identified. They include:

- The Namaqua Day Gecko – vulnerable because a significant amount of its Namibian range will be affected;
- The Nama Padloper – highly vulnerable species and highlighted by I&APs;
- The Karoo Korhaan and Ludwig’s Bustard - highly susceptible to population decimation through power line collisions causing many fatalities.

For a more comprehensive species list refer to Appendix C.

Similarly, Mannheimer (Irish & Mannheimer, 2013) identified 10 Red Data plant species as occurring in the study area as well as 54 protected plant species. Within the study area a number of range-restricted, endemic, near-endemic and protected species occur, including, but not limited to, *Euphorbia melanohydrata*, *Dracophilus dealbatus*, *Cheiridopsis robusta*, *Mesembryanthemum pellitum*, *Hoodia gordonii*, *Ruschia* spp. *Cephalophyllum ebracteatum*, *Aridaria noctiflora*, *Tylecodon reticulate*, *Jordaaniella cuprea*, and *Pelargonium klinghardtense*.

A detailed and annotated list of the 404 species listed for or observed in the study area during the vegetation assessment is provided in (Irish & Mannheimer, 2013), showing in which of the four habitats each species is expected, or known, to occur and indicating the known Namibian distribution of species of concern.

A discussion on how the knowledge of the different habitats were used to place the infrastructure in order to fulfil the mitigation hierarchy of avoidance, minimisation and mitigation is contained in Section 6.

Birds as an important part of the fauna of the area and may be affected by habitat destruction. Certain bird species are also prone to power line collisions, something which requires specific attention. The bird species occurring in the area that are at risk in this regard are described in the bird specialist study.

5.13 FAUNA SPECIES

The ecological functioning of the affected area is crucial to understand linkages between impacts, and to consider the natural functioning of the area as a whole. It also assists in ecological process planning for the site. These main drivers are listed below, as summarized from the rehabilitation report of African Wilderness Restoration (2014),). The footprint of the proposed mining project has increased since the biological and ecological studies were carried out and so greater attention to the drivers and sensitivities will be necessary when re assessing the impacts, mitigations, monitoring and rehabilitation considerations of the project.

5.14 SOCIO-ECONOMIC BASELINE

This baseline is taken from the socio-economic and human health impact assessments carried out by Enviro Dynamics (2015) and CSIR (2015). According to the 2011 Housing and Population Census, the population of the Karas Region has grown from 29 329 people in 2001 to an estimated 77 421 people in 2011 (National Planning Commission, 2011). This reflects a growth rate of approximately 1.1% which is lower than the national average of 1.4%. An estimated 60% of the people living in Karas were born there which reflects the large number of migrants from other areas.

Mining is a major economic activity of the Karas Region. Not only has it been key in sustaining towns such as Oranjemund and Rosh Pinah, but remittances have been generated and distributed to other parts of Namibia, and a significant contribution has been made to the national economy through the payment of royalties and taxes. Other economic activities include inputs from fishing, livestock farming, tourism, the port of Lüderitz and services to a lesser extent.

The economy of Rosh Pinah greatly revolves around the two mines. The mines are the main employers in the town and the shops serve either its employees or meet the needs of the mines

itself. Not only do these mines stimulate the economic activities of Rosh Pinah, but they also contribute significantly to the economy of the country.

The unemployment rate is very low since the greater majority of the formal town residents are employed at either of the two mines. This is higher in the informal settlement area, and it is estimated that 40% of the Tutungeni residents are unemployed (Saayman, 2013. Pers. Comm.). Those living in Tutungeni are not directly employed at the mines, but some work as domestic workers or at businesses in town. The relatives of mine workers, especially shift workers, often reside in Tutungeni. Considering the arid natural environment, the people cannot rely on natural resources for sustaining their livelihoods.

At the moment the future of the town is uncertain as the Skorpion Zinc Mine is on care and maintenance and the Rosh Pinah Mine, although with encouraging results on expansion, is being purchased by another entity. This will adversely affect the continued existence of the town which is directly reliant on the operations of the mines. The development of the Gergarub mine will thus have a significant impact on the town's sustainability. It could mean that Rosh Pinah residents laid off at the closed mines are re-employed at the new mine.

Rosh Pinah currently has one private clinic in town, a State Clinic in the neighbourhood Bethel and a Satellite State Clinic in Tutungeni. The latter mainly acts as a distribution point for tuberculosis treatment known as DOTS. The private clinic, Sidadi, provides both primary and occupational health services. The majority of the employees from the two mines make use of its services, whereas the Tutungeni community mainly visit the State Clinic in Bethel.

In 2012, SZM in partnership with the Namibian Government upgraded the facilities of the State Clinic. This clinic oversees an estimated 1 700 patients daily resulting in pressure on available staff, services and infrastructure (Movirongo, 2011).

With regards to HIV/AIDS, Sidadi currently has on record 169 positive cases, whereas there are currently more than 500 people on anti-retroviral treatment at the State Clinic. The TB cases are much lower with only 3 to 4 positive cases at Sidadi per year and 12 at the State Clinic. Respiratory diseases including asthma are not common.

The private clinic in Rosh Pinah has 2 fulltime doctors, a fulltime dentist, a physiotherapist and five senior sisters (3 emergency and 2 occupational). There are paramedics at Skorpion Zinc and employees at the mines who have been trained in first aid. In addition, specialists in different fields (such as gynaecologists and ear, nose and throat specialists) visit the clinic on a 3-monthly basis (Enviro Dynamics, 2013).

The public clinic at Tutungeni is understaffed. There is no full-time doctor and only one registered nurse and two enrolled nurses. However, the district is sponsoring one of the nurses. At times

there are also student nurses who performing their community service. Serious cases are referred to Lüderitz (Enviro Dynamics, 2013).

5.15 DEMOGRAPHIC PROFILE

Rosh Pinah has an estimated population of 7 000 people (Saayman, pers. comm (2013). Approximately half of this population resides in the formal township area, whereas the other half lives in the informal settlement area known as Tutungeni.

The organisation responsible for managing the town and the provision of services is RoshSkor. It is a Joint Venture between RPZC and SZM and maintains the infrastructure while providing water, electricity, sewerage systems and waste removal services. Water, electricity, the road infrastructure in town and especially the sewerage system has reached its full capacity and can only sufficiently deal with the existing load (Saayman, (2013). Pers. Comm.).

The formal town only expands when either of the two mines develop and appoint additional employees. With the presence of the two mines, the town is subject to an influx of job seekers. People often come to Rosh Pinah in search of a job but other than at the mines there are limited employment opportunities. Due to the aridity of the natural environment, it cannot sustain livelihoods and unsuccessful job seekers are forced to relocate eventually. The population size of the informal settlement (named Tutungeni) is thus dynamic, growing and decreasing again over time. This settlement is regulated by RoshSkor, and new residents should apply there for land occupation and access to services. Backyard squatting in Tutungeni is also limited.

Based on the fact that the town of Rosh Pinah has not expanded in the last decade and considering the average household size of four people, it is evident that there is no overcrowding. It is known that overcrowding supports the distribution of infectious diseases. It is possible however, that informal houses in certain areas may be overcrowded, although backyard squatting is illegal in Tutungeni (Enviro Dynamics, 2013). The dependency ratio in the Karas Region is relatively high at 65% (Central Bureau of Statistics, 2010). Dependency ratio is calculated as the number of people below 14 and above 65 years of age (those economically not active) as a percentage of the total population between 15 and 64 years of age.

5.16 GOVERNANCE

RPZC and Skorpion Zinc assists with the funding for projects that aim to deliver economic independence for the community. Programs include training in basic needlework; hand weaving of carpets; development initiatives in Tutungeni (a township outside of the central Rosh Pinah town), which involves the upgrade of a school, training of community members for the removal of waste and waste segregation; sanitation system maintenance; and other initiatives.

Should any of the mines cease operations and / or retract funding in the town for community development projects, there may be a risk that the inhabitants of the Rosh Pinah town will require greater funding assistance from the operating mine. All obligations are voluntary and Memorandums of Understanding (MoU) between Skorpion and RPZC allow for gradual transitions, rather than abrupt departures from existing obligations for community funding. MoU's exist to jointly fund and manage the healthcare clinic, ambulance service and two schools. Risk to the Rosh Pinah operations because of labour actions is low. A three-year labour agreement expiring on 11 March 2024 is in place in respect of all employees within the bargaining unit and this, together with the development and implementation of stakeholder management plans, will assist RPZC to manage this aspect of the operation.

The Rosh Pinah town is not proclaimed so the Namibian Government has no responsibilities for the town nor its inhabitants. There are political pressures to get the town proclaimed and it has been agreed that proclamation will occur among the stakeholders, including the Kharas Regional Council. If proclamation occurs, then RoshSkor would likely be dissolved, and the Namibian Government would assume the costs of managing the town. While this may pose some risks to ongoing service delivery, this transition would also reduce the level of cost currently incurred by RPZC in funding the management of the Rosh Pinah town (e.g., for waste collection, water, and electricity provision).

RoshSkor, the organization that manages the town, has a Board with five members (two from RPZC, two from Skorpion Zinc, and one from RoshSkor) who meet monthly and are charged with responsibility to protect the interests and quality of the town's services:

- Water is provided by NamWater and sourced from the Orange River. Groundwater is not used.
- Power supply is provided by NamPower, who purchase the electricity from Eskom in South Africa. While Eskom is facing challenges, RPZC believe that the revenue received from Namibia provides sufficient incentive for South Africa to continue making electricity available.
- Waste management:
 - Household waste is collected by contractors directly from households and disposed in landfill site; the site was on the mine but has moved to a fenced site – the current disposal cells are near-capacity, so expansion is taking place (an impact assessment has been completed and the site is licensed so this is within the permitted area). There is space in the designated area to continue operating the landfill should the LOM be extended.
 - Hazardous wastes (e.g., used oils and grease are returned to suppliers; medical waste goes to an incinerator in Lüderitz).
 - Skips are provided for large items which eliminates illegal dumping.
- Facilities include a clinic (“one stop shop” staffed by two doctors, paramedic, with an equipped pharmacy / pharmacist; specialists such as orthopaedic surgeon, audiologists,

and ear-nose- throat surgeons attend from time to time); an ambulance is available to transfer patients to hospital in Lüderitz, if required. It should be noted this clinic is not a viable business on its own and is financially supported by RPZC (N\$300 000) and Skorpion Zinc (N\$300 000) on a monthly basis.

- Two supermarkets stock food and household goods.
- Four (two Government and two Private) schools provide quality education.

5.17 CULTURAL HERITAGE

Specialist studies have determined that the Gergarub deposit is located within an area of high archaeological sensitivity. Eighteen sites have been identified within the project area (Kinahan J., 2014) as shown in Figure 23 and their locations are shown in Table 12.

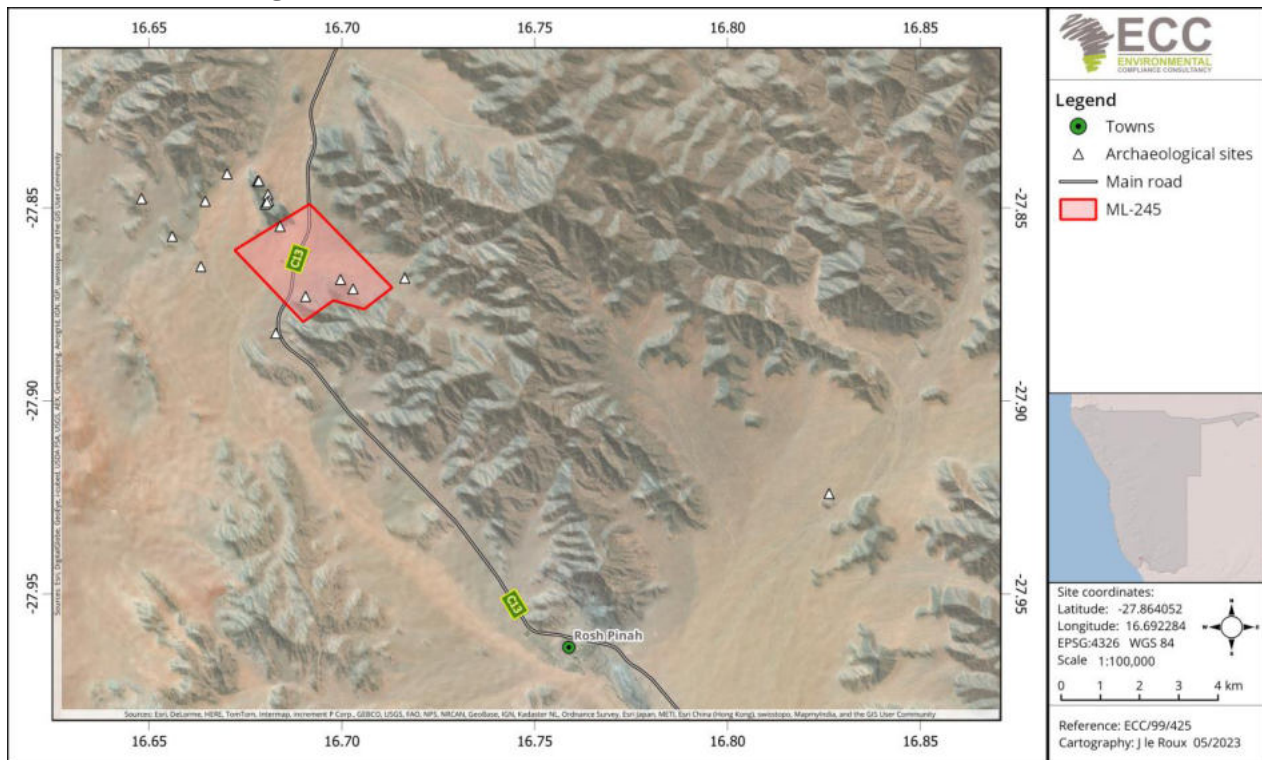


Figure 23 - Location of identified archaeological sites on ML 245

Table 12 - Types of archaeological sites and artifacts that can be observed on site.

Type Of Finding	Detail
Rock Shelters	5 sites possibly contain stratified archaeological deposits. The high concentration of rock shelters is very significant
Various Surface Scatters	Stone artefact debris; ostrich eggshell; other remains
Stone Features	Includes 2 suspected grave sites

5.18 NOISE

The following is based on personal observation by Williams (2014) during a site reconnaissance trip. The study area was surveyed and the closest sensitive human noise receptors that were

identified are the residents on the nearby farms and the residents at Rosh Pinah town 10 km away. There are several hills or mountains between the proposed mine and the town. This will be updated as part of the full impact assessment. A field study was conducted in November 2013. The results are shown in Table 13 below, this will be updated in the 2023 commissioned verification and updated noise assessment.

Table 13 - Results of noise assessment field study conducted in November 2013

Test point	Start time	Sans guideline rating limit	10103 noise	Lreq.t db(a)	Comments
TP 1 South West of Site Boundary	13:30	45		37.2	4 trucks and 3 cars on national road. Wind noise @ 2.8m/s
	21:59	35		38.1	3 trucks and 0 cars on national road. Wind noise @ 3.1m/s
TP 2 South West of Site Boundary	14:15	45		38.3	6 trucks and 2 cars on national road. Wind noise @ 2.2m/s
	22:15	35		34.5	1 truck and 1 car on national road. Wind noise @ 3.2m/s

The ambient day-noise was measured at the site and varies between 37 - 38 dB(A) which is very low in relation to SANS and EHS guidelines. The test environment contained noise sources from vehicular traffic that included trucks and cars, birds as well as wind noise.

The road noise emanating from the main road connecting Rosh Pinah and Aus, the C13, is the largest noise contributor at present and it is envisaged that the mine activities will have little additional impact.

5.19 VISUAL

The following visual receptors were identified:

- Tourist activities in the valley that is located on the farm Spitzkop 111.
- Users of the C13, due to the fact that it has become a tourist route.
- Users of the road to the SZM.

The following visual landscapes exist in the study area:

- The valley east of the C13 with the mountain range north-east to south-east of the valley.
- The valley west of the C13 with the mountain ranges west and north of the valley.

Both visual landscapes are locally valued for above average visual quality. Both the visual landscapes consist of distinct views that combine long flat valley sight distances with strong contrasting mountain views. The lack of protruding vegetation in both the valley and mountains further highlights the contrasting perception. Project activity may be evident and begin to attract attention. Structures, operations, and user activities should remain subordinate to the existing visual resources. Form, line, colour, texture, scale, and composition should be compatible to the characteristics of the existing resource.

There are very little contributing factors to the visual landscape focus. Little pollution is currently evident and there are no historical landmarks in the study area. Wildlife is not a major element but is evident in the study area.

The major industrial and human detractors to the value of the two landscapes are:

- the C13 road and the road to SZM
- the various 400 kV, 66 kV and 33 kV transmission lines that traverse the visual landscape to the west of the C13 road.

The presence of the farm infrastructure such as fencing, and tracks are considered as visual vernacular in this case and not detracting from the quality of the views.

6 IMPACT IDENTIFICATION AND EVALUATION METHODOLOGY

6.1 INTRODUCTION

Chapter 2 provides an overview of the approach used in this ESIA process, and details each of the steps undertaken to date. Prediction and evaluation of impacts is a key step in the ESIA process. This chapter outlines the methods that will be followed, in order to identify and evaluate the impacts arising from the proposed Project. The findings of the assessment will be presented in the full assessment report.

This chapter provides comprehensive details of the following:

- The assessment guidance that will be used to assess impacts.
- The limitations, uncertainties, and assumptions with regards to the assessment methodology.
- How impacts will be identified and evaluated, and how the level of significance will be derived.
- How mitigation will be applied in the assessment, and how additional mitigation will be identified.
- The cumulative impact assessment (CIA) method that will be used.

The aims of this assessment will be to determine which impacts are likely to be significant; to scope the available data and identify any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology.

The scope of the assessment was determined by undertaking a preliminary assessment of the proposed Project against the receiving environment, and was obtained through a desktop review, available site-specific literature, monitoring data, and site reports, as set out in this scoping report.

6.2 ASSESSMENT GUIDANCE

The following principal documents will be used to inform the assessment method:

- International Finance Corporation standards and models, in particular performance standard 1: 'Assessment and management of environmental and social risks and impacts' (International Finance Corporation, 2012 and 2017).
- International Finance Corporation Cumulative Impact Assessment (CIA) and Management Good Practice Handbook (International Finance Corporation, 2013).
- Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008).

6.3 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS

The following limitations and uncertainties associated with the assessment methodology will be considered in the assessment phase:

- Topic-specific assessment guidance has not been developed in Namibia. A generic assessment methodology will be applied to all topics using IFC guidance and professional judgement.
- Guidance for CIA has not been developed in Namibia, but a single accepted state of global practice has been established. The IFC's guidance document (International Finance Corporation, 2013) will be used for the CIA.

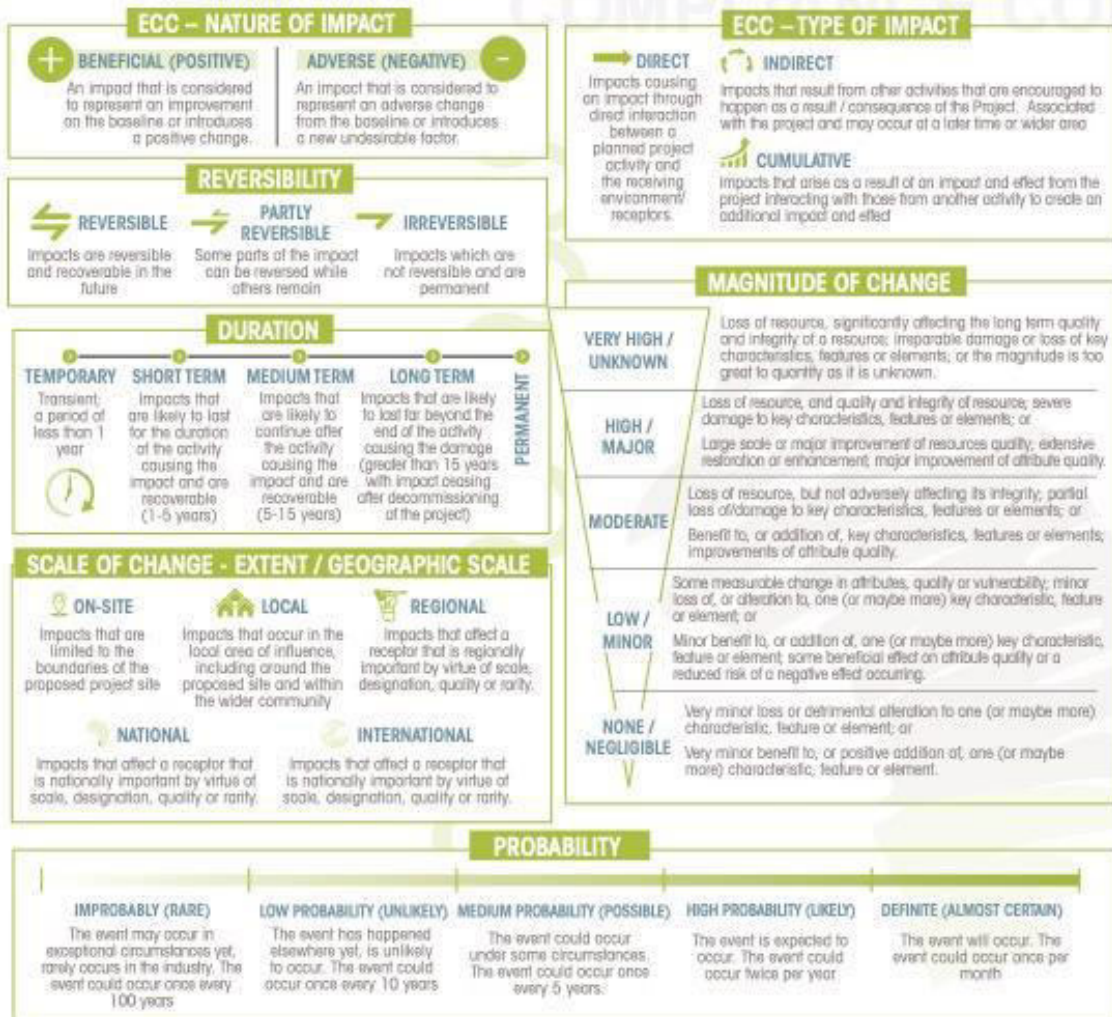
6.4 ASSESSMENT METHODOLOGY

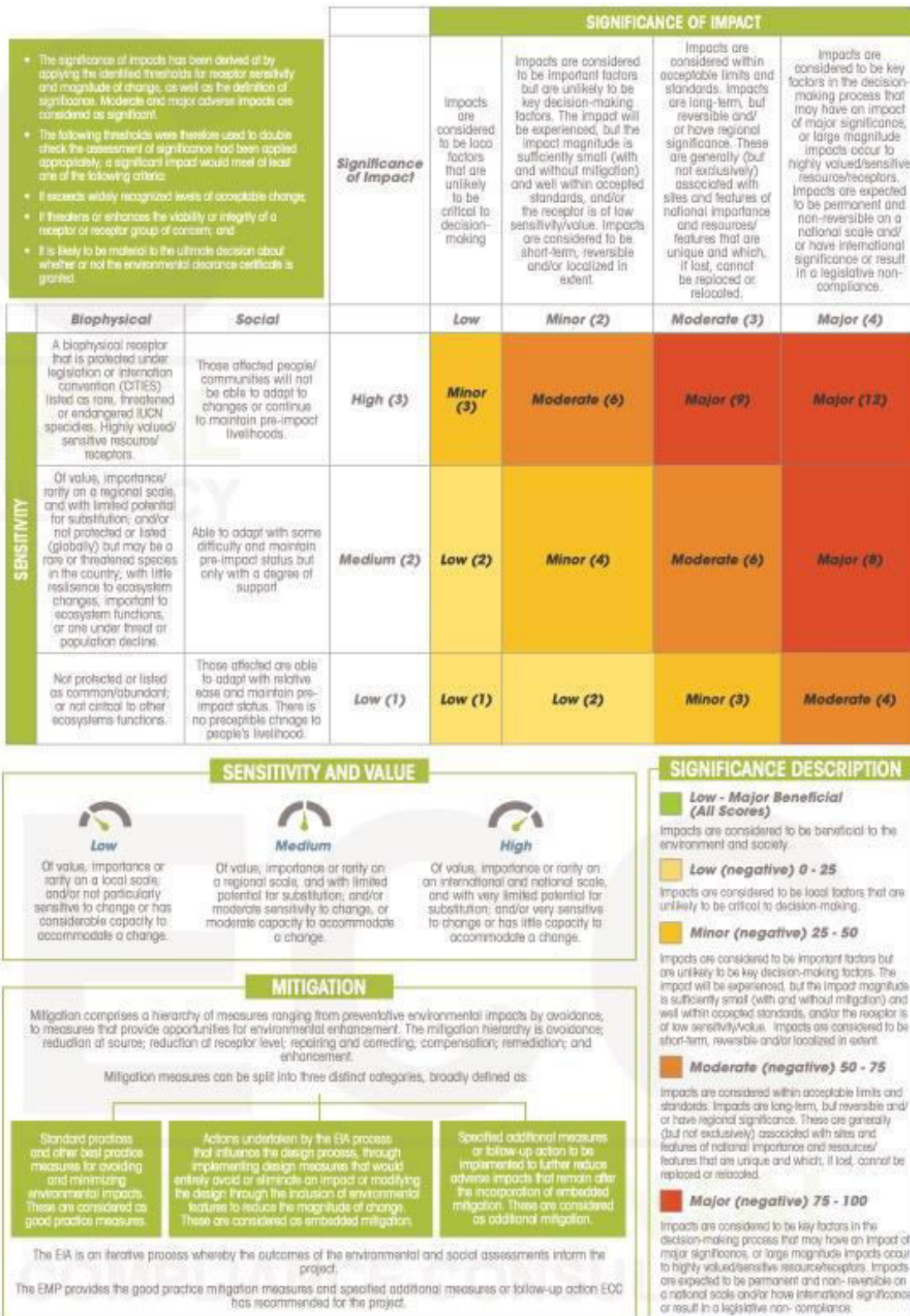
The ESIA methodology applied to this assessment has been developed by ECC using the International Finance Corporation (IFC) standards and models, in particular performance standard 1: 'Assessment and management of environmental and social risks and impacts' (International Finance Corporation, 2017); Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008); international and national best practice; and over 25 years of combined ESIA experience. The methodology is set out in Figure 24.

The evaluation and identification of the environmental and social impacts require the assessment of the Project characteristics against the baseline characteristics, ensuring that all potentially significant impacts are identified and assessed.

The significance of an impact is determined by taking into consideration the combination of the sensitivity and importance/value of environmental and social receptors that may be affected by the proposed Project, the nature and characteristics of the impact, and the magnitude of any potential change. The magnitude of change (the impact) is the identifiable changes to the existing environment that may be negligible, low, minor, moderate, high, or very high; temporary/short-term, long-term or permanent; and either beneficial or adverse.

ECC IMPACT PREDICTION AND EVALUATION METHODOLOGY





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Figure 24 - ECC ESIA methodology based on IFC standards.

6.5 CUMULATIVE IMPACTS

6.5.1 CUMULATIVE IMPACT ASSESSMENT METHOD

Cumulative impacts may arise as a result of other Project activities, or due to the combination of two or more projects in the Project area. A cumulative impact assessment (CIA) will be undertaken by applying the IFC CIA Good Practice Handbook (International Finance Corporation, 2013), which recommends that a rapid CIA is undertaken.

A rapid CIA takes into consideration the challenges associated with a good CIA process, which include a lack of basic baseline data, uncertainty associated with anticipated development, limited government capacity, and the absence of strategic regional, sectoral, or integrated resource planning schemes.

The following five-step rapid CIA process will be followed:

- Step 1: Scoping – Determine spatial and temporal boundaries
- Step 2: Scoping – Identify valued environmental and social receptors and identify reasonably foreseeable developments.
- Step 3: Determine the present condition of valued environmental and social receptors (The baseline).
- Step 4: Evaluate the significance of the cumulative impacts
- Step 5: Identify mitigation measures to avoid or reduce cumulative impacts

The following information will be applied to the assessment in line with the above steps and IFC guidance:

- The spatial and temporal boundaries of the CIA are the extent of the ML boundaries and the duration of the construction and operation phases of the proposed Project.
- Valued environmental and social receptors that may be affected.
- A review of existing and reasonable, anticipated and/or planned developments has been undertaken, which is based on the information presented in chapter 4.
- The predicted future conditions of sensitive and common environmental and social receptors have been taken into consideration in the assessment.
- The assessment findings will be presented in the assessment report and will have the CIA applied in combination with professional judgment and published environmental assessment reports.
- A review of mitigation and monitoring measures will be undertaken, with any additional ones identified.

7 IMPACT ASSESSMENT TERMS OF REFERENCE

A full environmental and social impact assessment (ESIA) is required for a mining operation like Gergarub Mining Project. The scope of work for the impact assessment report is defined with due consideration of the range of potential impacts to be identified resulting from the proposed mining operations on ML 245 as outlined in the BID. As well as consideration of the concerns/comments raised through the public and stakeholder engagements proposed by the proponent.

The objectives of the ESIA:

- To address the issues and concerns raised by authorities, the public (both interested and affected parties) and the specialist consultants through the public consultation and scoping process.
- To identify and evaluate actual and potential impacts resulting from the Project and processing operations on ML 245 that potentially may influence the receiving environment.
- To recommend management, mitigation and monitoring programmes to be implemented before and during mining.
- To define an appropriate environmental and social management plan for the proposed operations on ML 245

Various specialist studies will be undertaken, previous assessment studies will be reviewed and reassessed based on the findings from the public participation phase and any changes in the project scope in the time since the previous studies were completed. A final ESMP will be produced to manage residual impacts that cannot be mitigated through the Project evolution process.

The scope of the ESIA report that will be developed will comprise an updated impact assessment in two primary components based on both existing and new data from related specialist studies as noted below. The terms of references (ToR) for the various studies are described within this chapter.

7.1 GROUNDWATER AND SURFACE WATER ASSESSMENT

To assess the potential hydrology and hydrogeological issues relevant to the Project and assess the significance of the operational and environmental impacts that the Project may have on the hydrological and hydrogeological environments at and beyond the proposed site (ML 245). To investigate an optional source of groundwater external to the ML as a water supply source including general comments.

Scope of Work:

- To prepare a detailed surface and groundwater updated assessment report that will entail:

- A review of the existing information on the revised mine layout and associated surface and groundwater documents, including a review of design recommendations for ground and surface water control measures.
- A revision of the groundwater impact assessment for the updated mining layout as part of the amended ESIA report including a revision of the current groundwater model.
- Revise the surface water impact assessment for the updated mining layout (as provided by the Proponent) as part of the amended ESIA report including revision of the current stormwater management plan.

To prepare detailed surface water and groundwater impact assessment along with recommended mitigation (where required), to be incorporated into the ESMP.

7.2 NOISE ASSESSMENT

Scope of work:

The assessment should include a study of the effects of noise from various sources on the biophysical and social environments on and surrounding the proposed mine site including the C13 road.

7.3 AIR QUALITY ASSESSMENT

Scope of work:

The assessment should include a study of the legal requirements pertaining to air quality applicable to international legal guidelines, limits and dust control regulations. The assessment should also include a desktop review of all available project data, including meteorological data, previous air quality assessments, EIAs, and technical air quality data and modelled results.

7.4 MINE -INDUCED BLAST AND VIBRATION ASSESSMENT

The blast and vibration impact assessment will detail the potential impacts associated with the proposed mining activities and will be completed as follows:

Scope of work:

- If available, vibration level records from past blasting activities that may have potentially been measured on-site may be used to identify potential impact zones within and adjacent to the mining licence; and
- Propose mitigation measures, as necessary.

7.5 TRAFFIC ASSESSMENT

A traffic assessment will be commissioned to assess the implications relevant to the project with regards to the current C13 road which is expected to be used as the official Gergarub mine access route.

Scope of Work:

The increase in traffic volume from the proposed project also needs to be evaluated, to see whether the C13 route would be able to manage an increase in traffic volume from the proposed Project and existing surrounding receptors. The deliverables include:

- Receptor identification
- Baseline traffic assessment
- Mitigation and control recommendations
- Alternative options

7.6 SOCIO-ECONOMIC ASSESSMENT

A socio-economic study will be conducted in-house to assess the impact of the current project along with cumulative impacts from the other active mines in Rosh Pinah on the current socio-economic state of the town and its inhabitants.

Scope of work:

The assessment will look at the impact of the project associated with an influx of workers and an increase in the population of the town, an increase in services that may be required and an increase in revenue in the town due to an increase in the number of jobs. It will also look at housing and accommodation and how that will be affected by the Project. The deliverables include:

- Receptor identification
- Baseline socio-economic assessment
- Mitigation recommendations
- Alternative options

8 CONCLUSION

This draft scoping report provides the baseline data for the assessment phase of the ESIA. ECC will carry out an in-depth environmental and social impact assessment to ensure that all potentially significant impacts that may occur during the Project are identified.

These potential impacts will then be further analysed to establish mitigation and best practice methods to protect the environment and avoid unforeseen effects and environmental disturbances. These mitigation and best practice managing methods which will then be outlined in a detailed environmental management plan.

The likely studies to be completed for the proposed project assessment may include those set out in Table 14.

Table 14 - Baseline studies to be completed for the Project

STUDY AREA	PURPOSE
Terrestrial ecology	<ul style="list-style-type: none"> – Biodiversity and habitat – Identification of species of concern and sensitive areas – Impacts of mining construction and operations on habitats and biodiversity
Hydrology	<ul style="list-style-type: none"> – Water supply – Storm protection – Impact on downstream users – Clean and dirty water management systems
Air quality	<ul style="list-style-type: none"> – Provide emission standards and dust suppression requirements. – Assess prevailing wind directions and possible effects of emissions on the process and/or personnel. – Model potential air quality impacts
Noise and sense of place	<ul style="list-style-type: none"> – Identification of possible receptors, and assess levels of noise to which they may be exposed during construction and operations
Soils and land use	<ul style="list-style-type: none"> – Assess existing land use and potential impacts on surrounding land users. – A soil study informs the quality and quantity of material available for rehabilitation to a similar state on close
Traffic	<ul style="list-style-type: none"> – This will focus on the potential traffic impacts and loading on routes associated with the mining activities – Assessing the capacity of infrastructure and safety aspects of the mine entrance

STUDY AREA	PURPOSE
Heritage and Culture	– A heritage assessment is required, to comply with the Namibian National legislature.
Visual	– Assessing the potential visual impacts of the proposed project on the receiving environment
Blast and Vibration	– Assessing the impact of blasting on receptors in the area
Socio-economic	– Assessing the impacts of Project on the social fabric and local economy of the town of Rosh Pinah

Findings from the ESIA process will be clearly reported in the ESIA and EMP ready for public, stakeholders, competent authorities, and government review for a record of decision.

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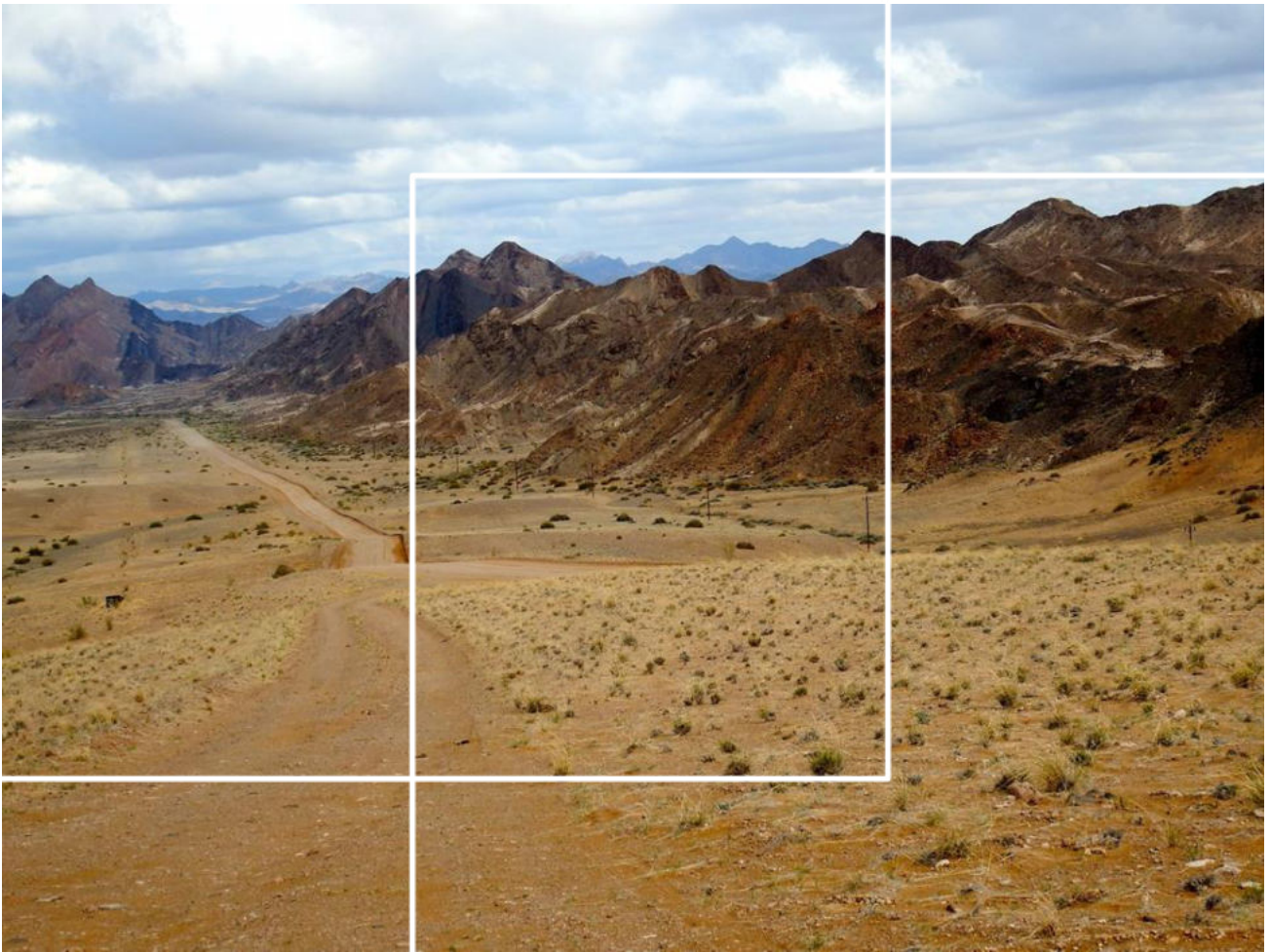
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APPENDIX A – ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX B – PUBLIC CONSULTATION DOCUMENT

APPENDIX C – SPECIES LIST

APPENDIX D – EAP CVS



Submitted to: Gergarub Exploration and Mining (Pty) Ltd.
Attention: Ms Sheron Kaviua
P O Box 90757
Windhoek,
Namibia

REPORT:

GERGARUB PROJECT ON ML 245 – PRELIMINARY ESMP

PROJECT NUMBER: ECC-99-425-REP-06-D

REPORT VERSION: REV 01

DATE: 19 JULY 2023

Prepared by:



TITLE AND APPROVAL PAGE

Project Name:	Gergarub Project on ML 245 – Preliminary ESMP
Client Company Name:	Gergarub Exploration and Mining (Pty) Ltd.
Client Name:	Ms Sheron Kaviua
Ministry Reference:	APP-000785
Status of Report:	Final for Public Review
Project Number:	ECC-99-425-REP-06-D
Date of issue:	19 July 2023
Review Period	19 July 2023 – 7 August 2023

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DISCLAIMER

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DEFINITIONS AND ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
%	Percentage
AFP	African Pioneer PLC
ASTM	American Society for Testing and Materials
CSI	corporate social investment
DWA	Department of Water Affairs
ECC	Environmental Compliance Consultancy
ECO	environmental compliance officer
EM	environmental manager
EMA	Environmental Management Act
ESMP	environmental and social management plan
EMS	environmental management system
EPL	exploration prospecting licence
ESIA	environmental and social impact assessment
FMEA	failure mode effects analysis
GHG	greenhouse gases
GIS	geographic information system
GPS	global positioning system
HazID	hazard identification
HazOp	hazardous operations analysis
HR	human resources
HSE	health, safety and environment
JV	joint venture
LOM	life of mine
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ML	mining licence
MSDS	material safety data sheet
NHC	National Heritage Council [of Namibia]
PM _{2.5}	particulate matter with a diameter of 2.5 microns or less
PM ₁₀	particulate matter with a diameter of 10 microns or less
PM	particulate matter
PPE	personal protective equipment
PV	Photovoltaic
NHC	National Heritage Council
ROM	run of mine [muck – either ore or waste rock]

ABBREVIATIONS	DESCRIPTION
SOP	standard operating procedure
ToR	terms of reference
TSF	tailings storage facility
TSP	total suspended particles
WRD	waste rock dump

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Environmental Compliance Consultancy (ECC) has been retained by Gergarub Exploration and Mining (Pty) Ltd which is a joint venture (JV) owned by Skorpion Mining Company Pty Ltd (51%) and Rosh Pinah Zinc Corporation (49%). ECC is conducting an environmental and social impact assessment (ESIA) for the proposed mining of precious metals on a mining licence (ML) area (ML 245). The licence is located on Exclusive Prospecting Licence 2616 (EPL 2616), in the Oranjemund Constituency, 15 km north of the town of Rosh Pinah in the Karas Region, Namibia shown in Figure 1.

ECC has compiled this draft environmental and social management plan (ESMP) in terms of the Environmental Management Act (EMA), No. 7 of 2007 and its associated Regulations of 2012. The purpose of this draft ESMP is to support the full environmental and social impact assessment (ESIA) report.

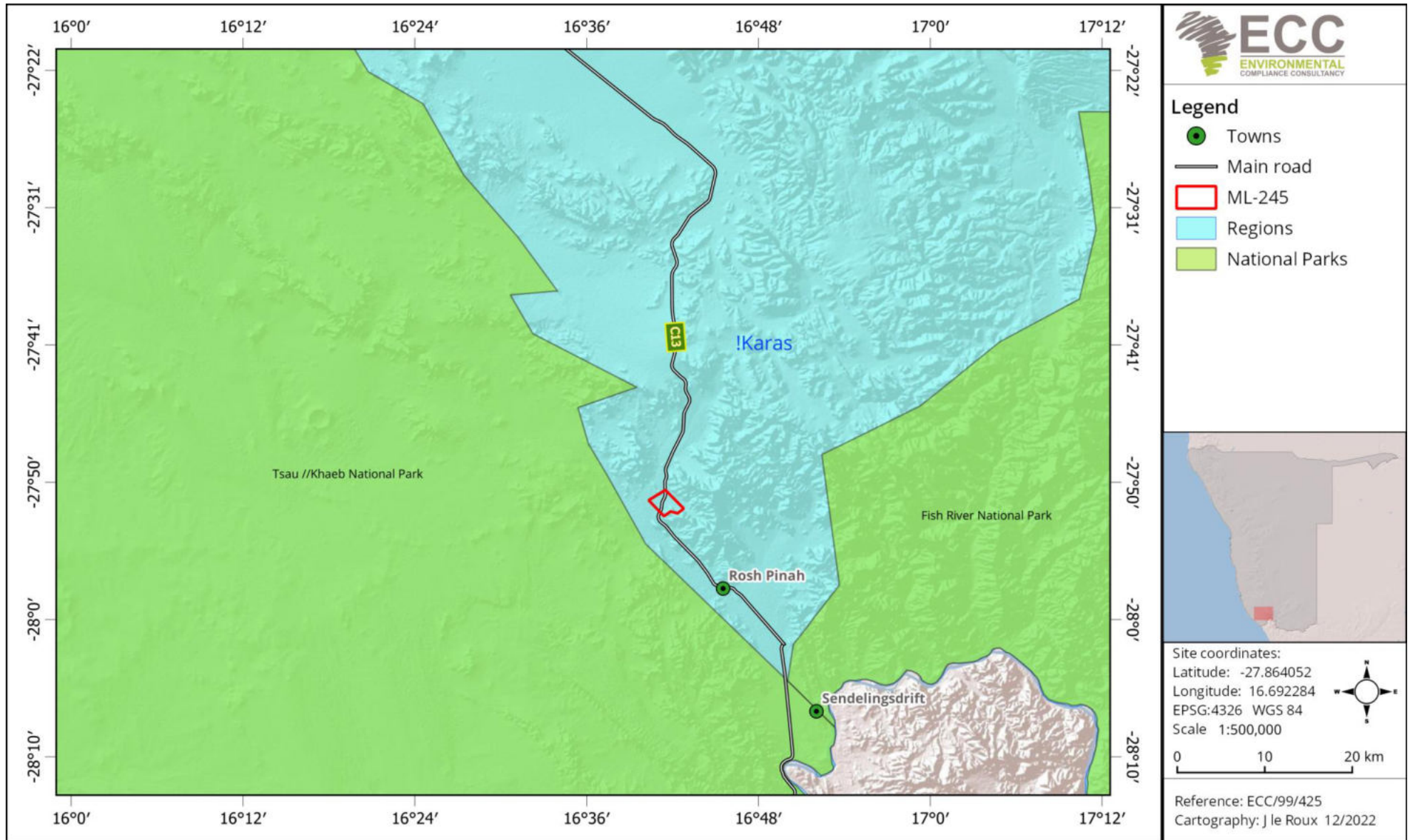


Figure 1 - Locality map showing the location of the proposed Gergarub Project

1.2 ENVIRONMENTAL REGULATORY REQUIREMENTS

The proposed project is considered as a listed activity as stipulated in the Environmental Management Act, No. 7 of 2007 and its Regulations, promulgated in 2012. An environmental scoping report, environmental impact assessment (EIA) and environmental management plan (ESMP) are required to be submitted as part of the application to support the decision-making process for issuing an environmental clearance certificate.

This report presents the ESMP and has been undertaken in terms of the requirements of the Environmental Management Act, 2007 and its Regulations.

1.3 PURPOSE AND SCOPE OF THIS REPORT

The preliminary environmental and social management plan (hereafter referred to as the ESMP) provides a logical framework, mitigation measures and management strategies for the mining activities associated with the proposed Project, in this way ensuring that the potential environmental and social impacts are curbed and minimised as far as practically possible and that statutory and other legal obligations are adhered to and fulfilled. Outlined in the ESMP are the protocols, procedures and roles and responsibilities to ensure the management arrangements are effectively and appropriately implemented.

The ESMP forms an appendix to the environmental scoping report and is based on the findings of the assessments carried out to date. The environmental scoping report should be referred to, for further information on the proposed Project, assessment methodology and terms of reference (ToR), applicable legislation, and assessment findings.

This ESMP is a live document and shall be reviewed at predetermined intervals, and or updated during the ESIA process when or if the scope of work alters, or when further data or information is added. All personnel working on the Project will be legally required to comply with the requirements set out in the final draft ESMP that is approved by the competent authorities and Ministry of Environment, Forestry and Tourism (MEFT).

The scope of this ESMP includes all activities associated with the Gergarub mining undertaking.

1.4 MANAGEMENT OF THIS ESMP

The Proponent will hold the environmental clearance certificate for the proposed Project and will be responsible for the implementation and management of this ESMP. Before the mining activities commence, this ESMP will be reviewed, amended as required and approved ready for implementation. The implementation and management of this ESMP, and thus the monitoring of compliance, will be undertaken through daily duties and activities, as well as monthly inspections. The respective compliance summary reports will be prepared and submitted biannually and will form the basis of any clearance certificate renewals.

1.5 LIMITATIONS, UNCERTAINTIES, AND ASSUMPTIONS RELATED TO THIS ESMP

This ESMP does not include measures for compliance with statutory occupational health and safety requirements. This will be provided in the safety management plan to be developed by the Proponent.

Where there is any conflict between the provisions of this ESMP and any contractor's obligations under their respective contracts, including statutory requirements (such as licences, project approval conditions, permits, standards, guidelines, and relevant laws), the contract should be amended, and statutory requirements are to take precedence.

The information contained in this ESMP has been based on the project description as provided in the ESIA report. Where the design or construction methods are different, this ESMP may require updating and potential further assessment may be undertaken.

1.6 ENVIRONMENTAL ASSESSMENT PRACTITIONER

The report has been prepared by Environmental Compliance Consultancy Pty Ltd (ECC) (Reg. No. 2022/0593) on behalf of the Proponent. Authored by ECC employees with no material interest in the report's outcome, ECC maintains independence from the Proponent and has no financial interest in the Project apart from fair remuneration for professional fees. Payment of fees is not contingent on the report's results or any government decision. ECC members or employees are not, and do not intend to be, employed by the Proponent, nor do they hold any shareholding in the Project. Personal views expressed by the writer may not reflect ECC or its client's views. The environmental report's information is based on the best available data and professional judgment at the time of writing. However, please note that environmental conditions can change rapidly, and the accuracy, completeness, or currency of the information cannot be guaranteed.

All compliance and regulatory requirements regarding this report should be forwarded by email or posted to the following address:

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2 ENVIRONMENTAL MANAGEMENT FRAMEWORK

This ESMP provides measures, guidelines, and procedures for managing and mitigating potential environmental impacts. The ESMP also indicates monitoring and reporting guidelines and sets responsibilities for those carrying out management and mitigation measures.

2.1 OBJECTIVES AND TARGETS

Environmental objectives and targets have been developed so that mining activities can minimise potential impacts on the environment, as far as reasonably practicable.

Environmental objectives for the project are as follows:

- Zero pollution incidents;
- Minimal vegetation clearing and earthworks;
- Minimal impact on regional groundwater users;
- Protect local flora and fauna, and
- Use natural resources effectively and efficiently.

2.2 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

The proponent shall provide a project team to oversee and undertake the preparation and mining activities, which will be composed of the proponent's personnel and contractors. A nominated role shall be identified to ensure the management and implementation of this ESMP is carried out throughout the Project Life of Mine (LOM). The proponent shall be responsible for:

- Ensuring all members of the project team, including contractors, comply with the procedures set out in this ESMP
- Ensuring that all persons are provided with sufficient training, supervision, and instruction to fulfil this requirement
- Ensuring that any persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood
- Contractors shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this ESMP, and meet the responsibilities listed above

Table 1 lists the roles and responsibilities allocated to different management levels in the company and specific personnel.

Table 1 – Roles and responsibilities

ROLE	RESPONSIBILITIES AND DUTIES
Proponent	<ul style="list-style-type: none"> - Responsible for the overall management and implementation of the ESMP; - Ensure environmental policies are drafted/updated and communicated to all personnel throughout the company; - Responsible for providing the resources required to effectively run the mine and comply with the ESMP;

ROLE	RESPONSIBILITIES AND DUTIES
	<ul style="list-style-type: none"> - Appoint all managers needed to ensure effective running of the mine; and - Ensure systems for proper induction and training of personnel and contractors are in place.
Mining management	<ul style="list-style-type: none"> - Manage all activities on the mine; - Monitor daily operations and ensure systems are in place for implementation of the ESMP; - Maintain the community issues and concerns register and keep records of complaints; - Ensure corrective action are taken and communicated to complainants; and - Maintain up to date records of employees who have completed training and induction.
Site manager	<ul style="list-style-type: none"> - Ensure that all contract workers, sub-contractors and visitors to the site are aware of the requirements of this ESMP, relevant to their roles and always adhere to this ESMP - Report any non-compliance or accidents - Receive, recording and responding to complaints - Ensure adequate resources are available for the implementation of the ESMP - Ensure safe and environmentally sound operations - Responsible for the management, maintenance, and revisions of this ESMP.
HSE Appointed Person	<ul style="list-style-type: none"> - Maintain the mine’s EMS - Draft and update mine specific environmental procedures - Ensure on-mine induction training is relevant and address issues from this ESMP - Do all environmental audits and inspections and report findings to relevant personnel - Check the implementation of corrective action for incidents and complaints - Ensure all environmental monitoring and reporting is done - Conduct environmental monitoring, audits and inspections; and - Compile draft environmental reports.
Employees	<ul style="list-style-type: none"> - Adhere to measures set out in the ESMP - Ensure they have undertaken a site induction - Report any operations or conditions which deviate from the ESMP as well as any non-compliant issues or accidents to the Environmental Manager

2.3 CONTRACTORS

Any contractors hired during the mining activities of the underground operations and accessory works for the Project duration shall be compliant with this ESMP and shall be responsible for the following:

- Undertaking activities in accordance with this ESMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements.
- Implementing appropriate environmental and safety management measures.
- Reporting of environmental issues, including actual or potential environmental incidents and hazards, to the site manager.
- Ensuring appropriate corrective or remedial action is taken to address all environmental hazards and incidents reported by Employees and subcontractors.

2.4 EMPLOYMENT

The proponent and all contractors shall comply with the requirements of the Republic of Namibia Regulations for Labour, Health and Safety, and any amendments to these regulations. The following shall be complied with:

- In liaison with local government and community authorities, the proponent shall ensure that local people have access to information about job opportunities and are considered first for construction/maintenance contract employment positions.
- The number of job opportunities shall be made known together with the associated skills and qualifications.
- The maximum length of time the job is likely to last for shall be indicated.
- Foreign workers with no proof of permanent legal residence shall not be hired.
- Every effort shall be made to recruit from the group of unemployed workers living in the surrounding area.

2.5 REGISTER OF ENVIRONMENTAL RISKS AND ISSUES

An environmental review of the proposed Project has been completed to identify all the commitments and agreements made. A list of environmental commitments and risks has been produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the mining phase.

Table 2 provides a list of environmental risks and issues, as well as associated mitigation (as derived from the ESIA) and monitoring measures, and the roles responsible for compliance. It will be subject to regular review by the General Manager and updated when necessary. The Mining Manager and Environmental Manager will use this register to undertake monthly inspections (see next section) to ensure the project is compliant with this ESMP.

Table 2 – A list of environmental risks and issues, as well as associated mitigation and monitoring measures for construction.

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
Employee health and safety	Construction phase injury on duty	<ul style="list-style-type: none"> - Comply with all legislation with regards to health and safety. - Provision of all required personal protective equipment (PPE). - Appropriate signage and demarcation of hazards including construction, works, excavations and operational areas. - Appointment of a health and safety representative for each construction crew. - Adequate first aid training to be provided for a health and safety representative. - Adequate emergency procedures to be developed and communicated to all labourers on site. All visitors to the construction site to undergo health and safety induction. - Adequate emergency procedure training and testing - Public signage and notification of any project related hazards which may result in loss or injury of the public or community members. - Applicable provisions to facility a safe and healthy work environment including provisions pertaining to lightning, ventilation, water provision, and easy access to medical and fire extinguishing resources. - Develop a hazard materials management plan using internationally accepted methodologies such as hazardous operations analysis (hazop), failure mode and effects analysis (fmea), and hazard identification (hazid) as per environmental, health, and safety (HSE). 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Site manager - Environmental manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
		<ul style="list-style-type: none"> - The following areas should be demarcated with danger tape: - Excavated areas; - Scaffolding areas, and - Temporary waste stockpiles - Additional warning signage should be provided in areas of movement and in “no personnel” areas where workers are not active. - All construction and mining materials and equipment should be stored only within set out and clearly demarcated work areas. - Only construction personnel should be allowed within work areas. - Fire extinguishers should always be available within the construction site and the construction campsite. - Fire extinguisher inspection (monthly) and training required 		
Training and awareness	Lack of environmental knowledge on ESMP requirements leads to environmental incidents	<ul style="list-style-type: none"> - Environmental department to provide weekly information regarding environmental issues of concern; - Line management to discuss topics with teams; - HSE staff will be Employed by contractor staff to brief staff on their company she topics and those of the proponent; - Awareness will be distributed by various channels as deemed appropriate; - Daily site inspections to ensure HSE requirements are adhered to; <ul style="list-style-type: none"> o HSE files to be maintained per shift; and o Incident reports covering HSE to be included, including lessons learned and corrective actions. 	<ul style="list-style-type: none"> - EM to request attendance registers be completed by all personnel and contractors’ construction crew attending induction training sessions - Environmental audits and inspections 	<ul style="list-style-type: none"> - Mining manager - Environmental manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
		<ul style="list-style-type: none"> - All construction personnel should undergo environmental induction (training), which should include as a minimum the following: <ul style="list-style-type: none"> o Explanation of the importance of complying with the ESMP. o Discussion of the potential environmental impacts of the construction activities. o Employees' roles and responsibilities, including emergency preparedness. o Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. o Explanation of the specific mitigation measures within this ESMP especially unfamiliar provisions. o Improve awareness of ambient air quality and consideration regarding wind speed and direction when undertaking dust generating activities. 		
Surface water	Discharges of chemicals to surface water	<ul style="list-style-type: none"> - Ensure correct chemical use and clean-up procedures are in place and followed; - Ensure chemical spills are cleaned up underground; and - Prevent spills from entering the dewatering system that would be transferred to surface. - Stormwater management measures should include clean and dirty stormwater management systems. All contaminated stormwaters should be treated or reused - Dirty water should be disposed to a dirty water holding dam / return water dam / aging pond 	- Surface water monitoring	- Environmental manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
		<ul style="list-style-type: none"> - Re-use of the water within the holding / pollution control dam for dust suppression should be implemented. - Surface water monitoring programme should be implemented. - An automatic rain gauge or weather station should be installed and maintained. 		
Groundwater	Infiltration of potential spills or discharges of chemicals into groundwater	<ul style="list-style-type: none"> - Ensure correct chemical use and clean up procedures are in place and followed for mining operations; - Bulk fuel will not be stored underground and majority of fleet refuelling will occur on surface therefore risk is reduced; and - Ensure all operators are trained on spill response for underground events. 	<ul style="list-style-type: none"> - Groundwater monitoring 	<ul style="list-style-type: none"> - Mining manager; and - Environmental manager
Soils management	Disturbance footprint management	<ul style="list-style-type: none"> - Only designated surface roads, haul roads or paved areas will be utilized; - Boundary berms to be constructed, where required; and - Topsoil to be removed, where feasible. - All topsoil should be stockpiled in a manner that will allow conservation. - The stockpiles should not exceed an angle of 30 degrees and between 2 to 3 meters in height. - All subsoil should be stockpiled separately from topsoil 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Mining manager
Socio-economic	Creation of jobs during project construction/d evelopment	<ul style="list-style-type: none"> - Ensure that local residents get first opportunity to apply for positions were applicable. 	<ul style="list-style-type: none"> - HR recruitment policies 	<ul style="list-style-type: none"> - Hr manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
	Influx of contractor (workers and families) stimulating the local economy through increase spends	<ul style="list-style-type: none"> - Engage with the local and regional government to ensure development plans cater for influx; and - Ensure local spend of corporate social investment (CSI) finding address development needs to cater for influx where applicable. 	<ul style="list-style-type: none"> - HR and CSI policies 	<ul style="list-style-type: none"> - General manager
Social	Gender based Violence	<ul style="list-style-type: none"> - Separate ablutions (toilets and showers) should be available for men and women and should clearly be indicated as such at the contractor's camp. - There should be one toilet per 15 people per gender. 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Environmental manager
Terrestrial and ecology	Protection of fauna and flora to avoid damages, injuries and/or mortalities	<ul style="list-style-type: none"> - Seed and sample collection to be done for future rehabilitation purposes; - No hunting or poaching is allowed; - No authorized removal of vegetation is allowed; - Fauna and flora incidents to be reported and recorded as per the incident management procedure; - Briefings on snakes and snake bite first aid treatments will be conducted; - Non-venomous snakes should be captured into a container and removed from site; - The killing of venomous snakes is not encouraged; and - Contact the environmental department to remove the snake should it be within the mining or construction area. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Biodiversity monitoring programme - Mine closure plan 	<ul style="list-style-type: none"> - Mining manager - Environmental manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
		<ul style="list-style-type: none"> - No off-road driving should be allowed by construction vehicles. - Movement of personnel should be restricted to work areas only. - No hunting, trapping, setting of snares or any other disturbance of any fauna species should be allowed. - No food scraps should be left on or around the construction areas. 		
	Veld fires	<ul style="list-style-type: none"> - No open fires should be made anywhere on the construction site or within the construction camp. - Designated cooking shelters should be provided at the contractor’s camp. - A fire extinguisher should be available at the cooking shelter. - A fire extinguisher should be available, in good working condition, and inspected on each company and contractor vehicle 	<ul style="list-style-type: none"> - Environmental audits and inspections - 	<ul style="list-style-type: none"> - Site manager and; - Environmental manager
Air quality	Deterioration in air quality from odour and particulate matter.	<ul style="list-style-type: none"> - Ensure mechanical equipment is maintained and serviced to ensure particulate matter is reduced. - Appropriately rated and fitted dust masks should be provided to all workers at excavation sites and for workers conducting work at dust generating activities (such as dumping of material etc). - Grey water (when available) should be used for dust suppression on stockpile heaps as well as on internal (unsealed) roads. - Dust should be suppressed by installing dust screen enclosures at site of extreme dust generating activities (such as material 	<ul style="list-style-type: none"> - Pre-shift access checklist; - Air quality monitoring; and - Personal exposure monitoring. - Data generated by the pm10 analyser and wind sensor should be monitored and documented. 	<ul style="list-style-type: none"> - Shift supervisor; - Environmental manager; and - Safety manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
		<p>cutting / dumping) or ongoing water spraying as an absolute last alternative.</p> <ul style="list-style-type: none"> - Disturbed areas of earth should be minimised by scheduling construction activities to minimise dust entrainment. - Disturbed earth surfaces should be kept moist (where practically applicable in water sufficient areas) until vegetation cover has been established. - Wind breaks should be used where feasible and applicable. - Stockpiles of building materials and earth materials should be kept moist, or the surfaces stabilised. - It is recommended that all main roads should be sealed with a chemical surfactant or watered to ensure reduced dust levels. - An appropriate height of discharge should be maintained when dust generating materials are handled through earthmoving and excavation Activities. - Limit the size of stockpiles of large quantities of soil, topsoil and other fine material. - Water sprays and dust suppression surfactants where possible should be applied during earth moving activities. - Adequate ventilation of the administrative complex and all other areas of sealed confinement should be provided. - Road signage regarding potential dust risks should be erected along the C13 national road. - The crushers and conveyor transfer points should be enclosed to capture and extract dust under negative pressure. 	<ul style="list-style-type: none"> - Location (gps and general description) of the erected dust buckets should be documented and a monitoring protocol provided. - Sampling and network maintenance of the dust buckets should be conducted, and analysis of samples should be conducted at an accredited laboratory in Namibia or South Africa mining area. - Ongoing maintenance of vehicles should be undertaken and service records should be kept. 	

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
		<ul style="list-style-type: none"> - No dumping of waste rock in extremely windy conditions (when Partials are carried beyond the mine boundary) should be conducted. - Newly dumped rock should be dosed where required. - Vehicle access to haul roads should be limited. - A programme of spraying roads routinely with water (at least twice a Day) or with chemical surfactant (at least once per day) should be implemented on all unsealed roads. - Vehicle speed on site should be restricted to 40 km/h. - A network of eight dust fallout gauges, four located at the mine’s north-eastern and north-western fence lines and four in the surrounding environment should be erected. - A PM10 analyser and wind sensor should be placed at Spitzkopwils Plaas prior to construction activities. - When complaints are received from farmers or neighbours regarding dust nuisance or noise pollution, abatement measures should be implemented. - Communication with those that complained should be continued to determine whether the problem has been adequately addressed. - No open burning of waste material or vegetation material should be allowed. - Catalytic converters and exhaust filters (if available) should be implemented on all running motors, meeting Namibian road authority specifications. 	<ul style="list-style-type: none"> - A dust complaints register should be kept 	

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
		<ul style="list-style-type: none"> - All construction vehicles should limit idling time and not be avoid overloading. 		
Noise	Increased noise levels	<ul style="list-style-type: none"> - Work hours should be strictly between 07h00 and 17h00, Monday to Saturday (excluding public holidays) when the use of heavy equipment, power tools, and the movement of heavy vehicles is less than 50 m from residential areas (especially during construction of the housing units in Rosh Pinah). In the event that this is not possible, adjacent land users need to be consulted at least a week in advance to agree on a mutually acceptable solution. Work hours at the mine to be according to agreed shift schedules as per the labour law. - Vehicles with low noise emissions should be used during construction and these vehicles should at least comply with the Namibian Road Traffic Regulations for noise level emissions. - All construction personnel should be given noise pollution sensitivity training. 	<ul style="list-style-type: none"> - Noise monitoring should be conducted along the northern site boundary of the - Ongoing maintenance of vehicles should be undertaken and service records. - A noise complaints register should be kept 	- Environmental manager
Power generation	Incorrect supply and storage of power generators results in reduced construction operations and/or	<ul style="list-style-type: none"> - Power generation will be done using diesel generators, where required; - All generators and diesel storage tanks must be contained within bund walls with a sufficient capacity (110 %) contained volume; and - Records of diesel supplied to be maintained. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Fuel records 	- Mining manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
	soil/groundwater contamination			
Domestic effluent water management	Lack of appropriate ablution facilities can result in soil contamination and pollution	<ul style="list-style-type: none"> - Only approved ablution facilities to be utilized; - Ablution facilities must be easily accessible; - No employee or contractor may relieve themselves in the surrounding environment and work area; - Ablution facilities to be cleaned and maintained on a regular basis; - Effluent water to be contained and spills to be cleaned up within 24 hours of the incident occurring; - Sewage facilities to be permitted with DWA; - Grey water to be separated from effluent water and be reused; and - Regular effluent water quality samples to be taken by the environmental department. - Portable toilets (i.e. Easily transportable) should be available at remote working areas: <ul style="list-style-type: none"> o sewage should be removed on a regular basis to the nearest official/recognised sewage treatment facility. o Workers responsible for cleaning the toilets should be provided with a protective mask and latex gloves. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Effluent monitoring programme 	<ul style="list-style-type: none"> - Mining manager - Environmental manager
Heritage sites	Loss or damage to heritage sites	<ul style="list-style-type: none"> - Chance finds to be reported to the environmental department in line with the chance finds procedure; and - No authorized removal or damage to artefacts is allowed. 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Mining manager - Environmental manager

Receptors	Potential Impacts	Management/Mitigation Measures	Monitoring Requirements	Responsibility
			<ul style="list-style-type: none"> - Archaeological monitoring programme 	
Resource use	Inefficient use of water resources	<ul style="list-style-type: none"> - Use water effectively and efficiently by following the reduce-recycle-reuse approach; and - Record volumes of abstraction and supply. 	<ul style="list-style-type: none"> - Daily observations; and - Mine water balance 	<ul style="list-style-type: none"> - Mining manager; - Environmental manager; and - Employees
Road safety		<ul style="list-style-type: none"> - Internal roads to be demarcated clearly. - Off-road driving not allowed. - All vehicles that transport materials to and from the construction site should be road-worthy. - Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. - The maximum speed on internal roads should be 40 km/h. - Loads upon vehicles should be properly secured to avoid items falling off the vehicle. 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Site manager

Table 3 - A list of environmental risks and issues, as well as associated mitigation and monitoring measures for operation.

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Employee health and safety	Construction phase injury on duty	<ul style="list-style-type: none"> - Comply with all legislation with regards to health and safety. - Provision of all required Personal Protective Equipment (PPE). - Appropriate signage and demarcation of hazards including construction, works, excavations and operational areas. 	<ul style="list-style-type: none"> - Non-compliances should be recorded and discussed at the monthly site meetings 	<ul style="list-style-type: none"> - Site manger - Environmental manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		<ul style="list-style-type: none"> - Appointment of a health and safety representative for each construction crew. - Adequate First Aid training to be provided for a health and safety representative. - Adequate emergency procedures to be developed and communicated to all labourers on site. All visitors to the construction site to undergo health and safety induction. - Public signage and notification of any project related hazards which may result in loss or injury of the public or community members. - Applicable provisions to facility a safe and healthy work environment including provisions pertaining to lightning, ventilation, water provision, and easy access to medical and fire extinguishing resources. - Develop a Hazard Materials Management Plan using internationally accepted methodologies such as Hazardous Operations Analysis (HAZOP), Failure Mode and Effects Analysis (FMEA), and Hazard Identification (HAZID) as per Environmental, Health, and Safety (EHS). 	<ul style="list-style-type: none"> - with the EM and ECO and appropriate steps taken to rectify such noncompliance's - Ongoing screening of safety signs should be conducted to ensure visibility and functionality. - A service register should be kept for the following: <ul style="list-style-type: none"> o All safety equipment o Fire extinguishers o portable toilets / ablution facilities o First Aid training certificates and attendance registers of 	

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	Underground ground control and ground support failures	<ul style="list-style-type: none"> - The Proponents safety management plan will ensure that the SOP and golden rules include that no person is to go beyond supported ground (meaning no one can go into an area of unsupported ground). Supported ground is ground that has been controlled to an approved standard and made safe; - A Ground Control Coordinator will be appointed; - A ground monitoring and control plan will be developed; - The proponent will ensure that the application of a rigorous mine design process is in place; - Prior to mining, and refined as data becomes available, the proponent will ensure a ground conditions model is developed; - Ensure that the evaluation of long-term ground control requirements is incorporated into the sites' technical plans and planning process; - Ensure that there is a multi-tiered response plan for ground support; - Ensure that all underground operators are trained in underground hazard identification; - Ensure that the site has ground control monitoring systems in place to proactively measure potential ground movement; - Ensure that the ground control requirements are incorporated into shift plans and work plans; and - Ensure that the site develops a quality assurance program for all areas of ground control/support. 	<p style="text-align: center;">representatives should be kept.</p> <ul style="list-style-type: none"> - Ground stability monitoring / Seismicity monitoring; and - Pre-shift ground condition and support checklists. 	<ul style="list-style-type: none"> - Mining Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	Underground fire incident	<ul style="list-style-type: none"> - Develop a fire control plan through the process of risk assessment; - Develop a Maintenance System to prevent the deterioration of equipment condition and performance; - Ensure no petrol is used underground; - Design and control flammable substances use and storage; - Ensure that the control of hot work through a hot work permit system is in place specifically for underground operations; - Ensure the underground operators receive training to be able to identify and provide first response to fire emergencies; - Ensure that the site has an operational and maintenance procedures for fire control; - Ensure that the design requirements for underground mobile equipment factors in fire suppression; - Ensure that the site has specific design requirements for fixed mechanical, electrical and compressor installations; - Design the ventilation system to ensure the least exposure to smoke from underground fires during evacuations; and - If associated infrastructure is required for underground operations such as workshops, lunchrooms, toilets and refuge chambers ensure these are planned and requirement designed for purpose. 	<ul style="list-style-type: none"> - HSE Audits and inspections. 	<ul style="list-style-type: none"> - Mining Manager
	Collision of underground mining equipment	<ul style="list-style-type: none"> - Ensure that procedures are in place to minimise the instances where pedestrians and operating mobile equipment are in the same area at the same time; 	<ul style="list-style-type: none"> - HSE Audits and inspections; and - Pre-start checklists on all machines. 	<ul style="list-style-type: none"> - Mining Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	causing injury to people	<ul style="list-style-type: none"> - Ensure that operational risk assessments are part of the planning process; - Develop equipment specifications which include minimum safety requirements and the identification of critical control systems for underground equipment; - Develop a maintenance system that identifies the maintenance requirements for critical safety systems; - Design requirements of all underground roads to ensure good road conditions underground are maintained; - Ensure suitable control of traffic through the development of SOPs; - Ensure the site makes provisions for the use of remote-controlled equipment to ensure high standards of safety; and - Ensure all operators understand and are trained for emergency response. 		
	Inrush or subsidence event within the underground mine causing injury and harm to people and project feasibility	<ul style="list-style-type: none"> - Ensure that due consideration of inrush and subsidence potential at each stage of a project is implemented at the planning phase; - Ensure that the use of a risk assessment process is in place to identify specific hazards; - Implement a systematic collection and analysis of data; - Evaluate of climatic conditions; - Identify risks of operating near water; - Ensure that consideration of pathways for inrushes is evaluated at each phase; - Develop, apply and monitor lead indicators; 	- Monitoring of surface and groundwater levels.	- Environmental Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		<ul style="list-style-type: none"> - Develop and apply a response plan for lead indicators - Ensure the site has implemented contingency planning; - Prior to the development of working areas ensure a Water Control Plan is developed and in place; - Apply appropriate procedures for surface and underground drilling; - Apply rigorous mine design process; - Implement effective ore and waste fill design; - Implement effective tailings and surface water storage; - Implement effective backfill design and procedures; - Implement effective underground and surface pumping and drainage systems; and - Ensure that there is a method for open and clear communication of experiences and outcomes of inrush and subsidence events. 		
	Accidental detonation of explosives	<ul style="list-style-type: none"> - Explosives should be stored in a cool, dry and access controlled environment. - Explosives should not be inserted into wet drill holes and appropriate water-resistant explosives should be used where required. - Only appropriately trained and experienced operators with adequate PPE should be allowed to handle and work with any explosives 	<ul style="list-style-type: none"> - Non-compliances should be recorded and discussed at the monthly site meetings with the EM and ECO and appropriate steps taken to rectify such recorded noncompliance's - Ongoing screening of safety signs should 	<ul style="list-style-type: none"> - Mining manager - Environmental manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
			<p>be conducted to ensure visibility and functionality.</p> <ul style="list-style-type: none"> - A service register should be kept for the following: <ul style="list-style-type: none"> o All safety equipment o Fire extinguishers 	
Training and awareness	Lack of environmental knowledge on ESMP requirements leads to environmental incidents	<ul style="list-style-type: none"> - Environmental department to provide weekly information regarding environmental issues of concern; - Line management to discuss topics with teams; - HSE staff will be Employed by contractor staff to brief staff on their company SHE topics and those of the Proponent; - Awareness will be distributed by various channels as deemed appropriate; - Daily site inspections to ensure HSE requirements are adhered to; - HSE files to be maintained per shift; and - Incident reports covering HSE to be included, including lessons learned and corrective actions. 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Mining Manager - Environmental Manager
Surface water	Sediment loading of surface water from decline	<ul style="list-style-type: none"> - Installation of diversion structures to divert non-contact surface water away from and around the mining operations; 	<ul style="list-style-type: none"> - Mine water balance 	<ul style="list-style-type: none"> - Mining Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	development activities	<ul style="list-style-type: none"> - Ensure wastewater produced during the construction of the decline development is directed into a containment pond for reuse; and - If the volume of water is too large and cannot be handled concurrently with mining operations, ensure water is diverted to the processing plant for reuse, or if not feasible, ensure an adequately sized sedimentation pond is constructed for handling the wastewater during the decline development phase, or find a suitable reuse strategy for the water. - Stormwater management measures should include clean and dirty stormwater management systems. All contaminated stormwaters should be treated or reused - Re-use of the water within the holding / pollution control dam for dust suppression should be implemented. - Surface water monitoring programme should be implemented. - An automatic rain gauge or weather station should be installed and maintained 		
	Sediment loading of surface water from uncontrolled surface discharge of underground	<ul style="list-style-type: none"> - Ensure wastewater produced from underground mining activities is sent to the processing plant for reuse in the processing plant; and - If the volume of water is too large and cannot be handled by the processing plant for reuse, ensure an adequately sized sedimentation pond is constructed for handling the wastewater from the underground mining operations. Reuse of the water back into the underground mine should be investigated once 	- Mine water balance	- Mining Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	mine wastewater	operations commence and the water quality is better known and understood.		
	Discharges of chemicals to surface water	<ul style="list-style-type: none"> - Ensure correct chemical use and clean-up procedures are in place and followed; - Ensure chemical spills are cleaned up underground; and - prevent spills from entering the dewatering system that would be transferred to surface. 	- Surface water monitoring	- Environmental Manager
	Potential failure of containment dams that hold underground mine dewatering water	- Ensure water storage facilities are constructed and have capacity to hold the volume of water to be pumped from the underground workings.	- Mine water balance	- Mining Manager
Groundwater	Contamination of groundwater from underground mining operations including hydrocarbons and explosives	<ul style="list-style-type: none"> - Ensure correct chemical use and explosive charging practices are in place and followed for mining operations; - Bulk fuel will not be stored underground, and majority of fleet refuelling will occur on surface; and - Refuelling of drills and equipment working at the face will be done in a controlled manner following standard underground refuelling procedures. 	- Groundwater monitoring	<ul style="list-style-type: none"> - Mining Manager; and - Environmental Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	Modification of hydrologic flow patterns from underground mining operations	<ul style="list-style-type: none"> - The potential to alter hydraulic flow during operations exists as the very nature of mining requires dewatering for the safe access to mining areas, the potential impact associated with dewatering require further studies. 	<ul style="list-style-type: none"> - Groundwater monitoring 	<ul style="list-style-type: none"> - Mining Manager; and - Environmental Manager
	Infiltration of potential spills or discharges of chemicals into groundwater	<ul style="list-style-type: none"> - Ensure correct chemical use and clean up procedures are in place and followed for mining operations; - Bulk fuel will not be stored underground and majority of fleet refuelling will occur on surface therefore risk is reduced; and - Ensure all operators are trained on spill response for underground events. 	<ul style="list-style-type: none"> - Groundwater monitoring 	<ul style="list-style-type: none"> - Mining Manager; and - Environmental Manager
	Potential infiltration of groundwater from aquifers into the underground mining operation	<ul style="list-style-type: none"> - Ensure that the mine plan is followed at all times; - Ensure known structures, and water bearing features are mapped and surveyed into the mine plans; - Ensure monitoring systems are in place to detect potential inflows; and - Ensure the dewatering plan is followed and monitoring and reporting on the dewatering plan is undertaken. 	<ul style="list-style-type: none"> - Groundwater monitoring; and - Mine water balance. 	<ul style="list-style-type: none"> - Mining Manager; and - Environmental Manager
	Contamination of an aquifer by the rebounding water table of potentially	<ul style="list-style-type: none"> - The mine design may allow for the groundwater level to be intersected. The mine will act as a sink of potentially contaminated water from various sources, including the rebounding water table in the underground workings; - Tracking of potential acid rock/mine drainage are required to properly decide on waste rock and tailings paste fill and related 	<ul style="list-style-type: none"> - Groundwater monitoring 	<ul style="list-style-type: none"> - Environmental Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	polluted water in the underground workings after closure	<p>handling and disposal, as well and the use of mine waters. Further test cell investigations and regular monitoring are also required for mine planning and for closure planning.</p> <ul style="list-style-type: none"> - Using the water for irrigation after closure could be an option to investigate. 		
	Potential for inrush into the underground mine workings during development and operations	<ul style="list-style-type: none"> - Ensure the dewatering plan is followed and monitoring and reporting on the dewatering plan is undertaken; - Ensure all operations are undertaken in accordance with the mine plan; - Ensure all water bearing features are mapped and included in survey plans; - Ensure emergency response procedures are in place in the event of an inrush; and - Ensure adequate pumping capacity with back up pumps as critical spares are kept on site. 	<ul style="list-style-type: none"> - Groundwater monitoring 	<ul style="list-style-type: none"> - Mining Manager; and - Environmental Manager
Stormwater management	Flood risks and pollution control	<ul style="list-style-type: none"> - A stormwater management plan to be developed for the site, in line with the ESIA requirements; - Stormwater management plan to be reviewed and updated on a regular basis; - Dirty (contact) and clean (non-contact) water to be separated; - Clean water should be allowed to enter the natural drainage channels/ephemeral river; and - Dirty water should be redirected to the ponds or processing plant to be reused in the process. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Stormwater management plan - Survey database - Stormwater monitoring programme 	<ul style="list-style-type: none"> - Mining Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Soils management	Disturbance footprint management	<ul style="list-style-type: none"> - Only designated surface roads, haul roads or paved areas will be utilized; - Boundary berms to be constructed, where required; and - Topsoil to be removed, where feasible. 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Mining Manager
Socio-economic	Creation of jobs during project construction/d development	<ul style="list-style-type: none"> - Ensure that local residents get first opportunity to apply for positions were applicable. 	<ul style="list-style-type: none"> - HR recruitment policies 	<ul style="list-style-type: none"> - HR Manager
	Creation of 20-50 jobs during operational mining	<ul style="list-style-type: none"> - Ensure that local residents get first opportunity to apply for positions were applicable. 	<ul style="list-style-type: none"> - HR recruitment policies 	<ul style="list-style-type: none"> - HR Manager
	Influx of contractor (workers and families) stimulating the local economy through increase spends	<ul style="list-style-type: none"> - Engage with the local and regional government to ensure development plans cater for influx; and - Ensure local spend of CSI finding address development needs to cater for influx where applicable. 	<ul style="list-style-type: none"> - HR and CSI policies 	<ul style="list-style-type: none"> - General Manager
	Changes to community cohesion	<ul style="list-style-type: none"> - Ensure local spend of CSI finding address development needs to cater for influx where applicable. 	<ul style="list-style-type: none"> - HR and CSI policies 	<ul style="list-style-type: none"> - General Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Terrestrial and ecology	Further reduction in the water table could affect deep rooted tree survival during droughts	<ul style="list-style-type: none"> - Monitoring groundwater levels and physiological stress levels in trees to see if a correlation exists; - Mapping trees that might be at risk using the cone of depression maps; and - Determine feasibility for rescue of these trees. 	<ul style="list-style-type: none"> - Groundwater monitoring; and - Vegetation monitoring. 	<ul style="list-style-type: none"> - Environmental Manager
	Protection of fauna and flora to avoid damages, injuries and/or mortalities	<ul style="list-style-type: none"> - Protected tree species to be identified clearly and uprooting of trees to be avoided, where possible; - Seed and sample collection to be done for future rehabilitation purposes; - No hunting or poaching is allowed; - No authorized removal of vegetation is allowed; - Fauna and flora incidents to be reported and recorded as per the incident management procedure; - Briefings on snakes and snake bite first aid treatments will be conducted; - Non-venomous snakes should be captured into a container and removed from site; - The killing of venomous snakes is not encouraged; and - Contact the Environmental department to remove the snake should it be within the mining or construction area. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Biodiversity monitoring programme - Mine closure plan 	<ul style="list-style-type: none"> - Mining manager - Environmental manager
Air quality	Deterioration in air quality from odour	<ul style="list-style-type: none"> - Ensure mechanical equipment is maintained and serviced to ensure particulate matter is reduced; and 	<ul style="list-style-type: none"> - Pre-shift access checklist; 	<ul style="list-style-type: none"> - Shift supervisor; - Environmental Manager; and

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	and particulate matter (i.e. total suspended particulate matter (TSP), PM ₁₀ and PM _{2.5} and dust deposition) from the underground operations	<ul style="list-style-type: none"> – Ensure ventilation systems are providing fresh air to working headings and the underground workings are exhausted after each blast. 	<ul style="list-style-type: none"> – Air quality monitoring; and – Personal exposure monitoring. 	<ul style="list-style-type: none"> – Safety Manager
	Ventilation discharged from the underground workings via the portal could contribute to offensive odours	<ul style="list-style-type: none"> – Implement gas monitoring procedures as part of the daily operations of the underground mine; and – Ensure adequate ventilation to prevent the build-up of odours and gas within the underground mine. 	<ul style="list-style-type: none"> – Air quality monitoring; and – Personal exposure monitoring. 	<ul style="list-style-type: none"> – Environmental Manager; and – Safety Manager
	Air quality and GHG emissions from underground	<ul style="list-style-type: none"> – Ensure mechanical equipment is maintained and serviced to ensure particulate matter is reduced; and – Ensure efficient waste handling such as backfilling to reduce haul distances and therefore reduce potential GHG emissions. 	<ul style="list-style-type: none"> – GHG emission reporting 	<ul style="list-style-type: none"> – Environmental Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	mining activities			
Noise management	Disturbance to third parties, fauna and flora	<ul style="list-style-type: none"> - Regular noise and vibration monitoring to be conducted on neighbouring farms or the perimeter of the mining licence; - To limit disturbance to neighbouring farms/landowners, hauling of material from the pit to the main mining areas/ROM, should take place during daylight hours as far as possible; and - If nighttime hauling is required, the neighbours need to be consulted. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Noise and vibration monitoring programme - Community liaison records 	<ul style="list-style-type: none"> - Mining manager - Environmental manager
Power generation	Incorrect supply and storage of power generators results in reduced mining operations and/or soil/groundwater contamination	<ul style="list-style-type: none"> - Power generation will be done using diesel generators, where required; - Lighting plants are expected to be used at night or during poor visibility; - All generators and diesel storage tanks must be contained within bund walls with a sufficient capacity (110 %) contained volume; and - Records of diesel supplied to be maintained. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Fuel records 	<ul style="list-style-type: none"> - Mining manager
Domestic effluent water management	Lack of appropriate ablution	<ul style="list-style-type: none"> - Only approved ablution facilities to be utilized; - Ablution facilities must be easily accessible; 	<ul style="list-style-type: none"> - Environmental audits and inspections 	<ul style="list-style-type: none"> - Mining manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	facilities can result in soil contamination and pollution	<ul style="list-style-type: none"> - No employee or contractor may relieve themselves in the surrounding environment and work area; - Ablution facilities to be cleaned and maintained on a regular basis; - Effluent water to be contained and spills to be cleaned up within 24 hours of the incident occurring; - Sewage facilities to be permitted with DWA; - Grey water to be separated from effluent water and be reused; and - Regular effluent water quality samples to be taken by the Environmental department. 	<ul style="list-style-type: none"> - Effluent monitoring programme 	<ul style="list-style-type: none"> - Environmental manager
Heritage sites	Loss or damage to heritage sites	<ul style="list-style-type: none"> - Chance finds to be reported to the Environmental department in line with the Chance Finds Procedure; and - No authorized removal or damage to artefacts is allowed. 	<ul style="list-style-type: none"> - Environmental audits and inspections - Archeological monitoring programme 	<ul style="list-style-type: none"> - Mining manager - Environmental manager
Resource use	Inefficient use of water resources	<ul style="list-style-type: none"> - Use water effectively and efficiently by following the reduce-recycle-reuse approach; and - Record volumes of abstraction and supply. 	<ul style="list-style-type: none"> - Daily observations; and - Mine water balance 	<ul style="list-style-type: none"> - Mining Manager; - Environmental Manager; and - Employees
	Inefficient electricity use increasing	<ul style="list-style-type: none"> - Rely on the use of a PV solar plant if appropriate or the maximum electricity supply; and 	<ul style="list-style-type: none"> - Track energy usage 	<ul style="list-style-type: none"> - Mining Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	carbon footprint	<ul style="list-style-type: none"> - Use energy efficient electrical equipment and lighting underground. 		
Road safety		<ul style="list-style-type: none"> - Internal roads to be demarcated clearly. - Off-road driving not allowed. - All vehicles that transport materials to and from the construction site should be road-worthy. - Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. - The maximum speed on internal roads should be 40 km/h. - Loads upon vehicles should be properly secured to avoid items falling off the vehicle. 	-	-

3 ENVIRONMENTAL MANAGEMENT PRINCIPLES

3.1 CONTINUAL IMPROVEMENT

The Proponent’s team is responsible for reviewing and updating this ESMP, which will be supported by the monthly reports from the Underground Mining Domains. As part of this review process, the monthly reports will be reviewed, identifying any trends or significant areas of concern, as well as measures implemented to manage / resolve environmental or social issues. Compliance and legislative changes will be reviewed, and lessons learnt will be captured. The ESMP will be amended as required, and follow up training, awareness or updates will be provided.

Ongoing hazard identification through the review of the ESMP and supporting management plans and SOPs will ensure environmental impacts are avoided or minimised to as low as reasonably practicable as part of the continuous improvement of the EMS.

3.2 BEST PRACTICE

The best practice management measures that will be complied with across site are listed in Table 4

Table 4 – A list of environmental best practice measures to be implemented

ENVIRONMENTAL ASPECT	BEST PRACTICE REQUIREMENT
Pollution prevention control	Plant and equipment to be maintained and serviced regularly; Refuelling at designated locations; Spill kits available where the risk of loss of containment is identified; Bunds to be at least 110 % of the container; and Good housekeeping.
Solid waste management	Good housekeeping (no littering); Designated waste collection areas around site and one central location; Bins labelled; Waste to be separated and kept clean and tidy; and Waste bins emptied on regular basis.
Ground contamination	Refuelling will be undertaken in designated areas with spill kits available; Chemical management enforced on site; and Good housekeeping.
Storage of fuels, oils, chemicals and other hazardous liquids	Storage tanks will be suitable and labelled for the liquid being stored; Bunds to be at least 110 % of the container; and Daily inspections of tanks.

ENVIRONMENTAL ASPECT	BEST PRACTICE REQUIREMENT
Energy efficiency	Plant and equipment to be maintained and serviced regularly; and Turn off plant and equipment when not in use.
Air quality	Maintenance of roads; Turn off plant and equipment when not in use; and Plant and equipment to be maintained and serviced regularly.

3.3 ENVIRONMENTAL MONITORING

A monitoring and evaluation program will be used in line with internal HSE standards to evaluate environmental performance and promote continual improvement. Monitoring also supports environmental management on site to evaluate how effective the environmental management has been, over an extended period of time.

An environmental monitoring schedule will be put in place for the operations and the underground domain.

The monitoring program comprises:

- Air quality monitoring;
- Noise and vibration monitoring;
- Water monitoring (e.g. surface water, groundwater and discharge water) correlated to an acid rock and mine drainage investigations and monitoring;
- Biodiversity monitoring (e.g. fauna, vegetation);
- Meteorological monitoring (e.g. rainfall and evaporation); and
- Stakeholder and community engagement.

The Environmental Officer with the support of the community officer, will be tasked with conducting the monitoring within the underground Domain with the support of the Mining Manager.

4 COMMUNICATION AND TRAINING

To ensure potential risks and impacts are minimised it is vital that personnel are appropriately informed and trained on how to properly implement the ESMP. It is also important that regular communications are maintained with stakeholders (if applicable) and made aware of potential impacts and how to minimise or avoid them. This section sets out the framework for communication and training in relation to the ESMP.

4.1 COMMUNICATIONS

During construction and operations, the project manager and site manager shall communicate site-wide environmental issues to the project team through the following means (as and when required):

- Ensure all personnel are afforded the opportunity to attend an environmental site induction that sets out their requirements in relation to this ESMP
- Ensuring audits and inspections are undertaken regularly on a risk-based schedule
- Toolbox talks, including instruction on incident response procedures
- Deliver project-specific environmental briefings where required
- Ensure all personnel have access to the ESMP
- Ensure operators of key activities and environmentally sensitive operations are briefed and understand their requirements
- Ensure emergency procedures are tested to ensure the programs, procedures, risk assessments, and training is adequate.

This ESMP shall be distributed to the mining team including any contractors and personnel working on the mining site to ensure that the environmental requirements are adequately communicated. Key activities and environmentally sensitive operations shall be briefed to workers and contractors.

During the mining activities, communications between the management team shall include discussing any complaints received and actions to resolve them; any inspections, audits, or non-conformance with this ESMP; and any objectives or target achievements.

4.2 ENVIRONMENTAL EMERGENCY AND RESPONSE

An emergency is any abnormal event, which demands immediate attention. It is any unplanned event, which results in the temporary loss of management control at site, but where functional resources can manage the response. An Emergency Response plan document will be put in place that manages the response in relation to emergencies including environmental emergencies. Emergency contact details are presented in Table 5.

Table 5 – Emergency contact details

TOWN	AMBULANCE	POLICE	FIRE BRIGADE
Rosh Pinah	063 274 911 / Toll Free 924	+264 (63) 274 597	

For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the office of the Ministry of Environment, Forestry and Tourism (MEFT) informed of the incident (telephone +264 61 284 2111). All correspondence with MEFT should be undertaken by the General Manager.

For the clean-up of smaller spills, the relevant Material Safety Data Sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic spill response training will be provided as part of the site environmental induction, spill response equipment, including relevant MSDS copies, will be provided in areas where potentially environmentally hazardous chemicals may be used.

4.3 COMPLAINTS HANDLING AND RECORDING

Any complaints received verbally by any personnel on the project site shall be recorded by the receiver including:

- The name of the complainant
- The contact details of the complainant
- Date and time of the complaint
- The nature of the complaint

The information shall be given to the project manager who is overall responsible for the management of complaints. The project manager shall do the following:

- Inform the site manager of issues, concerns, or complaints.
- The project manager must maintain a complaint register that required details of the complaint
- The project manager will provide a written response to the complainant of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons why are to be recorded in the register

The workforce shall be informed about the complaints register, its location and the person responsible, to refer residents or the general public who wish to lodge a complaint. The complaints register shall be kept for the duration of the Project and will be available for government or public review upon request.

4.4 TRAINING AND AWARENESS

All personnel working on the project shall be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training, and experience. Training and toolbox talks will be provided to all employees and contractors.

4.5 SITE INDUCTION

All personnel involved in the Project shall be inducted to the site with a specific environmental awareness training, and health and safety issues. The environmental awareness training shall ensure that personnel are familiar with the principles of this ESMP, and the environmental impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures. The project manager shall ensure a register of completed training is maintained.

The site induction should include, but is not limited to the following:

- A general site-specific induction that outlines:
 - o What is meant by “environment” and the ESMP?
 - o Why the environment needs to be protected and conserved?
 - o How can mining activities impact the environment?
 - o What can be done to mitigate against impacts?
- The inductee's role and responsibilities concerning implementing the ESMP
- The site's environmental rules
- Details of how to deal with, and who to contact should any environmental problems occur
- Basic vegetation clearing principals and species identification sheets
- Informed of the Chance Find Procedure
- The potential consequences of non-compliance with this ESMP and relevant statutory requirements, and
- The role of responsible people for the Project.

5 INCIDENT REPORTING

The proponent must have an accident and incident reporting system that covers all applicable statutory requirements. The section below sets out the minimum requirements for incident reporting and should be used as a basis for incident reporting, in the event that no incident reporting system exists.

5.1 MINOR INCIDENT OR “NEAR MISS”

Any incident or “near miss” involving the Proponent’s employees, a nominated representative, any contractor, or its subcontractors or any third party’s personnel, property, plant, or equipment, must be

- 1) Orally reported to the manager or the manager’s nominated representative:
 - a. immediately and without delay
 - b. regardless of whether or not injury to personnel has occurred
 - c. or property or equipment has been damaged.
- 2) Written up and handed to the manager or the manager’s nominated representative by the end of the shift. The written report should:
 - a. state all known facts and conditions at the time of the incident and
 - b. includes a preliminary assessment of the most likely potential consequences of the incident under the current circumstances.

5.2 SERIOUS INCIDENT

For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched until witnessed by a representative of the police. This requirement does not preclude immediate first aid being administered and the location being made safe.

5.3 INCIDENT REPORT AND CLOSE OUT

The manager must investigate the cause of all work accidents and significant incidents and must provide the results of the investigation and recommendations on how to prevent a recurrence of such incidents. A formal root-cause investigation process should be followed.

6 COMPLIANCE AND ENFORCEMENT

6.1 ENVIRONMENTAL INSPECTIONS AND COMPLIANCE MONITORING

Inspections and audits of the site will be managed and undertaken by the Mining manager to check that the standards and procedures set out in this ESMP are being complied with and pollution control measures are in place and working correctly. All equipment will be inspected to ensure they are operating as per specification; no damage has been caused, and no leaks or spills have occurred. Any non-conformance shall be recorded, including the following details: a brief description of non-conformance; the reason for the non-conformance; the responsible party; the result (consequence); and the corrective action is taken and any necessary follow up measures required. The application documentation for renewal of the environmental clearance certificate must include an audit report and copies of the 6 bi-annual reports that were submitted every 6 months for the 3 years that the clearance certificate is valid for.

6.2 HERITAGE PERMIT

As part of the application for an environmental clearance, an application for a permit must first be submitted to the National Heritage Council (NHC). Once issued the permit must be cited and included in the ESIA report and ESMP. The contents of the application for the heritage permit can be obtained from the council. The requirements to renew the heritage permit can also be obtained from the council's head offices in Windhoek.

6.3 WATER PERMITS AND LICENCE

The Water Act of (1956) governs the use of water resources in Namibia and is the enforceable piece of legislation for water related matters. The Water Resources Management Act of (2013), passed but pending regulations (not enforced), provides an improved framework for managing water resources based on the principles of integrated water resource management. While not enforced, it is considered best practice to adhere to its stipulations while ensuring compliance with the Water Act of 1956 at the same time.

6.4 WASTEWATER DISCHARGE PERMIT

In the event that the operations produce wastewater, a permit must be obtained from the Department of Water Affairs (DWA). In order to obtain an effluent wastewater permit, the proponent should provide the following information and complete the application form issued by the DWA:

- Specification of the treatment system (type of technology)
- Description of major activities resulting in effluent generation
- List of contaminants (analysis of effluent samples)

- Effluent quality
- Points of discharge
- Show the present average quantities of incoming water, recycled water, final outflow
- Where final effluent will be discharged

6.5 REPORTING

Reports shall be submitted to the Mining Commissioner in terms of the Minerals (Mining and Prospecting) Act, No. 33 of 1992.

Bi-annual environmental reports shall be submitted to the Environmental Commissioner every 6 months of every year. These reports should include records of the monitoring and other deliverables of every aspect or programme described in the ESMP.

6.6 NON-COMPLIANCE

Where it has been identified that works are not compliant with this ESMP, the project manager shall employ corrective actions so that the works return to being compliant as soon as possible. In instances where the requirements of the ESMP are not upheld, a non-conformance and corrective action notice shall be produced. The notice shall be generated during the inspections and the project manager shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcomings.

A non-compliance event / situation is considered if, for example:

- There is evidence of a contravention of this ESMP and associated indicators or objectives.
- The site manager and or contractor have failed to comply with corrective or other instructions issued by the environmental manager or qualified authority.
- The site manager and or contractor fail to respond to complaints from the public.

Activities shall be stopped in the event of a non-compliance until corrective action(s) has been completed.

6.7 DISCIPLINARY ACTION

This ESMP is a legally binding document and non-compliance with it shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- Fines / penalties
- Legal action
- Monetary penalties imposed by the proponent on the contractor
- Withdrawal of licence
- Suspension of work

The disciplinary action shall be determined according to the nature and extent of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

7 BIODIVERSITY MANAGEMENT PROGRAMME

7.1 INTRODUCTION

Construction of the mine and operations on site will include the removal off floral and displacement of fauna. It is therefore vital to ensure that all management, monitoring and mitigation actions are adhered to in order to manage and minimise environmental impacts and any potential pollution that could further impact the receiving environment.

7.2 OBJECTIVES

The ESMP objectives are to minimize negative direct effects of the mining construction and operations on the receiving environment. These objectives are:

- Mitigation and monitoring
- Avoid compromising future exploration of resources by managing impacts and mitigating or minimizing these impacts
- Establish and maintain an information base that will assist in evaluating the cumulative impacts of the operations and establish recovery rates of biodiversity impacted during the mining operations
- Minimize potential conflict with fauna
- Ensure the conservation of biodiversity where possible
- Preserve ecosystem services, such as function related to water, soil, drainage

7.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

Required to take all reasonable measures to prevent the damage of flora and fauna and pollutants from the site into the receiving environment. Report any damage to fauna or flora to the environmental coordinator.

ENVIRONMENTAL COORDINATOR

Will ensure that the objectives listed above are being met and provide performance feedback to the manager

7.4 BIODIVERSITY MANAGEMENT MEASURES

The biodiversity management plan measures are designed to minimise the damage to biodiversity on site. Mining activities that could potentially damage protected and endangered species include:

- Chemical spills and mine water contamination
- Refueling
- Clearing land

Error! Reference source not found. below shows the environmental risks and issues, and mitigation and monitoring measures for biodiversity aspects.

Table 6 - Biodiversity management aspects

Responsibility	– Environmental Manager
Potential issues or impacts	<ul style="list-style-type: none"> – Possible injury or death of animals – Poaching – Habitat fragmentation from clearing and underground mining. – Flora disturbance – Habitat loss from excessive clearing
Mitigation measures	
General	<ul style="list-style-type: none"> – Ensure internal land clearing permits are applied for prior to land clearing and through this process the environmental team have the opportunity to recover or rescue plants of significance or plants that can be used for progressive rehabilitation. Permits obtained from Directorate of Forestry. – Limit the development to actual sites to be mined and avoid affecting adjacent areas, especially mountainous areas and ephemeral drainage lines, throughout the entire area. – Avoid development and associated infrastructure in sensitive areas e.g. hills and drainage lines (ephemeral rivers/streams) in the immediate area. This would minimise the negative effect on the local environment, especially unique features serving as habitat to various vertebrate fauna species. – Minimise areas cleared by ensuring that an early works construction plan or a construction management plan is in place and conveyed to contractors. – Avoid all areas not directly targeted for the various mining infrastructures. – All workers on-site are to be notified to avoid any excluded areas or species. – Identify rare, endemic, endangered, threatened and protected species and demarcate them and avoid cutting them down, trampling them, or removing them, where possible. – Remove (e.g. capture) unique fauna and sensitive fauna, as well as slow moving species before commencing with the development activities, as well as during the operational phase, and or species serendipitously located during this period and relocate to a less sensitive/ disturbed sites in the immediate area. – Remove unique, sensitive flora and protected plant species before commencing with the development activities and relocating to less sensitive/disturbed sites in the immediate area, if disturbance cannot be avoided.

	<ul style="list-style-type: none"> – Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) – Prevent and discourage fires – especially during the development phase(s) – as this could easily cause runaway veld fires affecting both the local fauna and flora (e.g., loss of grazing and domestic stock mortalities, etc.) for the neighbouring farmers. – Prevent domestic pets – e.g. cats and dogs – accompanying the workers during the construction phase as cats decimate the local fauna and interbreed and transmit diseases. Dogs often cause problems when bonding on hunting expeditions thus negatively affecting the local fauna. The indiscriminate and wanton killing of the local fauna by such pets should be avoided at all costs. – Prevent the planting of potentially invasive alien plant species for ornamental purposes as part of the landscaping – e.g., office buildings, plant site, access gate, etc. Alien species often “escape” and become invasive causing further ecological damage as is evident from previous human habitation in the area. – Eradicate – destroy – all invasive alien plants encountered on site. This would ensure that the spread is limited and show environmental commitment. – Incorporate indigenous vegetation – especially the protected species – into the overall landscaping. Indigenous species require less water and overall maintenance. – Initiate a suitable waste removal system as this often attracts wildlife – e.g., baboons etc. – which may result in human-wildlife conflict issues. – Educate/inform contractors and staff on protected species to avoid and the consequences of illegal collection of such species. – No snares or catching of animals, no keeping or housing of pets or livestock for food. – No poaching. – No animals or birds may be collected, caught, consumed, or removed from the site by the contractor or personnel on site. No poaching. – Monitor, manage and prevent mine site water contamination of soils, groundwater and any ephemeral waterways. – Progressive rehabilitation during the mining phase should be used as soon as possible and continue throughout the operating phase. – Rehabilitation of the disturbed areas – i.e., initial development access route “scars” and associated tracks as well as associated mining/prospecting infrastructures should be rehabilitated as soon as their use is complete, otherwise access needs to be restricted. Preferably workers should be transported in/out to the construction sites on a daily
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	<p>basis to avoid excess damage to the local environment (e.g., fires, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment.</p> <ul style="list-style-type: none"> – Natural drainage patterns should be restored where possible. – Investigate the idea of employing an Environmental Officer during the construction phase(s) to ensure compliance and minimise the overall impact on the flora and the environment.
Tracks	<ul style="list-style-type: none"> – Avoid placing access routes (roads and tracks) through sensitive areas – e.g. over hills and along drainage lines within ephemeral (intermittent) streams and rivers. This would minimise the effect on localised potentially sensitive flora and habitats in the area. – Route new tracks around established clumps of vegetation, where possible – Avoid driving randomly through the area (i.e. “track discipline”), but rather stick to permanently placed roads/tracks – especially during the construction phase. This would minimise the effect on localised potentially sensitive flora and habitats in the area – Avoid having to create new tracks for ongoing maintenance and inspections. – Stick to speed limits that are established to result in fewer faunal road mortalities as well as less dust pollution. Speed humps could also be used to ensure the speed limit. – Implement erosion control. – i.e., avoid constructing tracks up steep gradients (where runoff can deeply incise the slope and erode the road); incorporate erosion furrows (runoff sites) and humps along tracks to channel water off the tracks to minimise erosion problems; cross drainage lines at right angles, etc. The area(s) towards and adjacent the drainage line(s) are easily eroded, and further development may exacerbate this problem. Avoid construction within 100 m of the main drainage line(s) (ephemeral streams) to minimise erosion problems as well as preserving the riparian associated flora and fauna.
Access route	<ul style="list-style-type: none"> – Revegetate access routes upon completion of installation of associated infrastructure where possible.
WRD	<ul style="list-style-type: none"> – Terrace the waste rock dumps and cover with soil to facilitate stabilisation and rehabilitation. – Maintain drainage pathways and repair erosion gulleys
Monitoring requirements	
<ul style="list-style-type: none"> – Daily visual inspection during construction of new access tracks/widening, land clearing areas. – Clearing fire breaks on a regular basis, especially prior to the windier months. – Regular checking of rehabilitation areas to ensure that the vegetation is flourishing and not dying. 	

- Biodiversity monitoring should be undertaken annually. This program will include, but is not limited to, monitoring of the condition of habitats, ecosystems, topsoil stockpiles, species inventory and alien vegetation control.
- Vegetation clearing permits are valid and on file.
- Water and groundwater monitoring to prevent water and soil contamination and impacts to related ecosystem services

8 SURFACE AND GROUNDWATER MANAGEMENT PROGRAMME

8.1 INTRODUCTION

Chemical and waste spills must be contained, so as not to contaminate the soil or groundwater. Any contact with groundwater must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer. It is important to limit the potential for wastewater seepage to groundwater.

This surface and groundwater management plan outlines appropriate surface and groundwater water management measures, monitoring programs and reporting procedures to be implemented.

8.2 OBJECTIVES

This surface and groundwater management plan has been prepared to minimise potential impacts on surface and groundwater resulting from the mining activities. It is important to report any contact with or contamination of groundwater to the environmental coordinator or site manager as soon as possible.

8.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

Required to take all reasonable measures to prevent the discharge of sediments and pollutants from the site into surface and groundwater sources. Report any contact with groundwater to the environmental coordinator.

ENVIRONMENTAL COORDINATOR

Will ensure that the objectives listed above are being met and provide performance feedback to the manager.

8.4 SURFACE AND GROUNDWATER MANAGEMENT MEASURES

The surface and groundwater management plan measures are designed to minimise the runoff of sediment-laden or polluted water/effluent into the surrounding environment. Mining activities that could potentially alter natural surface water and groundwater quality include:

- Chemical spills
- Refuelling
- Seepage of wastewater or metal/acid-contaminated mine waters into groundwater
- Dewatering and mining
- Poor resource stewardship practices.

The following requirements are to be met to ensure that groundwater is not contaminated:

- Fuel/oil and chemicals must be safely stored and removed.
- Any contact with surface or groundwater must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer.

Further management and mitigation measures are outlined in Table 7 below.

Table 7 - Water quality mitigation measures

Responsibility	Mining Manager Site Manager Employees
Potential issues or impacts	Groundwater contamination due to incidental hydrocarbon spills Change in the watertable Water contamination due to acid mine drainage (AMD)
Protection of groundwater	Where the water table is penetrated by drilling and the water flows out onto the surface, a furrow needs to be dug that diverts the water to vegetation.
	All boreholes should be capped and labelled. In the instances where water is encountered the water should be sampled and tested and the local farm owner be made aware thereof
	Water saving measures should be applicable at all times. No taps or pipes left to run, leaks to be detected immediately. Vehicles only to be washed with buckets, not running water
Sewage and grey water from temporary portable toilets on site	Use of the toilets instead of the veld must be strictly adhered to
	If grey water can be collected from ablution facilities at the site it should be recycled and: <ul style="list-style-type: none"> ○ Used for dust suppression ○ Used to water vegetable gardens or to support a small nursery in local communities (as and when agreed upon by such communities) ○ Used to clean equipment
Lowering of the groundwater levels	<ol style="list-style-type: none"> 1. To maximise the re-use of water during the construction and operational phases in order to minimise the use of clean water no matter the source. 2. Extraction volumes of water shall be minimal during mining and where possible, water from existing water sources shall be used. 3. Use water effectively and efficiently by following the reduce-recycle-reuse approach. 4. Record volumes of abstraction and supply 5. A site wide water balance will be kept and updated on a regular basis

<p>Inefficient use of water resources</p>	<ol style="list-style-type: none"> 1. To ensure compliance with all legal obligations 2. All plant and surface infrastructure (including the TSF and waste rock dumps) to be designed and constructed according to national standards and applicable legislative requirements, to prevent surface water and groundwater contamination. 3. Ensure erosion control and prevention measures are in place during construction. 4. Ensure any new laydown areas that will be used for construction of the mine are located outside of stormwater catchment areas 5. Installation of diversion structures to divert non-contact surface water away and around the mining operations 6. Refuelling shall be undertaken in a designated area. 7. All stationary vehicles and machinery must have drip trays to collect leakages of lubricants and oil during any field repairs or emergency maintenance. 8. In the event of pollution, polluted soils must be collected and disposed of at an approved site. 9. A 'good housekeeping' policy shall be adopted across the mining area
<p>Blasting could penetrate the groundwater table,</p>	<ol style="list-style-type: none"> 1. Dewatering of the mine may be necessary; if suitable this water can either be used in the processing plant or pumped into drainage lines of the catchment downstream of the infrastructure 2. The impact of mining and any dewatering on the surrounding aquifers will be monitored and reported on. Should there be a reduction of the cone as a direct result of dewatering from the mine then an alternative source of water may need to be identified for the affected users if any.
<p>Any hazardous fluid or lubricating chemicals used could enter the aquifer or surface water environment causing pollution</p>	<ol style="list-style-type: none"> 1. Hazardous waste disposal facilities need to be approved by the MEFT prior to construction and / or meet industry standards to prevent pollution events from occurring 2. Temporary waste disposal facilities will be provided for the collection of waste, which will be removed regularly by a reputable contractor to the permitted waste disposal site. 3. Tailings, chemical and hydrocarbon spillages from trucks, conveyors and pipelines will be cleaned up timeously in order to prevent contamination. 4. Water in the pollution control dams will be used for road watering for dust suppression, make up water where possible, industrial water or for construction. 5. The contractors' laydown areas are to be surfaced and will drain to a sump with silt traps and hydrocarbon collectors. 6. All chemicals, bulk fuels, oils and grease and any other hazardous substance, will be stored and handled as per all applicable legislation and national standards.

	<ol style="list-style-type: none"> 7. Portable chemical toilets will be provided during the construction phase. They will be routinely cleaned, and sewage disposed of at a licenced sewage treatment plant with the safe disposal certificate to be provided. 8. A sewage plant may be provided for during the operational phase and the treated water will either need to be contained in pollution control dams and will be recycled or if treated water is of high enough standard, it can be flushed into the catchment’s water courses 9. Pollution control dams will be constructed downslope of the mine and plant site to capture all dirty water run-off 10. Silt traps will be constructed upslope of the pollution control dams and return water dam. 11. The pollution control facilities (pollution control dams, silt traps and return water dam) will be placed on planned maintenance, routine inspections will be implemented, and they will be de-silted periodically to ensure effective performance
<p>Monitoring requirements</p>	<ol style="list-style-type: none"> 1. Take borehole water level at the start of mining and at the end of mining operations. 2. Keep the records. 3. Monitor the use of water and keep records of daily requirements.

8.5 SURFACE AND GROUNDWATER QUALITY MONITORING

Every effort must be made throughout to preserve the quality of surface water and groundwater sources that the proponent may impact. Containment of waste and chemicals and the correct disposal thereof must be of an acceptable standard. Personnel must report any unusual conditions and intersection with surface and groundwater immediately to the environmental coordinator.

The Department of Water Affairs require quarterly reporting for water quality of water from the sources for which a permit was required, namely, for abstraction permits and discharge permits.

1. Daily and weekly observations for any leakages
2. Maintain a record of all abstracted volumes and report to DWA / MAWLR as per permit conditions
3. Install water flow meters if required
4. Maintain a monthly water balance
5. Submit quarterly water quality tests for water and monitoring boreholes, effluent discharge points and any surface water bodies.
6. Monitor the integrity of the weir / dam wall in accord with the frequency laid down by engineers who designed the structures.

9 WASTE MANAGEMENT PROGRAMME

9.1 INTRODUCTION

The construction and mining activities will generate both solid and liquid waste. The types of waste generated at the facility are classified as mineral and non-mineral waste. All non-mineral waste will eventually be removed from the mine site and will either be disposed of at the Rosh Pinah landfill site (household or garden waste) or the Windhoek - Kupferberg/Walvis Bay hazardous waste disposal site. Mineral waste from mining operations is either deposited on the WRD or TSF or a combination of both.

9.2 OBJECTIVES

This waste management programme has been prepared to ensure the proper storage, transport, treatment, and disposal of waste and where possible will follow the waste hierarchy, which encourages waste avoidance and waste reduction followed by reuse, recycling, and reclamation, before waste treatment and waste disposal.

9.3 ROLES AND RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

- Required to ensure that all waste generated during mining activities is removed and disposed of accordingly including providing evidence in the form of waste transfer receipts for the waste moved off site.
- Ensure no windblown rubbish pollutes the environment, and
- Remove waste on a regular basis to prevent vermin.

SITE MANAGER AND ENVIRONMENTAL COORDINATOR

- Required to inspect receipts and evidence of correct waste handling.
- Review waste management practices regularly during the construction and mining operations on site.

9.4 SOLID AND LIQUID NON-MINERAL WASTE

The mine site will set up a form of recycling system thus reducing its impacts associated with solid waste generation. Where possible the proponent will implement measures to reduce, reuse and recycle waste generated as part of the operations of the mine. In order to achieve this a temporary waste storage facility will be required.

Waste will be controlled through prevention and mitigation measures as follows:

- Reduce, reuse, and recycle where possible
- Storage of domestic waste on site may result in the attraction of unwanted scavengers and should be disposed of the accredited site as soon as is feasible, and
- Hydrocarbon and chemical contaminated solids have the potential to cause contamination to the soil, groundwater and/or surface water, thus correct storage and

disposal methods are required. Some of these materials can be recycled or used by other facilities.

Further management and mitigation measures are outlined in Table 8 below.

Table 8 - Waste mitigation measures

Responsibility	Mining Manager Site Manager Employees
Potential issues or impacts	Soil, surface water and ground water contamination due to spillage Land and water pollution. Loss of biodiversity Infectious diseases
Waste Management Plan	The Proponent should compile a Waste Management Plan that should address as a minimum the mitigation measures included below
Hazardous waste	All mining vehicles (4x4 vehicles and trucks) and equipment on site should be provided with a drip tray/oil spill kit: <ul style="list-style-type: none"> - Drip trays and sealable containers are to be transported with vehicles wherever they go - Drip trays should be cleaned daily, and spillage handled, stored, and disposed of as hazardous waste
	All mining vehicles should be maintained regularly to prevent oil leakages. Maintenance of vehicles is not permitted to occur on site as far as reasonably possible, but if maintenance is to be undertaken on site, measures need to be put in place to avoid hydrocarbon spillages.
	Maintenance and washing of mining vehicles should be conducted at a suitable site/facility which adhere to the following: <ul style="list-style-type: none"> - The work area/facility should be lined to be impermeable - The work area/facility should have an oil-water separator (oil trap) to collect any run-off from the washing and or maintenance activities, or be equipped with an oil and water separation system
	Spilled oil or fuel should be treated as hazardous waste, disposed of as it occurs in the appropriate hazardous waste containers (sealable drums) on site, and removed off site at the end of each day to the closest recognised, appropriate hazardous waste disposal site in the vicinity or as soon as possible when working in remote areas. All such waste should be provided to specialists in the handing and treatment of such materials

	All hazardous substances (e.g., fuel, grease, oil, drilling fluids etc.) or chemicals should be stored in a specific location at the mining campsite on an impermeable surface which is bunded
General waste	<p>The mining site should be always kept tidy. All domestic and general waste produced daily should be contained:</p> <ul style="list-style-type: none"> - No waste may be buried or burned - No waste is to be left uncontained, in suitable containers, over night - Waste containers (bins) should be emptied regularly and removed from site to the nearest official waste disposal site. All recyclable waste needs to be taken to the nearest recycling depot if available - A sufficient number of separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such - Mining personnel 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
Residual mineral samples	Samples that will not be used for further analysis, or submitted to MME should be taken off site or used (with the required permission from the affected landowner and/or tenant) to repair any possible damaged roads. No samples are to be dumped at site or in the vicinity of the site as to not affect rehabilitation efficiency through physical and chemical pollution of weathering samples.
Littering and environmental contamination from waste	No littering by workers shall be allowed.
	All litter on and around the site must be picked up and placed in the bins provided.
	The site should be kept tidy and free of litter at all times. All domestic and general waste produced on a daily basis should be cleaned and contained daily.
	No solid waste landfill will be established at the site.
	No waste shall be burned or buried anywhere unless permitted to do so.
	Waste shall be collected and shall be removed regularly to avoid bad odours.
	Hazardous and non-hazardous waste shall be stored separately at all times.
Environmental contamination from liquid waste	Hydrocarbon and chemical contaminated solids must be stored correctly and disposed of by registered companies.
	Safe disposal certificates must be kept and provided to the project manager on request.
Sewage and grey water from temporary	<p>Portable toilets such as portable camping units, must be provided during mining:</p> <ul style="list-style-type: none"> - At all drill sites

portable toilets on site	Discharging of the portable units are to be conducted at an existing suitable facility
	The Solid Waste division of the town council should be contacted should permission be sought to dump at the landfill site
Monitoring Requirements	<ul style="list-style-type: none"> – Monitor whether the provisions set out in this ESMP concerning waste management is being applied as per instructions – All non-compliances should be recorded and discussed at weekly site meetings and timeous remedial actions taken – All guilty parties that are in contravention of the provisions set out for managing waste should be given a penalty and according to the severity of the impact appropriate steps taken

9.5 WASTE DISPOSAL MONITORING

Certificates providing the safe disposal of waste from a permitted hazardous waste disposal site must be provided to the manager upon request.

10 SPILL MANAGEMENT PROGRAMME

10.1 INTRODUCTION

The uncontrolled release of fuels and other chemicals has the potential to result in the contamination of soil, groundwater, and surface water, which may lead to serious environmental harm. On this basis, the storage and use of fuels or other chemicals must be managed to minimise the risk of a release, and measures must be in place to promptly address impacts should a release occur.

10.2 OBJECTIVES

This spill management plan has been prepared to minimise the potential for the uncontrolled release of fuels, oils and other chemicals. Preventative measures to minimise the potential for a spill are listed. Should a spill occur, this plan provides guidance for the proponent on the appropriate spill response measures.

10.3 ROLES AND RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

Required to implement the spill prevention and response measures listed below.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR

Required to ensure that appropriate spill prevention measures (listed below) are implemented and that any spills have been appropriately managed and reported.

10.4 SPILL PREVENTION MEASURES

The following management measures are to be implemented by the proponent:

- Spill kits are to be made available throughout the site. The kits are to include, as a minimum, the following items:
 - o Absorbent materials
 - o Shovels
 - o Heavy-duty plastic bags
 - o Protective clothing (e.g., gloves and overalls), and
- Major servicing of equipment shall be undertaken off site or in appropriately equipped workshops
- Provision of adequate and frequent training on spill management, spill response and refuelling must be provided to all onsite staff and contractors
- Fuels, lubricants, and chemicals are to be stored within appropriately sized, impermeable bunds or trays with a capacity not less than 110% of the total volume of products stored

- All fuel and chemical storage and handling equipment (including transfer hoses, etc.) shall be well maintained
- Storage and handling of fuels and chemicals shall be in compliance with relevant legislation and regulations
- No refuelling is to take place within 50 metres of groundwater boreholes, surface water or streams, and
- MSDS are to be kept for each chemical used on site. These must be easily accessible to all personnel.

10.5 SPILL RESPONSE MEASURES

The primary concern, in the event of any spill, is the health and safety of any residents/ employees and contractors in the vicinity. Of secondary, but highly significant, importance, is the protection of water sources and then soil and vegetation.

The following points therefore apply to all areas on the site:

- Assess the situation for potential hazards.
- Do not come into contact with the spilled substance until it has been characterised and necessary personal protective equipment (PPE) is provided.
- Isolate the area as required.
- Notify the site manager or safety, health, and environmental coordinator.

The following measures are to be implemented in response to a spill:

- Spills are to be stopped at source as soon as possible (e.g., close valve or upright drum)
- Spilt material is to be contained to the smallest area possible using a combination of absorbent material, earthen bunds, or other containment methods
- Spilt material is to be recovered as soon as possible using appropriate equipment. In most cases, it will be necessary to excavate the underlying soils until clean soils are encountered
- All contaminated materials recovered subsequent to a spill, including soils, absorbent pads, and sawdust, are to be disposed to appropriately licenced facilities
- The manager or safety, health and environmental coordinator are to be informed as soon as possible in the event of a spill, and
- A written Incident Report must be submitted to the manager.

Further management and mitigation measures are outlined in Table 9 below.

Table 9 - Spill mitigation measures

Responsibility	<ul style="list-style-type: none"> - Mining Manager - Site Manager - Employees
Potential issues or impacts	Soil, surface water and ground water contamination due to spillage
Stored Hazardous Chemicals	Hazardous chemicals are to be stored in bunded areas
	Hazardous chemicals (such as fuels) are to be handled over areas provided with impervious surfaces
	Spills of hazardous chemicals are to be contained and cleaned-up to ensure protection of the environment
	All the necessary PPE required for the safe handling and use of petrochemicals and oils shall be provided to, and used or worn by, the onsite staff
Machinery and Equipment Maintenance	Major servicing of equipment shall be undertaken off site or in appropriately equipped workshops
	For small repairs and required maintenance activities all reasonable precautions to avoid oil and fuel spills must be taken (e.g., spill trays, impervious sheets).
	Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks
	All the necessary PPE required for maintenance activities must be issued to staff whose duty it is to manage and maintain the machinery and equipment.

The table below (

Table 10) shows the environmental risks and issues, and mitigation and monitoring measures for the Spill of hazardous substances.

Table 10 - Spill of hazardous substances

Responsibility	<ul style="list-style-type: none"> - Mining Manager - Site Manager 	
Potential issues or impacts	Hydrocarbon and chemical handling and storage can cause spillages that lead to groundwater contamination and soil contamination.	
Management/ Mitigation measures	Safe delivery and handling	<ol style="list-style-type: none"> 1. Training employees and toolbox talks 2. Good housekeeping across the site 3. Fuel and chemicals are handled with care 4. Spill kits to be at designated areas across the site or available for use during refuelling,

		<p>fuel/chemical delivery, or use. Absorption material should be available and at hand. Where sawdust is used it should be cleaned up immediately and not left for long periods as this poses a fire hazard</p> <p>5. Any major spill is reported once containment has been achieved</p> <p>6. Plant and equipment to be well maintained and serviced regularly</p> <p>7. In the field, the use of hydrocarbons under 200 litres can be used for mobile refuelling or servicing</p>
	Storage	<p>1. All tanks to be stored on a non-porous floor and within a bunded area.</p> <p>2. Bund to be capable of storing at least 110% of the volume of the largest tank</p> <p>3. All containers to be suitable for use and not damaged</p> <p>4. Tanks are locked at all time</p> <p>5. Spill kits available at storage locations and around the site at suitable locations</p>
	Refuelling	<p>1. Drip tray to be used during refuelling of vehicles and on an impermeable flat surface where possible</p> <p>2. A funnel should be available and used to avoid spillage during decanting</p>
	Rehabilitation	<p>Contaminated soils should be removed and deposited on lined storage areas for rehabilitation purposes. Rehabilitation can take place naturally by adding water, air and fertiliser. The process can be accelerated by using special additives that will breakdown the hydrocarbons. Once rehabilitated the soils can be used for revegetating WRD slopes.</p>
Monitoring requirements	<ul style="list-style-type: none"> – Daily observations when fuels/chemicals are delivered and handled – Supervision during refueling – Weekly observations monitor containment and storage – Establish an internal land clearing permit system that restricts advance clearing. – Monitor the level of hydrocarbons in contaminated soils after a year of rehabilitation. 	

- | | |
|--|--|
| | – Monitor each year until the soils are ready for re-use in revegetation projects. |
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For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the office of the Ministry of Environment, Forestry and Tourism (MEFT) informed of the incident (telephone +264 61 284 2111). All correspondence with MEFT should be undertaken by the General manager.

For the clean-up of smaller spills, the relevant material safety data sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic spill response training will be provided as part of the site environmental induction, spill response equipment, including relevant MSDS copies, will be provided in areas where potentially environmentally hazardous chemicals may be used.

10.6 SPILL REPORTING

All major petroleum product spills should be reported to the Ministry of Mines and Energy (MME) on Form PP/11 titled “Reporting of major petroleum product spill”, issued by the ministry.

10.7 REHABILITATION OF CONTAMINATED SOILS

All soils that are contaminated with chemicals and or hydrocarbons should be taken to the rehabilitation area. A procedural manual for rehabilitating contaminated soils on site should be developed.

11 AIR QUALITY MANAGEMENT PROGRAMME

11.1 INTRODUCTION

This air quality management plan describes the strategies and procedures that will be implemented to ensure that the health and amenity of construction workers and nearby sensitive receptors are protected from elevated concentrations of airborne dust and other gaseous emissions (e.g., oxides of nitrogen; nitrogen dioxide, particulate matter; sulphur dioxide and carbon monoxide). Typically, the gases present in a mining environment include carbon monoxide, hydrogen sulphide, sulphur dioxide, methane, nitrogen dioxide and ammonia. In cases where generators and other machinery are used, there will be some release of exhaust fumes that will impact the immediate vicinity but will be of short duration.

11.2 OBJECTIVES

This air quality management plan has been prepared to prevent deterioration of air quality and to minimise the potential for emitted dust and airborne pollutants. Preventative measures are listed below.

11.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

To implement the necessary management practices in order to meet the objectives listed above.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR

To ensure that the objectives listed above are being met and to provide performance feedback to the mining manager.

11.4 AIR QUALITY MANAGEMENT PROCEDURES

Activities that may potentially emit dust and airborne pollutants during the operations include the following:

- Vehicle movements
- Machinery operations

Underground mine activities can contribute to ambient noise and vibration, affecting neighbours.

The proponent will minimise the potential for dust generation and the emission of airborne pollutants by undertaking the following management measures, as required:

- Vehicle movements will be restricted to sealed roads.
- Appropriate speed limits will be set and enforced.
- Ground disturbance will be minimised as far as practical.

- Vehicles and machinery will be maintained so as to limit exhaust fume emissions.

Further management and mitigation measures are outlined in Table 11 below.

Table 11 - Air quality mitigation measures

Responsibility	- Mining Manager - Site Manager
Potential issues or impacts	Impaired visibility for drivers and employees Respiratory related health issues
Dust and fumes	Appropriately rated and fitted dust masks should be given to personnel working in areas of dust exposure
	Grey water should be used for dust suppression on a constant basis if available and as required
	Maintain speed limits

11.5 AIR QUALITY MONITORING

Visual monitoring of mining activities can ensure the minimum discharge of airborne dust and other emissions according to the air quality management programme.

1. Daily observations
2. Air Quality Monitoring:

A depositional dustfall monitoring network, comprising of eight (8) single dust fall units, should be maintained and the monthly dust fall results used as indicators to track the effectiveness of the applied mitigation measures. Dust all collection should follow the ASTM method.

11.6 ODOURS, NOISE AND VIBRATION IMPACTS

The sensitive receptors within proximity to the site might be the surrounding farmers. Activities related to the mining activities have the potential to generate nuisance odours, noise and vibration that can impact the quality of life for neighbouring residents and tourism activities. However, this potential impact is minimal due to the nature of the mining methods employed.

Notwithstanding the above point, the proponent should continue to ensure potential odours, noise and vibration sources are mitigated through measures such as:

- Avoid noise generating activities at night, by ensuring noisy activities are avoided especially at night,
- Ensure appropriate measures are put in place to rectify odours, noise and vibration complaints, should they occur.
- Scheduling of works to avoid disturbance between the hours of 7 pm and 5 am, and

- Procedures for receiving complaints from nearby land users or residents to be in place and mitigation measures to be implemented should construction and mining generate excessive odours, noise, and vibration, which is unexpected.

Occupational noise and vibration are managed through the health and safety management plan and therefore not applicable to this ESMP.

Table 12 below shows the environmental risks and issues, and mitigation and monitoring measures for noise aspects.

Table 12 – Noise aspects

Responsibility	- Mining Manager - Site Manager
Potential issues or impacts	Environmental noise evaluation criteria for residential, educational, and institutional receptors are potentially exceeded at NSR 1 and NSR 4 due to proposed Gergarub Project operations.
Management/ Mitigation measures	<ul style="list-style-type: none"> - All diesel-powered equipment and plant vehicles should be kept at a high level of maintenance. This should particularly include the regular inspection and, if necessary, replacement of intake and exhaust silencers. Any change in the noise emission characteristics of equipment should serve as trigger for withdrawing it for maintenance. - In managing noise specifically related to vehicle traffic, efforts should be directed at: <ul style="list-style-type: none"> - Minimising individual vehicle engine, transmission, and body noise/vibration. This is achieved through the implementation of an equipment maintenance program to maintain road surfaces regularly to repair potholes etc. - Keep all roads well maintained and avoid steep inclines or declines to reduce acceleration/brake noise. - Avoid unnecessary equipment idling. - Minimising the need for trucks/equipment to reverse. This will reduce the frequency at which disturbing but necessary reverse warnings will occur. Alternatives to the traditional reverse ‘beeper’ alarm such as a ‘self-adjusting’ or ‘smart’ alarm could be considered. These alarms include a mechanism to detect the local noise level and automatically adjust the output of the alarm is so that it is 5 to 10 dB above the noise level near the moving equipment. The promotional material for some smart alarms does state that the ability to adjust the level of the alarm is of advantage to those sites ‘with low ambient noise level’ Invalid source specified. When reversing, vehicles should travel in a direction away from NSR’s if possible.

	<ul style="list-style-type: none">– Where possible, other non-routine noisy activities such as construction, decommissioning, start-up, and maintenance, should be limited to day-time hours.– A noise complaints register must be kept.– Provision of general notices to the community in the form of notice boards indicating blast times and dates.– As the site or activity is near NSRs, equipment and methods to be employed should be reviewed to ensure the quietest available technology is used. Equipment with lower sound power levels must be selected in such instances and vendors/contractors should be required to guarantee optimised equipment design noise levels.– As far as is practically possible, sources of significant noise should be enclosed. The extent of enclosure will depend on the nature of the machine and their ventilation requirements. Pumps are examples of such equipment.– It should be noted that the effectiveness of partial enclosures and screens can be reduced if used incorrectly, e.g. noise should be directed into a partial enclosure and not out of it, there should not be any reflecting surfaces such as parked vehicles opposite the open end of a noise enclosure.– Equipment should be sited as far away from NSRs as possible. Also:<ul style="list-style-type: none">○ Machines used intermittently should be shut down between work periods or throttled down to a minimum and not left running unnecessarily. This will reduce noise and conserve energy.○ Plants or equipment from which noise generated is known to be particularly directional, should be orientated so that the noise is directed away from NSRs.○ Acoustic covers of engines should be kept closed when in use or idling.○ Doors to pump houses should always be kept closed.○ Construction materials such as beams should be lowered and not dropped.○ Regular and effective maintenance of equipment and plants are essential to noise control. Increases in equipment noise are often indicative of eminent mechanical failure. Also, sound reducing equipment/materials can lose effectiveness before failure and can be identified by visual inspection.○ Noise generated by vibrating machinery and equipment with vibrating parts can be reduced using vibration isolation
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	<p>mountings or proper balancing. Noise generated by friction in conveyor rollers, trolley etc. can be reduced by sufficient lubrication.</p>
<p>Monitoring requirements</p>	<ul style="list-style-type: none"> – Sources of excessive noise will be investigated, and recommendations made for mitigation. – Keep complaints register. – Noise monitoring at sites where noise is an issue or may become an issue is essential. Annual noise sampling over a period of 10 to 30 minutes for day- and night-time at NSRs surrounding the Gergarub site should be incorporated in an annual environmental noise monitoring programme. – If noise related complaints are received short term ambient noise measurements should be conducted as part of investigating the complaints. The results of the measurements should be used to inform any follow up interventions. The investigation of complaints should include an investigation into equipment or machinery that likely result or resulted in noise levels annoying to the community. This could be achieved with source noise measurements.

Notwithstanding the above point, the proponent should continue to ensure potential odours, noise and vibration sources are mitigated through measures such as:

- Avoid noise generating activities at night, by ensuring noisy activities are avoided especially at night,
- Ensure appropriate measures are put in place to rectify odours, noise and vibration complaints, should they occur.
- Scheduling of works to avoid disturbance between the hours of 7 pm and 5 am, and
- Procedures for receiving complaints from nearby land users or residents to be in place and mitigation measures to be implemented should construction and mining generate excessive odours, noise and vibration, which is unexpected.

Occupational noise and vibration are managed through the health and safety management plan and therefore not applicable to this ESMP.

12 SOIL MANAGEMENT PROGRAMME

12.1 INTRODUCTION

The soil quality management plan describes the measures that will be implemented to ensure the protection of the soil on site throughout construction and operational phases of the project. A comprehensive soil quality management plan/programme ensures that the topsoil on the project site is conserved for e-use during decommissioning, mine closure and rehabilitation.

12.2 OBJECTIVES

This soil management plan has been prepared to guide the conservation of the topsoil at the Gergarub site and prevent the deterioration therefore to ensure that it is of the correct quality for mine closure and rehabilitation.

12.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

To implement the necessary management practices in order to meet the objectives listed above.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR

To ensure that the objectives listed above are being met and to provide performance feedback to the mining manager.

Error! Reference source not found. below shows the environmental risks and issues, and mitigation and monitoring measures for soil aspects.

Table 13 - Soil mitigation measures

Responsibility	<ul style="list-style-type: none"> – Mining Manager – Site Manager
Potential issues or impacts	<ul style="list-style-type: none"> – Underground mining can cause changes to soil and landscape. – The land clearing activities by mechanical methods would result in erosion issues.
Mitigations measures	
Changes to soil and landscape	<ul style="list-style-type: none"> – Topsoil should be separately stockpiled to be re-spread when backfilling. – Soils to be stored for longer than three years should preferably not be stockpiled in piles greater than 1.5 m in height. – Slopes of the stockpiles should be constructed to minimise the chances of erosion of the soils.

	<ul style="list-style-type: none"> – Topsoil stockpiles should be vegetated as soon as possible to prevent loss of the resource by wind and water erosion and to retain its micro-biological functions. – Monitor vegetation on soil stockpiles to prevent erosion and loss of topsoil. – Fertilize and vegetate soil stockpiles where required. – Equipment must be in good condition to ensure that lubricant/fuel spills do not contaminate the site. – Ensure soils are replaced in layers in which they were removed. – Disturbed or excavated areas should be backfilled with the soil material that was removed from it, shaped to free draining slopes and planted with sustainable grass/shrub/tree species. – Ensure topsoil stockpiles are not positioned down gradient of potential contamination zones
<p>Land clearing</p>	<ul style="list-style-type: none"> – Avoid clear felling of vegetation in areas viewed as erosion prone – i.e. ephemeral rivers; steep slopes (hill areas). – Reroute or limit the size of or avoid access route(s) in areas viewed as erosion prone – i.e. ephemeral rivers; steep slopes (hill areas). – Where new tracks have to be made off the main routes, the routes should be selected causing minimal damage to the environment – e.g. use the same tracks; cross drainage lines at right angles; avoid placing tracks within drainage lines; avoid collateral damage (i.e. select routes that do not require the unnecessary removal of trees/shrubs, especially protected species). – Rehabilitate all new tracks created as far as practically possible. – Construct permanent non-gravel or tar roads along vehicle route(s) most often used. – Rehabilitate eroded areas annually – i.e. after the rainy season (during winter months). – Implement and maintain erosion control measures where applicable – e.g. cross drains on slopes, etc.

13 TRAFFIC MANAGEMENT PROGRAMME

13.1 INTRODUCTION

There will be an influx of vehicles from light to heavy vehicles and abnormal vehicles on the C13 during construction and operation of the Gergarub mine. The traffic management plan therefore describes the strategies that will be used by the proponent to manage traffic and ensure the maintenance of the road.

13.2 OBJECTIVES

This traffic management plan has been developed to prevent road accidents, manage traffic and ensure the maintenance of the C13 which passes through the Mining Licence. Preventative measures are listed below.

13.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

To implement the necessary management practices in order to meet the objectives listed above.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR

To ensure that the objectives listed above are being met and to provide performance feedback to the mining manager.

Error! Reference source not found. below shows the environmental risks and issues, and mitigation and monitoring measures for traffic aspects.

Table 14 - Traffic mitigation measures

Responsibility	– Site Manager
Potential issues or impacts	<ul style="list-style-type: none"> – Increased traffic volumes on existing roads – Wear and tear of existing road surfaces – Community safety
Mitigations measures	
Increased Traffic on road and vehicular accidents	<ul style="list-style-type: none"> – Designs of the intersection layouts of the mine access road must address design standards and elements such as alignment, sign distances, cross-sections and provisions for other road users including pedestrians, and must be legally compliant. – Inspect mine vehicles and contractors' vehicles weekly for clean and operational taillights, indicators, reflective signage and reverse horns/beepers to ensure visibility of vehicles, especially at night. – The needs of pedestrians should be taken into consideration in the planning and design of the access to the proposed site, as well as the design of the road infrastructure.

	<ul style="list-style-type: none"> – All employees and contractors must adhere to the speed limits and other road safety procedures, both on the mine site, and on public roads. Include speed limits in the induction and enforce the speed limits. – Provide large visible road signage, indicating the presence of heavy vehicle traffic at least 500 m before, on either side of the mine site access road intersection along the road. – Road safety issues must be included as part of the overall on-site safety training and at induction
Monitoring requirements	
<ul style="list-style-type: none"> – Daily observations – Weekly checks 	

14 ARCHAEOLOGICAL AND HERITAGE PROGRAMME

Areas of proposed Project is subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found in the course of development work. The procedure set out here covers the reporting and management of such finds.

Scope: The “chance finds” procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The “chance finds” procedure is intended to ensure compliance with relevant provisions of the National Heritage Act, No. 27 of 2004), especially Section 55 (4): “a person who discovers any archaeological object must as soon as practicable report the discovery to the Council”. The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Table 15 below shows the environmental risks and issues, and mitigation and monitoring measures for Archaeological and heritage aspects.

Table 15 – Archaeological and heritage aspects

Responsibility	<ul style="list-style-type: none"> – Mining Manager – Site Manager
Potential issues or impacts	Impact on heritage features
Management/ Mitigation measures	<p>Should a heritage site or archaeological site be uncovered or discovered during either mining phases of the project, a “chance find” procedure should be applied in the order they appear below:</p> <ul style="list-style-type: none"> – If operating machinery or equipment, stop work – Demarcate the site with danger tape – Determine GPS position if possible – Report findings to foreman – Report findings, site location and actions taken to superintendent – Cease any works in immediate vicinity – Visit the site and consult with any potentially affected community to determine whether work can proceed without damage to findings – Determine and demarcate the exclusion boundary – Site location and details to be added to the project’s Geographic Information System (GIS) for field confirmation by an archaeologist – Inspect site and confirm addition to project GIS – Advise the National Heritage Council (NHC) and request written permission to remove findings from work area

	<p>– Recover, package and label findings for transfer to the National Museum</p> <p>Should human remains be found, the following actions will be required: 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 Remains will be recovered and removed to either the National Museum or the National Forensic Laboratory. Contact person at NHC: Rev. Solomon April; Tel: (061) 244 375/ 385/594</p>
SPECIFIC MITIGATION DETAILS	
Archaeology	Obtain inputs from an archaeologist to identify potential archaeological sites in the area and to determine further mitigation where necessary
Monitoring requirements	<ol style="list-style-type: none"> 1. Check that the archaeologist has given a written statement about the location of the known archaeological sites in the area vs the location of the drilling area. 2. Make sure no archaeological site is disturbed whilst excavation and recovery take place 3. Make sure everything of importance, as identified by an appropriate specialist, is removed from site and declared safe by an archaeologist before mining can continue on the site

14.1 RESPONSIBILITY

Operator - to exercise due caution if archaeological remains are found

Foreman - To secure site and advise management timeously

Superintendent - To determine safe working boundary and request inspection

Archaeologist - To inspect, identify, advise management, and recover remains

14.2 PROCEDURE

Action by person identifying archaeological or heritage material

- a) If operating machinery or equipment stop work
- b) Identify the site with flag tape
- c) Determine GPS position if possible
- d) Report findings to foreman

Action by foreman

- a) Report findings, site location and actions taken to superintendent
- b) Cease any works in immediate vicinity

Action by superintendent

- a) Visit site and determine whether work can proceed without damage to findings
- b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by archaeologist

Action by archaeologist

- a) Inspect site and confirm addition to project GIS
- b) Advise NHC and request written permission to remove findings from work area
- c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

- a) Actions as above
- b) Field inspection by archaeologist to confirm that remains are human
- c) Advise and liaise with NHC and Police
- d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

15 IMPLEMENTATION OF THE ESMP

This environmental management plan:

- A. Has been prepared according to a contract with the Proponent
- B. Has been prepared based on information provided to ECC up to July 2023
- C. Is for the sole use of the proponent, for the sole purpose of an ESMP
- D. Must not be used (1) by any person other than the proponent or (2) for a purpose other than an ESMP
- E. Must not be copied without the prior written permission of ECC.



Submitted to: Gergarub Exploration and Mining (Pty) Ltd
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I&AP PUBLIC CONSULTATION DOCUMENT: I&AP COMMENTS AND RESPONSES FOR THE GERGARUB MINE PROJECT ON ML 245 ESIA REPORT

PROJECT NUMBER: ECC-99-425-REP-09-D

REPORT VERSION: REV 01

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TITLE AND APPROVAL PAGE

Project Name:	I&AP Comments and Responses for the Gergarub Mine Project on ML 245 ESIA report
Client Company Name:	Gergarub Exploration and Mining (Pty) Ltd
Client Representatives:	Mr Sheron Kaviua
Ministry Reference:	APP-00785
Authors:	Monique Jarrett, Gwendal Madec and Jessica Bezuidenhout
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Date of issue:	19 July 2023
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ENVIRONMENTAL COMPLIANCE CONSULTANCY CONTACT DETAILS:

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DISCLAIMER

Environmental Compliance Consultancy Pty Ltd (ECC) (Reg. No. CRN 2022/0593) prepared this report on behalf of the Proponent. ECC employees who authored this report have no material interest in the report's outcome or the Project, and ECC is independent from the Proponent. ECC's professional fees are based on agreed commercial rates and are not contingent on the report's results or the record of decision issued by the Government. No ECC member or employee has a shareholding in the Project or is a director, officer, or direct employee of the Proponent. Personal views expressed by the writer do not necessarily reflect ECC's or the client's views.

The information presented in this environmental report is based on the best available data and our professional judgment at the time of writing. However, it is important to note that environmental conditions can change rapidly, and we cannot guarantee the accuracy, completeness, or currency of the information provided.

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TERMS AND ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
ECC	Environmental clearance certificate
ECC	Environmental Compliance Consultancy
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ESIA	Environmental Impact and Social Assessment
I & APs	Interested and Affected Parties
ML	Mining Licence
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
RoD	Record of Decision
TB	tuberculosis
ToR	Terms of Reference

1 SUMMARY OF PUBLIC MEETING AND COMMENTS FROM I&APS

1.1 INTRODUCTION

Gergarub Exploration and Mining (Pty) Ltd, the Proponent of the Gergarub Mining Project on Mining Licence (ML) 245 in the //Kharas Region of Namibia, has engaged Environmental Compliance Consultancy (ECC) to conduct an Environmental and Social Impact Assessment (ESIA) in compliance with the Environmental Management Act, No. 7 of 2007 and its 2012 regulations. ECC will subsequently apply for an environmental clearance certificate on behalf of the Proponent.

The Gergarub Project aims to extract economically feasible zinc deposits located on ML 245. The mining operation will involve the construction of an underground shaft, ore processing plant, , and waste rock dumps. To engage with the public and relevant stakeholders during the early stages of the Environmental and Social Impact Assessment (ESIA), public meetings were held in Windhoek and Rosh Pinah on the 28th of February and the 2nd of March 2023, respectively. However, there were no attendees at the Windhoek public meeting.

In preparation for the public meetings, invitations were sent out to interested and affected parties, the community, local, regional, and national authorities. Notices were published in local newspapers and media outlets to advertise the meetings. At the meetings, attendees were registered as interested and affected parties (I&APs), and their feedback recorded. A summary of public feedback will be issued to stakeholders, including registered I&APs and the competent authorities such as the Ministry of Mines and Energy (MME) and the Ministry of Environment, Forestry and Tourism (MEFT). This information will accompany the application for an environmental clearance certificate, which will ultimately lead to a record of decision (RoD).

1.2 PUBLIC MEETING SUMMARY

The public meetings were led by Monique Jarrett, an Environmental Assessment Practitioner from Environmental Compliance Consultancy (ECC). Technical support was provided by Sheron Kaviua, the Director of the Gergarub Project.

At the start of the public meetings, the attendees were welcomed and introduced to Environmental Compliance Consultancy (ECC) as an independent environmental consulting company commissioned by the Proponent, Gergarub to act as the Environmental Assessment Practitioner (EAP). ECC was tasked with conducting the environmental impact assessment and applying for an environmental clearance certificate for the proposed Gergarub Project on Mining License ML 245

As part of the Project's introduction to the public, the Project's location, baseline and ESIA process, and procedures were presented. The objective of the current public scoping meeting to engage all stakeholders and to identify further potential studies and assessments that may be required for inclusion in the environmental impact assessment of the Project was also emphasized.

The technical presentation by the client then provided an overview of the proposed operations on ML245 for which the environmental clearance certificate is required, as well as the overall project including:

- Overview of the project
- Project location
- Mining license
- Site layout
- Geology and drilling
- Resources
- Alternatives and innovation
- Mining method
- Ore processing methodology
- Employment and personnel
- Corporate and social responsibility plan

The presentation from ECC covered a detailed description of the public consultation purpose and intentions as part of the environmental and social impact assessment (ESIA) process for the mining operations in ML 245. At this stage, I&APs were encouraged and informed of the importance of raising any concerns and comments related to the proposed operations on ML 245, which are to be considered in the ESIA studies and submitted along with the application for an environmental clearance certificate to the competent authorities and MEFT for a record of decision.

The main components of the environmental assessment identified for consideration in the ESIA were discussed, such as, aspects and concerns raised about the impacts of mining operations on water availability, social impacts and the river diversion impacts downstream and how mitigation and monitoring measures will be enforced, which will form an important part of the impact study for the proposed Project. The current phase aims to involve and engage I&APs to develop target-specific Terms of References (TOR) for necessary specialist studies required to address all identified concerns and potential impacts in the assessment report.

1.3 KEY FEEDBACK ON ISSUES OF CONCERN – PUBLIC MEETINGS

The summary of comments received from the public meetings present useful and valuable input in setting out the scope for the environmental and social impact assessment through questions

asked and points raised. An overall review of the recorded statements, the key common themes of concern that were raised can be summarised in the following categories:

1.3.1 COMMUNITY BENEFIT FROM THE PROJECT

Participants inquired on what Gergarub's approach would be towards community social responsibilities for the town and brought up suggestions such as opening vocational school, as this would enable community members to be qualified and employed by the mine and various other community projects. The Proponent responded that this would be a challenge as the company would first have to begin generating an income before pursuing such activities. Another point of social concern raised was the current state of health facilities that needed upgrading. The proponent responded that it was the government's responsibility to upgrade the clinics, however the proponent would investigate initiatives in which they could aid in the process.

1.3.2 DUST CONTROL

Another major concern raised by the I&APs was on dust was raised. The community has already experienced a significant level of negative impacts from dust on windy days when dust is blown from the waste rock dumps at Rosh Pinah Zinc Mine towards the town. The environmental practitioner assured the participants that this impact would be thoroughly looked at along with the cumulative impact of dust coming from the Rosh Pinah Zinc Mine. Furthermore, mitigation and management measures would be incorporated to deal with this impact in the environmental and social management plan.

1.3.3 LOCAL RECRUITMENT

I&APs are concerned that the Gergarub Project will only employ people from outside of Rosh Pinah overlooking local workers. Which further decrease their chances of gaining future employment as they are not given the opportunity to gain skills and experience. They therefore suggested a initiative to train locals before the mine open for operation to equip them with the skills to make them eligible to apply for jobs at the mine.

2 ACKNOWLEDGEMENTS

To conclude all meetings, ECC expressed gratitude towards all I&APs for attending and providing valuable feedback during the public and stakeholder consultations. The Proponent and ECC aimed to create a forum for I&APs to express their concerns and address them through the public consultation process.

ECC further acknowledged that constructive feedback from I&APs leads to a more robust and improved ESIA. This process enables a project that is comprehensible to the community and I&APs. The feedback received from I&APs will assist in identifying potential impacts that require assessment and concerns that need to be addressed as the project advances.

2.1 DETAILED COMMENTS AND RESPONSES FROM THE PUBLIC MEETINGS

The formal period for interested and affected party registration started on 22 February 2023, and closed on 28 February 2023, for initial feedback. Feedback was gathered through public meetings, email and has been documented in the scoping report. Corresponding responses to this feedback have been included in the tables provided below.

Additional feedback is encouraged even after the public consultation period has ended, and the period for I&APs to provide feedback will remain open until the final assessment report for the project is prepared for submission to the competent authorities.

Table 1 - Comments and feedback from the Rosh Pinah public meeting

Thursday 2nd March 2023, 17h00 Address: Kurper Street, Rosh Pinah Community Hall			
Name	Details	Comment or question received	ECC response or clarification
P. Jacob	Owner farm Spitskop	Raising the issues of dust control and environmental problems when project is done.	The impact will be thoroughly looked at along with the cumulative impact of dust coming from the Rosh Pinah Zinc Mine. Furthermore, mitigation and management measures would be incorporated to deal with this impact in the environmental and social management plan
		Please give us a timeline until 2026	The project aims to reach ground-breaking in 2025
Denis Johannes	Gardener	Water quality for the garden project	The water quality will be similar to Rosh Pinah's
		Why the project will only open in 2026 and not before	This is the necessary time taken by the relevant studies to assess whether the project is feasible
Indira	Tutungeni community	Who will form the 5% shareholding from the previously disadvantaged people	This is achieved through the 49% owned by Rosh Pinah out of that 10 % is for the PE miners and 1% is for the Rosh Pinah employees and that makes out the 5%.
Kanduka	Community member	How about agricultural projects and which water will be used	This question doesn't apply to this project, however, the two operations (Trevali and Vedanta, who are the co-owner of the Gergarub Project) are looking at creating a community garden in the long term
Owen Puley	Skorpion Zinc	What is the foreseeable workforce for the Gergarub Project	Housing is a known challenge in Rosh Pinah, and so is the case for having a proper clinic and facilities around town
Iboaatly Garoes	Community member	Private and public health facilities need to be looked at, particularly with the influx of people.	The government have to upgrade the clinics, and as a company will optimize private and public healthcare.

<p style="text-align: center;">Thursday 2nd March 2023, 17h00 Address: Kurper Street, Rosh Pinah Community Hall</p>			
Name	Details	Comment or question received	ECC response or clarification
		Silicosis and tuberculosis are raising issues; dust is blown from the tailings very frequently	Mitigation measures will be put in place to reduce the impact of dust and protect the employees as well as the community. The risk of silicosis will be assessed during the impact assessment process.
Benedict Philander	Skorpion Zinc	Housing in Rosh Pinah	If the Gergarub Project takes off without a refinery, housing is seen sufficient. Should the final product be refined, there may be a shortage, however this will be addressed should that problem arise, it will be addressed.
Ester Katjivikua	Community member	Will a VTC be opened in town as part of the project CSR. Will there be training provided, and in which sector. The project is held by 2 active mines which are already in the place.	One must make money prior to starting with this. It is however known that is a national issue
Jimmy Boois	Community member	What are the options looked at in term of ore treatment	The idea is to have a standalone project
		Sometimes contractors are coming with their own staff whereas local people could have the right to be employed first	The EMP will make provisions for local employment notification

Thursday 2nd March 2023, 17h00 Address: Kurper Street, Rosh Pinah Community Hall			
Name	Details	Comment or question received	ECC response or clarification
Leonard Andreas	Community member	Redefining the timeline	The ground-breaking is first spade hitting the ground
S P Shigwedha		Schools were assisted by the mines, but now the passing rates are dropping	Not applicable to the Gergarub Project and is a RoshSkor matter
		What is done to control dust?	Mitigation and management measures would be incorporated to deal with this impact in the environmental and social management plan
P. Kayundu	Roads Authority	Can the traffic assessment be done in collaboration with RA.	Noted
N. Kaanduka	Scorpion Zinc	How about the stakeholder engagement	Not applicable to the Gergarub Project and is a RoshSkor matter
Unidentified Individual	Community member	In the past they have observed fire that claimed life. What can be put in place to help reduce the losses of lives, maybe as a CSR. Build a fire brigade.	The project will evaluate CSR projects as the project and community needs evolve.

Table 2 - Comments and feedback from I&APs via email during the public registration period

Comments received via email during the I&AP registration period			
Name	Stakeholder Details	Comment/Question Received	Response/Clarification
Ockert Sales	Coleman Transport Pty Ltd; Transport, Logistics and Warehousing services	I look forward to new developments in the area and trust that the relevant parties will perform their duties and responsibilities to the best of their abilities.	Comment noted.
Alexander Maasdorp	RoshSkor Township (Pty) Ltd; Municipal related services for Rosh Pinah	Excited about the local economic development that would be attracted to Rosh Pinah.	Comment noted.
		Employment opportunities to be afforded to local Rosh Pinah residents to curb unemployment and social problems associated with unemployment.	Comment noted, this will be looked at as part of the impact assessment.
		Allow local businesses and contractors the opportunity to deliver services to the project.	Comment noted, this will be looked at as part of the impact assessment.
Leonard Andreas	Dranole Investment Cc	I am an active youth leader who intend to empower and motivate fellow youth in engaging through political, socially surround the universe/environment for their better lifestyle.	Comment noted.
Petrus Kayundu	Roads Authority. Rosh Pinah Weighbridge	The Weighbridge Is situated 500m from the drilling site. Will there be any change on the C13/M0118 route?	At this current stage there will be no changes to the C13/M0118 route.
Thadeus Lyambezi Ndjengwa		As a resident of RoshPinah town, we are not happy since Skorpion Zinc mine closed. People are suffering so much; therefore, we are extremely support and interested Gergarub mine to be open.	Comment Noted this will be looked at as part of the social part of the assessment.

APPENDIX A – ADVERTS

TUESDAY 21 FEBRUARY 2023 Market Watch Republic of South Africa Sun 17 Allgem. Zeitung 3

Economic Indicators

Exchange Rates		Forward Cover						
Currency	Spot	Currency	Spot	1M	3M	6M	12M	
USD/NAD	18.1305	NAD/USD	0.079927	USD/ZAR	18.1847	1.62773	18.4021	18.8426
EUR/NAD	19.36247	NAD/EUR	0.088518	EUR/ZAR	35.23035	3.541859	35.67781	36.15367
GBP/NAD	21.79767	NAD/GBP	0.7255514	GBP/ZAR	39.65901	3.984411	40.14148	40.67754
NAD/CHF	0.3789978	NAD/JPY	7.40	ZAR/JPY	7.3498	7.2480	7.0987	6.9093

Please call your Private Banker or alternatively SMS PMM to 34778
*Where necessary (remittances will be applied)

Introducing
Forex on App

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COMPANY NEWS IN BRIEF

MERCEDES CAR PRICES HAVE ROCKETED

Driving a shiny new Mercedes-Benz may soon become a distant dream for many but the most affluent. The average price of a Mercedes reached some R72 900 (R1.4 million) last year – a 4.3% increase over 2019 levels. That comes with the carmaker's push to further upmarket by focusing on top-end models like the S-Class sedan to bolster profits. The company has been working through pent-up demand after chip shortages curbed production last year. Mercedes is hiking the prices of entry-level models like the A-Class hatchback. Drivers are increasingly only able to buy versions of the car with bells-and-whistles options as standard. Mercedes isn't alone. Around the world, manufacturers are reaping the benefits of selling fewer but more expensive cars. In the US, average monthly payments for a new car nearly doubled from late 2019. And as battery-powered vehicles tend to cost more than the average combustion-engine car, the shift to EVs may make the affordability crisis even worse. -Rex4

INDIA ACCUSES BBC OF TAX EVASION

India's Ministry of Finance has accused the BBC of tax evasion, saying that it had not fully declared its income and profits from its operations in the country. Indian tax authorities ended three days of searches of the British broadcaster's New Delhi and Mumbai offices. Without naming the BBC, the Central Board of Direct Taxes said on Friday in its first official statement since completing the office inspections that its "survey revealed that despite substantial consumption of content in various Indian languages (apart from English), the income or profits shown by various group entities is not commensurate with the scale of operations in India". "During the course of the survey, the department gathered evidence pertaining to the operation of the organisation which indicates that tax has not been paid on certain remittances which have not been disclosed as income in India by the foreign entities of the group," it said. Critics of Prime Minister Narendra Modi have questioned the timing of the searches, which came after India reacted angrily to a documentary by the British broadcaster which focused on Modi's leadership as chief minister of the western state of Gujarat during riots in 2002. Reporters Without Borders, an international media watchdog, denounced the government's action as "attempts to damp down on independent media". -Rex4

OLD MUTUAL BUYS DIGITAL WILLS STARTUP

Within days of Sanlam buying a stake in estate planning company Capital Legacy, its biggest competitor, Old Mutual, has announced plans to boot up its wills business too. The green insurer has acquired online wills startup, QuickWill. Old Mutual said this acquisition will help it to offer a more comprehensive digital wills solution in its banks in just a few months of operation. Old Mutual said this would be an extension of the services that its financial advisors and business partners already offer. This acquisition, backed by Old Mutual's new growth and innovation unit, NextT76, is one of a series of strategic moves Old Mutual has made to future-proof its business since it formed that unit. NextT76 was founded to help Old Mutual create businesses that deliver disruptive and sustainable growth. Although insurers have always had wills businesses, they've woken up to the growth potential of that business as new disruptors entered the market, reaching corners that traditional insurers have struggled to reach – especially low-income households. Old Mutual pointed out that a staggering 70% of South Africans still die without a valid will. -Rex4

NOTICE OF AN ENVIRONMENTAL ASSESSMENT AND PUBLIC MEETINGS FOR THE PROPOSED GERGARUB MINE ON ML 245, //KARAS REGION, NAMIBIA

Environmental Compliance Consultancy cc, pass the information to members of the public that an application for an environmental clearance certificate in accordance with the Environmental Management Act, No. 7 of 2007, will be made for the proposed Gergarub Mine on ML 245, //Karas Region, Namibia. Members of the public are invited to participate in the environmental clearance application process.

Applicant: Gergarub Exploration and Mining (Pty) Ltd, Environmental Assessment
Project Name: Gergarub Mine
Location: Environmental Compliance Consultancy (//Karas Region, Namibia)

Project Location: Gergarub Mine (ML 245) located on the farm Spitzkoppe 71 approximately 10km south-west of Skorpion Zinc Mine and 12km north-west of Rosh Pinah Mine.

Proposed Activity: Gergarub Exploration and Mining (Pty) Ltd proposes to construct and operate an underground zinc, lead and silver mine on ML 245. The mining method for Gergarub will be long-hole open stoping (LHOS) with drill, raise, drift, raise, drift in a sequence (bottom-up) extraction sequence. LHOS will be supplemented with Drift and P (D&P) mining which will be used to maintain continuity between and underneath the overall recovery of the Mineral Resource estimated at 101 Mt.

Public Meeting: **Where:** Tuesday, 20 February 2023
Address: 10 Robert Mugabe Avenue, Windhoek
Hours: 08:00 to 17:00 at the Scientific Society
Book Place: Thursday, 2 March 2023
Address: Kupper Street, Rosh Pinah
Hours: 08:00 to 17:00 at the Rosh Pinah Community Hall

Right to be Heard:
1. Please register as an I&AP
2. Register for the project at: <https://www.environmental.com.na/gergarub-ml-245-iaap>
3. Register at the project site or call ECC to register.
4. Register at the project site or call ECC to register.
5. Register at the project site or call ECC to register.

In addition to the above meetings, Gergarub Exploration and Mining (Pty) Ltd is committed to engaging affected stakeholders through planned and ongoing public participation as required.

Contact Information:
Registration Number: CC2018/19104
Members of the Board: www.environmental.com.na/
Website: www.environmental.com.na/
Phone: +264 61 469 7618
Mobile: +264 81 200 2000
Project ID: ECC-99-425-REP-09-D

signal

Signal Aviation Services (Pty) Ltd is an Aviation Training Organisation based at Eos Airport – Windhoek and has the following vacancy available. We invite all suitably qualified candidates to apply before or on Friday, 10 March 2023.

CHIEF TECHNICAL INSTRUCTOR / PERSON RESPONSIBLE TRAINING

Requirements:

- ICAO Maintenance Instructor Licence
- ICAO ABE Licence
- ICAO Apprentice Instructor Rating
- ICAO Maintenance Human Factors Rating
- 10 years experience as Maintenance Instructor
- 5 years experience as director/supervisor management in aviation training organisation relating to AME training
- Must have held accountable manager position in an ATO

Duties and Responsibilities:

- Responsible for day-to-day operation of AME training facility
- Responsible for syllabi and course development
- Liability with NCAA and stakeholders
- Management of technical instructor staff
- Management of technical staff competencies
- Implementing of train-the-trainer courses for technical staff
- Maintaining of training standards
- Performing duties as training and evaluation facilitator

CV's can be submitted for the attention of the HR Officer – Signal Aviation Services (Pty) Ltd
glenn.crow@signal.com.na

With the subject:
Vacancy – Chief Technical Instructor/Person Responsible training

Only shortlisted candidates will be contacted. The Weisbar Group of Companies is an equal opportunity employer.

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Dr Weder, Kautz & Hovska Inc. has a resourceful and pioneering litigation practice, which is a full-service department covering all areas of litigation ensuring that our clients get the best legal expertise. Our legal practitioners have always believed in the highest level of integrity, followed a people-oriented approach, and given back to the society whenever possible. We continue to follow the principle of "client first" in providing reliable and highly effective service.

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With 12 dedicated litigators at director level, the Firm has comprehensive litigation experience in the following fields of litigation: civil, insurance, commercial, criminal, collections, and divorce matters. The firm maintains its commitment to provide the best legal advice and representation in the Namibian Courts, utilizing years of legal expertise and experience to offer the most efficient solutions to legal and bureaucratic obstacles to foreign investors and local businesses alike.

DR WEDER, KAUTZ & HOVSKA INC.

4 Republicain Sun AZ Allgemeine Zeitung Market Watch TUESDAY 28 FEBRUARY 2023

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WATCH OUR WEEKLY SHOW: TUESDAYS @ 21H00 ON NTV, AND ONEUP.TV.COM OR VIA FACEBOOK ON THE NAMIBIAN SUN, ALLGEMEINE ZEITUNG AND REPUBLIKAIN PLATFORMS, AT 19H00

SPONSORED BY NEO PRINTS

For effective waste removal Recycling Namibia

Rent-A-Drum was established in 1989 and has grown into the biggest private enterprise of its kind in the country.

Rent-A-Drum is a leading organisation in waste management and recycling in Namibia and offers the most comprehensive services to local corporations, mines and smaller companies, including residents of Windhoek, Swakopmund, Walvis Bay, Oshana, Oshana-Namib and Tlokweng.

Speaking to commercial manager Jaco Swart, he said that what began as a small business collecting household and garden waste 34 years ago has since grown exponentially.

"In 2009 we started with recycling. Since then we have expanded all over Namibia. Today Rent-A-Drum is a household name that provides a one-stop service to residents and businesses across the country. We believe in a totally integrated waste management solution for our clients."

When asked what brought about the growth, Swart said that the first thing they provide is a professional service to all their clients, "and we understand that they need. We also offer a much wider list of client services from when we started 14 years ago," he said. Besides their main branches, they also have satellite depots at Langer Heinrich, Husab and Tlokweng.

In terms of specialised services, Rent-A-Drum assists the mining industry, "especially since there are much more hazardous waste that we have to deal with. We also assist with demolishing old buildings and scrap removal. We're also involved in



Abraham Reinhard is the operations manager for recycling at Rent-A-Drum.

the oil and gas industry, to provide a full-scope service," he said.

Teaching the youth

Rent-A-Drum is currently running a social media campaign to teach waste management to children.

Speaking to Abraham Reinhard, who is the operations manager for recycling, he said that this practice is vital to the entire country. "It is important that waste that ends up at landfills or at dump sites is recycled. Instead of plastics being blown away by the wind, we really want to make sure that each and every individual recycles."

He said that they often have children visiting their facility. "We try to carry the message across clearly so that they can go home and start recycling. It's very good to make them aware from a young age so that they can really understand what it's all about - that whatever recyclables are used at home should not end up at a landfill, but rather be recycled."

When it comes to what parents can do, he says that they play an integral role in teaching their children what can be recycled. "That's why we

enrolled the clear-bag systems for homes. These bags are provided free of charge, so too is home collections thereof."

He says what measures their success in this, is that people began calling them, telling them that their household waste going to the municipal landfill is as little as 10% of what it was before.

So, why recycle? "The three R's: Reuse, recycle and re-use again. That's the only way we can get all recyclable items back into the system instead of on a landfill. All you need to do at home is place all your cans, plastic bottles, paper and carton into the clear bag, we will pick it up, and we will recycle it!"



The Safland Property Group recently broke ground for the development of the second-largest distribution centre to be built in Namibia in the last six years.

The Safland Property Group recently broke ground for the development of the second-largest distribution centre to be built in Namibia in the last six years, confirming the confidence this group and its development partners have in the country's economy.

The 14 650m² covered distribution centre (leasable space) which is being constructed on behalf of the Pepkor Group and P.E. du Toit Transport-

ers, and is established and managed by Safland, is located near the B1 highway at Brakwater on the outskirts of the capital and provides access to the main transport corridors through Namibia in all directions.

Safland director and trustee of the Frontier Property Trust, Kallio van der Merwe, said the Pepkor development is the 13th in the Safland group which already has a portfolio of around N\$9.8

billion and forms part of a pipeline of developments that will soon see the light of day.

The Pepkor development is valued at around N\$380 million. Safland believes that

the developments could generate up to 10 000 jobs for Namibians in the immediate future.

The development is planned to be complete by the end of November this year.

skorpion elec TREVALLI

NOTICE OF AN ENVIRONMENTAL ASSESSMENT AND PUBLIC MEETINGS FOR THE PROPOSED GERGARUB MINE ON ML 245, //KHAHAS REGION, NAMIBIA

Environmental Compliance Consultancy (ECC) provides this notice to members of the public that an application for an environmental clearance certificate in accordance with the Environmental Management Act, No. 7 of 2017 will be made for the proposed Gergarub Mine on ML 245, //KhaHAS Region, Namibia. Members of the public are invited to register as an interested and affected party (IAP), are invited to attend a public meeting and provide input into the environmental clearance certificate application process.

Applicant: Gergarub Exploration and Mining (Pty) Ltd
Practitioner (EAP): Environmental Compliance Consultancy
Location: //KhaHAS Region, Namibia

Project Location: On mining license (ML 245) located on the Farm Spitzkopf 17, approximately 10km south-west of Skorpion Zinc Mine and 15km north-west of Bush Prof. Mine.

Proposed Activity: Gergarub Exploration and Mining (Pty) Ltd proposes to construct and operate an underground zinc, lead and silver mine on ML 245. The mining operations for Gergarub will be long-hole open-pit (LHOP) with backfill mining along an eastward (bottom-up) extension to the mine. LHOP will be supplemented with drill and fill (D&F) mining which will be used to increase the overall recovery and to ensure the overall recovery of the mineral resource estimated at 101 Mt.

Public Meetings:
Windhoek: Tuesday, 28 February 2023
Address: 90 Robert Mugabe Avenue, Windhoek
Time and Date: 18:30 at the Scientific Society
Bush Prof: Thursday, 2 March 2023
Address: Garpe Street, Bush Prof
Time and Date: 17:00 at the Bush Prof Community Hall

Register & Attend:
1. Please register as an IAP
2. Register for the project at: <https://www.environmental.com.na/track-the-proposed-gergarub-mining-project-on-ml-245-in-//kha-has-region-namibia>
3. Registered IAPs will receive a pre-registered Information Document (PID)

In addition to the above meetings, Gergarub Exploration and Mining (Pty) Ltd is committed to engaging affected stakeholders through planned and ongoing public participation as required.

Environmental Compliance Consultancy
Registration Number: EC/2019/18434
Mines Act No. 75 Of 2012 Lic No. 101
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Tel: +264 81 869 7638
E-mail: info@eccenvironmental.com
Website: <http://www.eccenvironmental.com>
Project ID: ECC-99-425-NOT04-8

Synergy Through Diversity

"Dr Weder, Kautz & Hoveka Inc brings together a unique synergy of professional expertise, experience and skills, offering clients a comprehensive range of legal services founded on sound business practices and ethics and built around the client's needs and expectations.

Formed in September 2006, Dr Weder, Kautz & Hoveka Inc set precedence for transformation of its kind in Namibia when it merged two of the country's most prominent law firms – Dr Weder, Kruger & Hartmann (established 1949) and Kautz, Basson & Kamuhanga Inc (established 2000).

By combining the unique strengths and rich heritages of these two legacy firms, Dr Weder, Kautz & Hoveka Inc has been able to increase its capacity, not only in terms of its workforce, but also its various fields of expertise, experience and infrastructure.

The result is a large practice with a singular focus – to enable and deliver service excellence to its ever increasing and diverse client base."

APPENDIX B - STAKEHOLDER LETTERS



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www.eccenvironmental.com



ECC-99-425-LET-07-D

27 February 2023

Identified stakeholder and potentially interested or affected party for:

The proposed Gergarub Mine on ML 245 in the //Kharas Region, Namibia

Dear Sir or Madam,

**RE: NOTIFICATION OF AN ENVIRONMENTAL ASSESSMENT OF THE PROPOSED GERGARUB
MINE ON ML 245 IN THE //KHARAS REGION, NAMIBIA, AND AN INVITATION TO SCHEDULED
PUBLIC CONSULTATION MEETINGS**

Environmental Compliance Consultancy (ECC) has been engaged by Gergarub Exploration and Mining (Pty) Ltd, a subsidiary of Rosh Pinah Zinc Corporation (Pty) Ltd and Skorpion Zinc Company (Pty) Ltd the Proponent, as their environmental assessment practitioner. ECC is conducting an environmental and social impact assessment as a requirement for their application for an environmental clearance certificate in terms of the Environmental Management Act No. 7 of 2007. The assessment is for the proposed Gergarub Mine on ML 245 in the //Kharas Region, Namibia the farm Spitskop 111, along the C13 road between Rosh Pinah and Aus within the Oranjemund Constituency. The project is located approximately 10km south-east of Skorpion Zinc Mine and 15km north-west of Rosh Pinah Mine.

The mining method for Gergarub will be long hole open stoping (LHOS) with backfill, mining stopes in an overhand (bottom-up) extraction sequence. LHOS will be supplemented with Drift and Fill (DAF) mining which will be used to mine the orebody extremities and maximize the overall recovery of the Mineral Resource with an ultimate capacity of producing 150 000 t combined metal in concentrate from a diversified mineral production facility. The Background

ENVIRONMENTAL COMPLIANCE CONSULTANCY CC
PO BOX 91193 WINDHOEK, NAMIBIA
MEMBERS: J L MOONEY & JS BEZUIDENHOUT
REGISTRATION NUMBER: CC/2013/11404



Information Document (ID) provides further project details and the scope of the assessment, which can be downloaded from the link is provided below:

<https://eccenvironmental.com/download/the-proposed-gergarub-mining-project-on-ml-245-within-the-kharas-region-namibia/>

This letter is intended to engage potentially interested and affected parties (IAPs) for the Project and provide a communication channel to ECC for the ESIA process. You have been identified as an interested or affected party and therefore ECC wishes to inform you of how you can be involved with the ESIA.

As part of the assessment, Environmental Compliance Consultancy (ECC) herewith cordially invite you as an identified stakeholder, interested or affected party to the public engagement meetings scheduled for the following dates:

1st Public meeting:

- **Date:** 28 February 2023
- **Venue:** Namibia Scientific Society,
110 Robert Mugabe Avenue,
Windhoek
- **Time:** 18:30 PM

2nd Public meeting:

- **Date:** 2 March 2023
- **Venue:** Rosh Pinah Community
Hall, Kurper Street, Rosh Pinah
- **Time:** 17:00 PM

Public participation is an important part of the ESIA process, as it allows the IAPs to obtain information about the proposed project and provide feedback. Communication with the IAPs occurs at various stages throughout the Project lifecycle. IAPs can interact with the ESIA process by:

- Registering as IAPs for the project via the ECC website as per the link provided below:
<https://eccenvironmental.com/download/the-proposed-gergarub-mining-project-on-ml-245-within-the-kharas-region-namibia/>

If you are unable to complete the registration form online, please contact us via email for assistance at info@eccenvironmental.com , or alternatively call our office at: +264 81 669 7608.



ECC values community input and participation in our projects and we look forward to working with you as the project develops.

Yours sincerely,



Stephan Bezuidenhout

Environmental Compliance Consultancy
081 669 7608

Email: stephan@eccenvironmental.com



Jessica Bezuidenhout (Mooney)

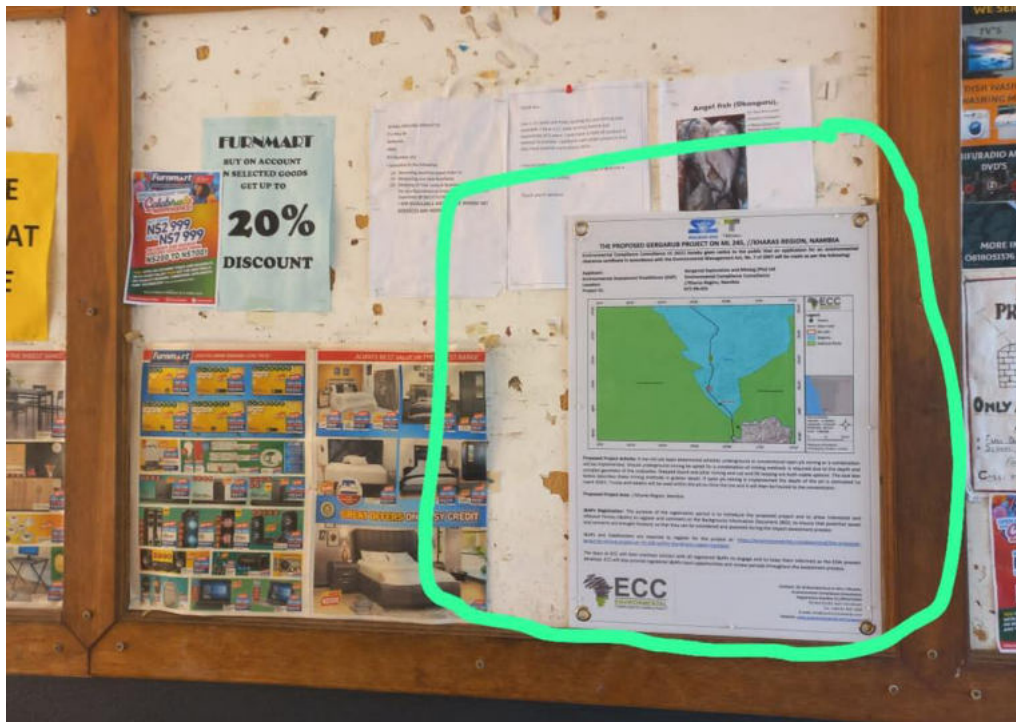
Environmental Compliance Consultancy
081 669 7608

Email: jessica@eccenvironmental.com

APPENDIX C - SITE NOTICES



GPS COORDINATES:
LAT: S -27.9664
LONG: E 16.75875



GPS Coordinates:
Lat: S 27.9664
Long: E 16.75875

APPENDIX D – BID

APPENDIX E – ATTENDANCE REGISTERS



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Meeting Attendance Register

Date: 02/03/2023

Meeting Subject: Gergarub Mining Project ESIA - Public Meeting

Venue: Community Hall - Rosh Pinah @ 17:00 (17:15)

	NAME	ORGANISATION	EMAIL ADDRESS	CONTACT NUMBER	SIGNATURE
1	P. Jakob	SITSKOP FARM	NETS@MTCNAMIBIE.com.na	0816464894	
2	J. GROENEWALD	NAMZINC	gcoenon@iway.na	0816201167	
3	ANTON MBUMBA			0818877534	
4	duica Marungu	NAMZINC	qcom.	0814892258	
5	Jafa Anton	Namibian	-	0818329553	
6	Jonas	LESTER		0814929696	
7	Benedict Philbert	Namzinc	BPhilander@vedantaresources.com.na	0813936977	
8	Theron Kavira	Rosh Pinah	skavira@brevall.com	0811290627	
9	Jimmy Beere	Community	kzisjimmy456@gmail.com	0815503998	
10	Linyando Peter	Community	-	0817788580	





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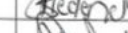
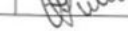


Meeting Attendance Register

Date: 02/03/25

Meeting Subject: Gergarub Mining Project ESIA - Public Meeting

Venue: Community Hall - Rosh Pinah (17:00 (17:15))

	NAME	ORGANISATION	EMAIL ADDRESS	CONTACT NUMBER	SIGNATURE
1	Fredrika Jaepa	Community	fredrika1jaepa@gmail	0816586926	
2	Paulus Nyanda	Community	Polennyanda@gmail.com	0813287609	
3	Secilia Shindinge	Community	secilia-ernvubale@gmail.com	0816197458	
4	Lydia Mbankwa	Rosh Pinah Mine	Lydiambankwa@gmail.com	082164695	
5	Juliet Yisa	RP. Mining	julietyisa@gmail.com	081134430	
6	Kaanduka N	Skorpion Zinc	kaanduka@skorpionzinc.co.za	081223544	
7	Veronica R. Riets	Riemeneke Ink.		0818329764	
8	Etienne Kerendere	Community Rosh	/	0818302995	
9	Bonitha Pratericks	Community		0812115425	
10	Owen Puley	Skorpion Zinc		0817856890	

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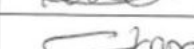



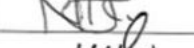



Meeting Attendance Register

Date: 02/03/23

Meeting Subject: Gergarub Mining Project ESIA - Public Meeting

Venue: Community Hall - Roshkor Pitsch (17:15)

	NAME	ORGANISATION	EMAIL ADDRESS	CONTACT NUMBER	SIGNATURE
1	Tsasekar Mubela	Community	/	081-8302995	
2	SALATIEL J. TOLHU	R.P. & C Imp.	salatashin@gmail.com	081-2847000	
3	SHWENI	TALUCKEY INVESTMENT	ndatara@yahoo.com	0816356626	
4	Ester Katjivikwa	Community Mem	dirakatjivikwa@gmail.com	0812105696	
5	pelgrina Kapere	community mem		0814142278 or 0817483569	
6	Ockent Sulu	Coleman Transport	osales@coleman-transport.com	0811267327	
7	Wilhelm	CCM	-	0812607745	
8	NH Nelumbu	Roshkorov Taship	hnelumbu@roshkor.com.na	0813224335	
9	STEWART AFRIKANER	NAMZINC	SAfrikaner@vedentaresources.com.na	0811617852	
10	Peta-S. Kayundu	Roads Authority	kayundup@ra.org.na	0816594480	

Ivan SAAL R-P

0814095031





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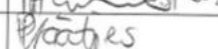
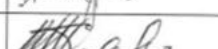
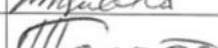

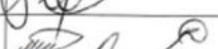

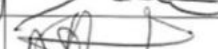
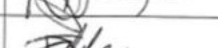
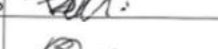


Meeting Attendance Register

Date: 02/03/23

Meeting Subject: Gergarub Mining Project ESIA - Public Meeting

Venue: Community Hall, Rosh Birch (17:15)

	NAME	ORGANISATION	EMAIL ADDRESS	CONTACT NUMBER	SIGNATURE
1	M. Avenolus	R/P		0812608013	
2	P. Plantjies	R.P	yaroky@gmail.com	0812608013	
3	H. Mulelet	R/P		081321344	
4	Mathias Tjameya	R/P	simon.peters@hignwachs	0816564949	
5	SP Shigwedha	TTC	ogmail.com	0813008480	
6	L. Leonard Andreas	DRANBLE ICC	leonardandreas78@gmail.com	0815582279	
7	Johannes Thomas	R/P	hcentipede@gmail.com	0818035601	
8	Tbaqobly Garoes	R/NRT	loganmalich@gmail.com	0818256034	
9	Deno rissa Frederick	CBY Youth	melviniafrederick04@gmail.com	0815274646	
10	Reuth	R/P	bee.michael69@gmail.com	0812063377	

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




Meeting Attendance Register

Date: 02/03/23

Meeting Subject: gergarub Mining Project ESIA - Public Meeting

Venue: Community Hall - Rosh Pimale (17:15)

	NAME	ORGANISATION	EMAIL ADDRESS	CONTACT NUMBER	SIGNATURE
1	Silonga	A.P.	Sih @Puu	0816291353	
2	Dennis J.S.K	GARDENS.com	dphannes456@gmail.com	081291113	
3	JOHANNES P. FREEMING	NONE	08/107 NONE	08/5782924	
4	NIKODEMUS Mela	NONE	snikodemus82@gmail.com	0818034332	
5	Petrus MPAREKE	NONE	-	0818417917	
6	Joseph T	N/A	Joseph.kaumba@gmail.com	0813164228	
7	NATHAN	N/A	-	0812114500	
8	Cornelius	N/A	CorneliusSkasanyo@gmail.com	0813968506	
9	KRISTOFIN	N/A	-	0813521196	
10	Rash Dmsmba	NA	N/A	08/5902211	

5)



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Meeting Attendance Register

Date: 02/03/22

Meeting Subject: Gergarub Mining Projects - Public Meeting

Venue: Community Hall - Rosh Pinah (17:15) → 18:45

	NAME	ORGANISATION	EMAIL ADDRESS	CONTACT NUMBER	SIGNATURE
1	<u>E. Ametony</u>	<u>R.P</u>	<u>sim@t...</u>	<u>0812311100</u>	<u>[Signature]</u>
2	<u>Mtama</u>	<u>R.P</u>	<u>max</u>	<u>0814321980</u>	
3	<u>ANTONIO</u>	<u>R.P</u>	<u>J</u>	<u>0812361531</u>	
4	<u>Lisias Petrus</u>	<u>Honesty/contract</u>	<u>lisiaspetrus10@gmail.com</u>	<u>0815822233</u>	
5					
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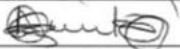





Meeting Attendance Register

Date: 28-02-23

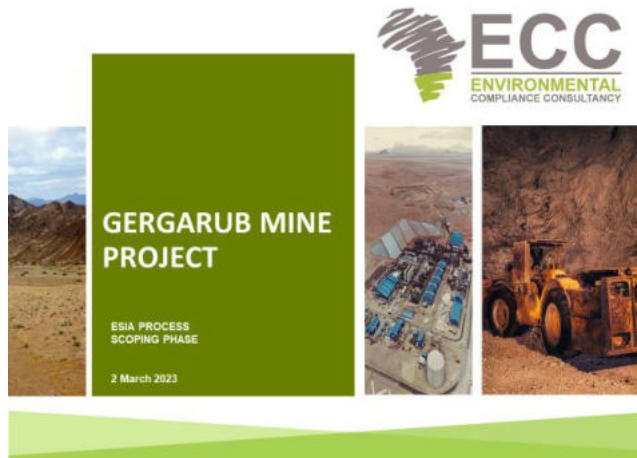
Meeting Subject: Gergarub Mine ESIA - WHK Public Meeting

Venue: Namibian Scientific Society

	NAME	ORGANISATION	EMAIL ADDRESS	CONTACT NUMBER	SIGNATURE
1	Eshon Kavira	Rosh Pirah Zim/Nis	skavira@traali.com	0811290627	
2	A. O. Ocuuko	Rosh Pirah Com	layacuuko@pekepeni.com	0812679426	
3	G. MADOC	ECC	gwendal@eccenvironmental.com	0813266813	
4	S. Shingumba	ECC	samuel@eccenvironmental.com	0814765261	
5	M. Jarrett	ECC	monique@eccenvironmental.com	0813811474	
6					
7					
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9					
10					



APPENDIX G – PUBLIC MEETING PRESENTATION



Welcome



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AGENDA



- Background Information
- Gergarub Presentation – *Presented by Sheron Kaviua (Trevall/RPZC)*
- Public Participation
- Baseline Studies
- Environmental & Social Impact Assessment (ESIA) – *Presented by ECC*
- Questions and Answers

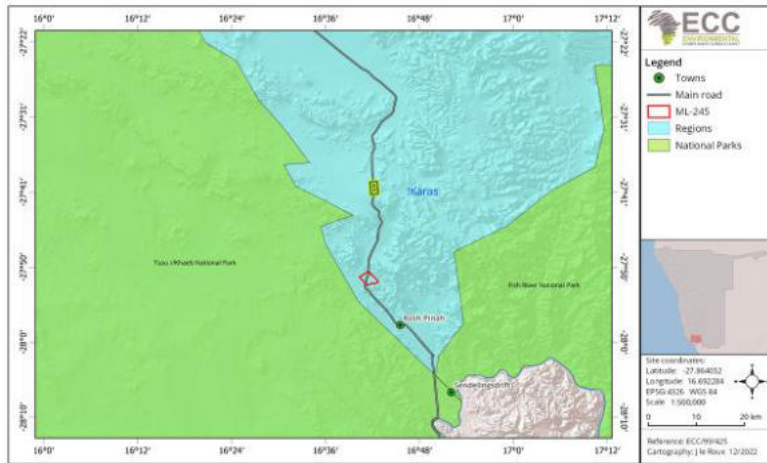
Main Objectives



- ✓ Provide information describing the planned Gergarub Mine Project and associated activities;
- ✓ Provide an independent environmental and social impact assessment of the activities associated with the proposed mining project; and
- ✓ Describe management and mitigation measures associated with any identified potential impacts where necessary.

3

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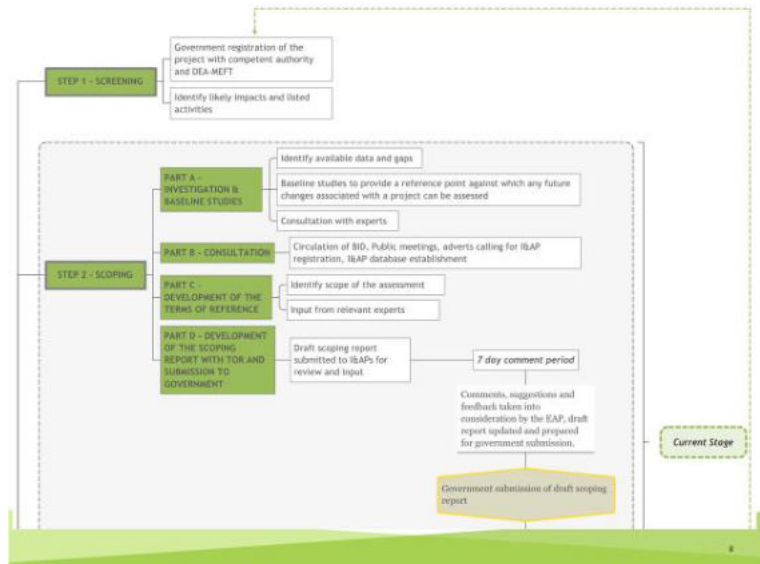
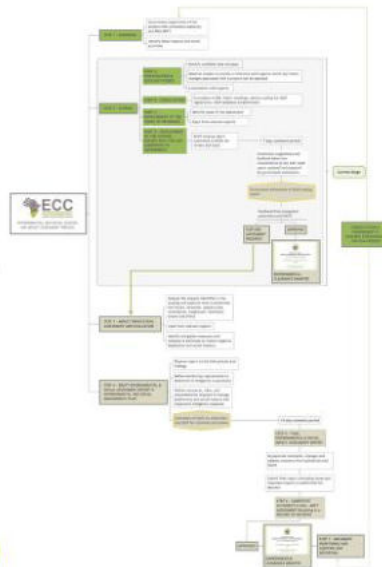
ESIA Process

- Screening – APP-000785 (DEA PORTAL)

ACTIVITIES THAT TRIGGERED A CLEARANCE CERTIFICATE APPLICATION
ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES
WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES
MINING AND QUARRYING ACTIVITIES
FORESTRY ACTIVITIES
WATER RESOURCE DEVELOPMENT
HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE
INFRASTRUCTURE

6

ESIA Process



8



Gergarub Project

Public Consultation

2023



All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Agenda



- 1 Overview of the Gergarub Project
- 2 Project Location
- 3 Mining License
- 4 Site layout
- 5 Geology & Drilling
- 6 Resources
- 7 Alternatives and Innovation
- 8 Mining Method
- 9 Ore Processing Methodology
- 10 Employment and personnel
- 11 Corporate and Social Responsibility Plan

All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Overview of the Gergarub Project



- The Gergarub deposit was discovered in 2008 and is now jointly owned by SZM and RPZC.
- Shareholding: RPZC 49% ; Skorpion 51%.
- Deposit Type: volcanogenic-hosted massive sulphides (Proximal), with Zinc & Lead as major ore elements, silver and gold as the by-products.
- Orebody is lentic and truncated by mafic intrusives.
- A bankable feasibility study was completed for Gergarub in 2014 which found that the project could not be economically extracted, recent scoping studies by AMC & ABGM were completed in 2022.
- In 2017 a Mineral Deposit Retention License (MDRL) was issued.



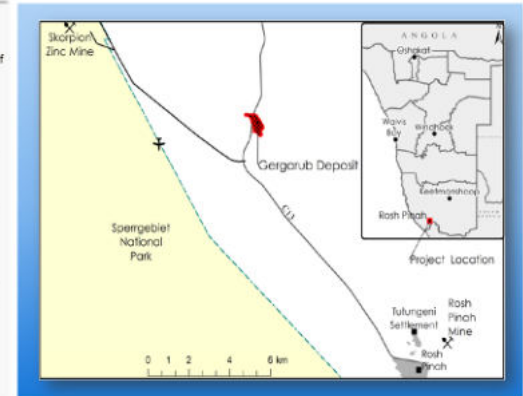
All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Project Location



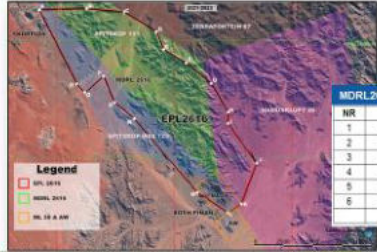
- The Property is located in southwestern Namibia, 15km north of the town of Rosh Pinah.
- The nearest commercial airport is located at Oranjemund, approximately 105 km southeast of Rosh Pinah, via a tar road C13.
- Rosh Pinah is located approximately 800 km south of Windhoek, Namibia's capital city.
- The town of Rosh Pinah lies along a major tourism route within the A1-Ais Richtersveld Transfrontier Park.



All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Mining License



NR	Latitude	Longitude
1	-27° 50.56'	16° 41.30'
2	-27° 52.54'	16° 42.47'
3	-27° 52.24'	16° 42.21'
4	-27° 52.26'	16° 41.52'
5	-27° 52.46'	16° 41.24'
6	-27° 51.32'	16° 40.20'

Beamer 1641 Spheroid

Tenement	Status	Granted	Expires	Comments
MDRL2616	Active	16 Aug 2017	03 Aug 2022	Active, however, the application for a Mining License was submitted on the 15th of May 2022.
ML245	Notice to grant	10 Aug 2022	-	ML valid for twenty (20) years period from the date of acceptance Provide the Environmental Management Plan Report (EMPR) within twelve (12) months Proof that at least 5% voting shares are held by historically disadvantaged Namibians.
ECC for MDRL2616	Active	24 Jan 2022	25 Jan 2025	Valid for three (3) years Renewal to be submitted within a period not exceeding one month.

All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Site layout



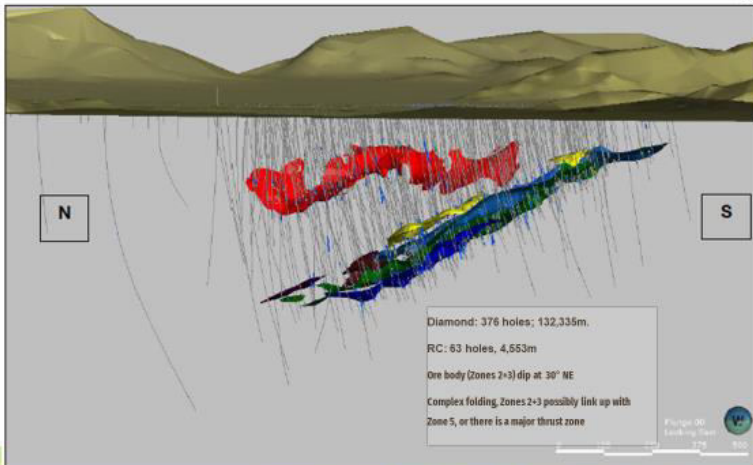
- Tailings storage facility
- Waste rock dump
- Fuel farm
- Site storage
- Maintenance and repair facilities
- Explosives magazines
- Sewage treatment & paste fill plant
- Underground dewatering
- Compressed air
- Water supply
- Mines rescue facilities
- Main power sub-station
- Mine ventilation
- Change house
- Engineering & administration buildings
- Site security

The infrastructure requirements for Gergarub were assessed in detail during the SRK FS. Outputs from the 2022 AMC study have since resulted in Gergarub selecting an updated mining strategy. Infrastructure requirements were not assessed in detail during the AMC study which was completed at a scoping study level of accuracy.

All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Geology | Drilling

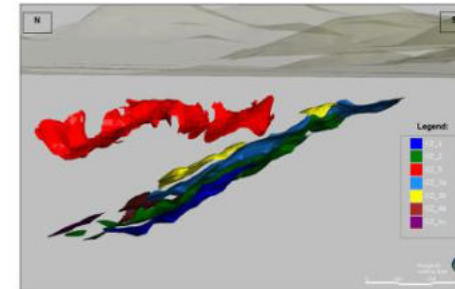


Diamond: 376 holes; 132,335m.
RC: 63 holes; 4,653m
Ore body (Zones 2+3) dip at 30° NE
Complex folding Zones 2+3 possibly link up with Zone 5, or there is a major thrust zone

All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Geology | Drilling



- Deposit strikes 1,100m by 360m wide
- Drilling activities used in the estimation (October 2013):
 - Diamond: 349 holes, 242 intersected mineralization, maximum depth of 679m.
- Total drilling (02, 2022):
 - Diamond: 376 holes; 132,335m.
 - RC: 63 holes; 4,653m

Historic Mineral Resource as of Oct 2013 @ 4% Zn + Pb cut-off

	Mt	Zn%	Pb%	Ag (ppm)
Total indicated	11.36	9.13	2.48	43
Total inferred	6.72	7.92	2.17	36
Total Resources	18.08	8.68	2.37	41

All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.

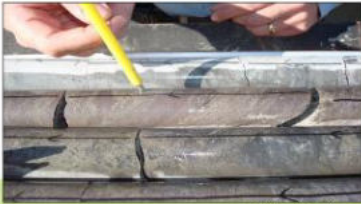




Geology | Mineralisation



- Laminated sphalerite-galenite with minor chalcocopyrite
- Pyrrhotite, pyrite, calcite, tremolite, quartz gangue
- Host rocks carbonaceous argillites in otherwise monotonous arenaceous turbidite succession with mafic intrusives (biotite-amphibole schist)



All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



Alternatives & Innovation



THIS SLIDE SUMMARISES THE ALTERNATIVES THAT WERE CONSIDERED FOR MINING THE GERGARUB DEPOSIT AND THE TRADE OFF STUDIES THAT WERE CONDUCTED. FURTHER STUDY WORK AND ADDITIONAL ANALYSIS IS REQUIRED TO CONFIRM ASPECTS OF THE DESIGN MANDATE CASE.

Findings

AMC STAGE 1

- Both the geological and Mineral Resource estimation report supporting the Gergarub FS 2014 and Gergarub 2013 Mineral Resource estimates are lacking substantial detail and are insufficient to support the public declaration of a Mineral Resource estimation.
- A new tailings storage facility (TSF) is required at Gergarub.
- The open pit with lateral mining and underground longhole open stoping without backfill options were not recommended for further study.

AMC STAGE 2

- The case selected to advance operations at Gergarub is Case 4b – LHOS + DAF @ 100 Mtpa producing zinc concentrate.
- AMC observes the peak value occurs at an NSR cut-off of US\$100/t.
- The production rate is 1 Mtpa.
- Operating LOM is 11 years.
- Results pointed to earlier production of 2026

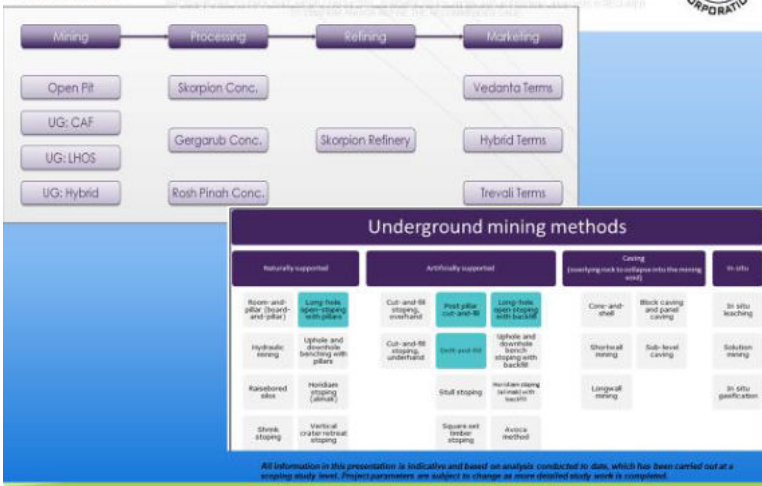
ABGM

- The study indicates that it is technically feasible to achieve the design mandate of 150 ktpa of metal in concentrate by a combination of open pit and underground mining.
- To sustain such production over LOM exceeding 10 years will require significant additional Mineral Resources, which in turn requires an intense exploration programme.
- The economic analysis of the 150,000 t MIC design indicates that this configuration will be financially vulnerable in most foreseeable scenarios.
- Operating LOM is 13 years

All information in this presentation is indicative and based on analysis conducted to date, which has been carried out at a scoping study level. Project parameters are subject to change as more detailed study work is completed.



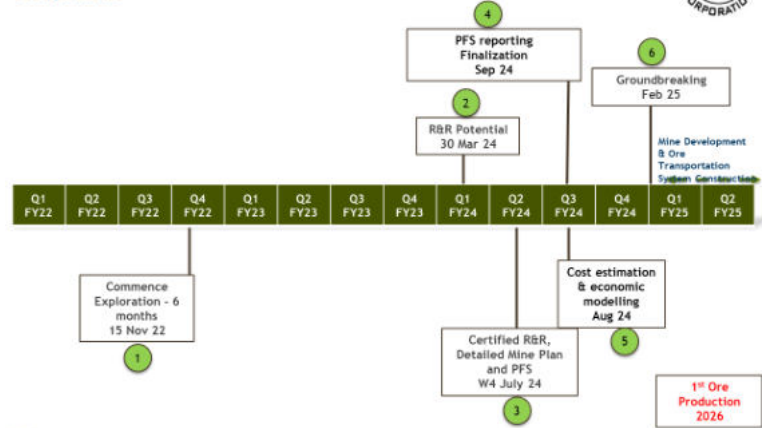
Alternatives & Innovation



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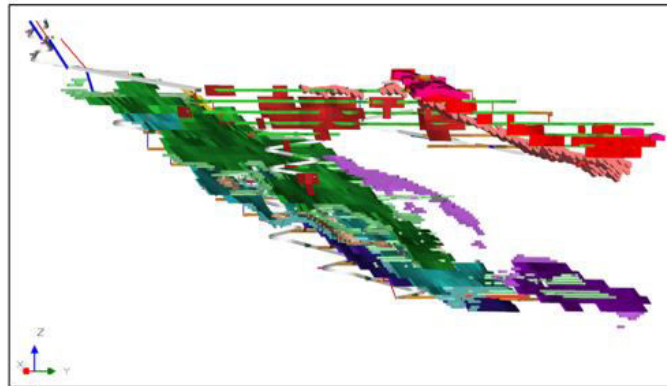
Indicative Mining Timeline



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Proposed Mining Method

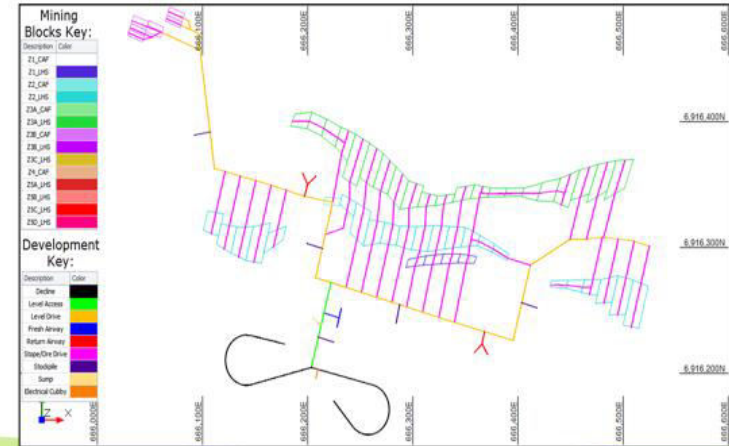


- LHOS: Technically feasible for the majority of the Gergarub deposit, suitable for areas of sub-vertical to moderate dip, and lenticular to tabular geometry.
- DAF: Technically feasible for the areas of the Gergarub deposit not favorable to LHOS, suitable for flat to vertical dip, and lenticular to narrow vein geometry.

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Proposed Mining Method



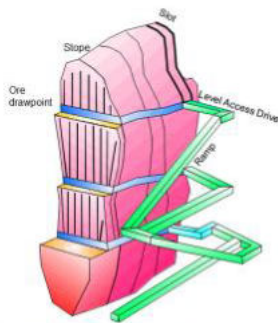
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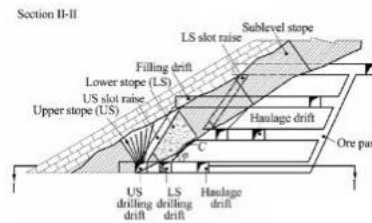
Proposed Mining Method



Sub Level Open Stopping



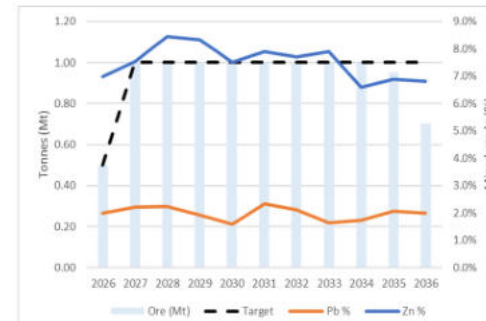
Drift and Fill



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Indicative Mining Schedule



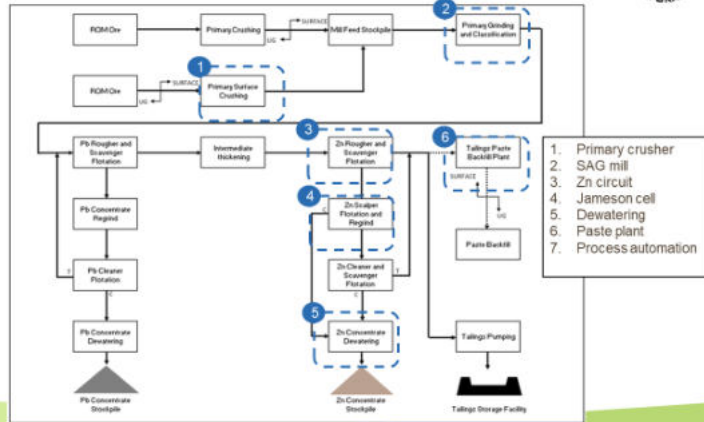
- Material above an NSR cut-off of US\$100/t for O2I-4 and O2S can be considered strategically optimal to maximize the project value.
- Steady-state ore production of 1.0 Mtpa can be achieved for 8 years of the 11-year LOM.
- Mining with backfill will significantly increase recovery of the available mining inventory, while decreasing the capacity of the tailings storage facility (TSF).
- Using truck haulage (up a 1 in 7 gradient decline) is best suited to the highly variable geometry of the orebody and the low production rate.

Item	Unit	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Che	Mt	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.70
Pb	%	2.0%	2.2%	2.2%	1.9%	1.6%	2.3%	2.1%	1.6%	1.3%	2.1%	2.0%
Zn	%	7.0%	7.5%	8.4%	8.3%	7.5%	7.9%	7.7%	7.9%	6.6%	6.9%	6.8%
Ag	g/t	33.9	51.1	41.6	39.8	25.9	32.8	22.2	19.9	30.6	23.8	
NSR	US\$/t ore	128	145	155	140	126	145	138	131	113	126	122

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Ore Processing Methodology



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Employment and personnel



The estimated total staff requirement including the absentee allowance for Gergarub is shown in the Table below, peaking at 594 total personnel.

Annual Gergarub personnel requirements

Item	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Mining personnel	296	344	344	360	360	344	360	360	376	344	255
Process personnel	172	172	172	172	172	172	172	172	172	133	133
G&A personnel	46	46	46	46	46	46	46	46	46	36	32
Total	514	562	562	578	578	562	578	578	594	513	420

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Proposed Ore Processing Methodology



- The construction and commissioning of a 1.0 Mtpa concentrator at Gergarub is proposed to process the mined ore.

Key aspects of the proposed concentrator include:

- The expected metallurgical performance projections for the concentrator is an approximate average recovery of 91.1% for zinc, 74.1% for lead, and 51.6% for silver.
- The average zinc concentrate expected is 51.2% and lead concentrate grade at 58.2%.
- The milling circuit consisting of a SAG mill operating at throughput of 132.5 tph is proposed. The proposed SAG mill will be a 6.1 m x 2.36 m EGL with 1.8MW motor and open grate discharge operating in closed circuit with primary and secondary cyclones to produce a combined feed slurry at a P80 particle size of 90µm to the flotation circuit.
- The proposed lead flotation circuit is of conventional design inclusive of a rougher, scavenger, and a cleaner flotation circuit with regrind. The circuit will have an effective capacity of 0.75 m3/t/h and a required flotation volume of approximately 99 m3.
- The proposed zinc flotation circuit will have a capacity of 2.6 m3/t/h and a required flotation volume of approximately 343 m3. This will generate an overall residence time of the order of 60 minutes for flotation.

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Corporate and Social Responsibility Plan



Agriculture

Potential Projects

- Lavender oil extraction
- Aloe vera gel
- Citrus
- Lusam
- Prickly pears
- Mushrooms from underground

Tourism

Potential Projects

- Underground museum
- Mountain biking & trail running
- Camping
- Conservancies

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Corporate and Social Responsibility Plan



		Potential Projects <ul style="list-style-type: none"> Primary health Occupational health Rehabilitation Centre
		Potential Projects <ul style="list-style-type: none"> Retirement Village
		Potential Projects <ul style="list-style-type: none"> Mining services and support Exploration Tailings retreatment UG training centre

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Corporate and Social Responsibility Plan



Current projects gaining momentum:

- Karakul carpet weaving
- Leather products
- Clothing
- Carpentry

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Public Participation

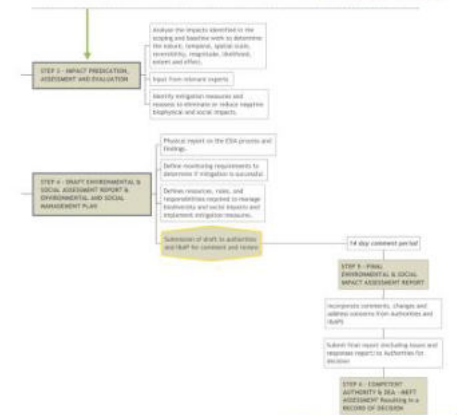


ASPECT	DATE
Notification of the project – newspapers & site notice boards.	Adverts: 21/02/2023 and 28/02/2023 Site Notice: 2 March 2023
The Background Information Document (BID) provided I&APs with the opportunity to take part in the public participation process.	Published on the ECC website 13/01/2023. Direct mail to I&APs 27/02/2023

- ✓ Copies have been made available to the interested and affected parties to assist them with providing informed inputs.
- ✓ This presentation extracts information from the BID to describe the project to those attending the meeting.

Process

- Screening - APP-000785 (DEA PORTAL)
- Scoping – Current Phase
- Assessment Phase
 - Impact prediction and evaluation of alternatives,
 - Assigning mitigation measures
 - Developing monitoring and conceptual rehabilitation plans,
 - This phase culminates in the drafting of the ESIA report and draft Environmental Management Plan (EMP) and
 - Submission to the appropriate competent authorities.



Potential Impacts to be assessed



Potential impacts that can arise from the proposed project include but are not limited to:

- Air Quality
- Blasting & vibration impacts
- Noise impacts
- Visual impacts
- Water resource impacts
- Impact on archaeological and cultural features
- Biodiversity impacts
- Traffic
- Occupational Health and Safety
- Socio-economic impacts



ESIA & ESMP



- All specialist input will be considered and the recommended mitigations will be incorporated into the Environmental & Social Management Plan (ESMP).



Verification and potential updates of existing baseline studies



BASELINE STUDIES	SPECIALIST
Detailed groundwater and surface water	Umvoto
A noise baseline study will be commissioned in Q1 of 2023	Airshed
An air quality baseline study will be commissioned in Q1 of 2023	Airshed
An updated high level socio-economic baseline study will be conducted	ECC
Traffic study	ITS
Visual baseline study	ECC
Blasting and Vibration study	Blast Management



Questions / Discussion ?



SPECIES	ENDEMISM	PROTECTED	IUCN1	IUCN2
<i>Galenia africana</i> L.				
<i>Galenia dregeana</i> Fenzl ex Sond.				
<i>Galenia meziana</i> K.Müll.				
<i>Galenia papulosa</i> (Eckl. & Zeyh.) Sond.				
<i>Galenia pruinosa</i> Sond.				
<i>Tetragonia arbuscula</i> Fenzl				
<i>Tetragonia decumbens</i> Mill.				
<i>Tetragonia reduplicata</i> Welw. ex Oliv.				
<i>Trianthema parvifolia</i> E.Mey. ex Sond. var. <i>parvifolia</i>				
<i>Hermbstaedtia glauca</i> (J.C.Wendl.) Rchb. ex Steud.				
<i>Ozoroa concolor</i> (C.Presl ex Sond.) De Winter	Near endemic			
<i>Rhus populifolia</i> E.Mey. ex Sond.				
<i>Chlorophytum viscosum</i> Kunth				
<i>Searsia populifolia</i> (E.Mey. ex Sond.) Moffett	Near endemic			
<i>Gethyllis namaquensis</i> (Schönland) Oberm.	Near endemic			
<i>Haemanthus pubescens</i> L.f. subsp. <i>arenicola</i> Snijman				
<i>Strumaria hardyana</i> D.Müll.-Doblies & U.Müll.-Doblies	Endemic			
<i>Blepharis furcata</i> (L.f.) Pers.	Near endemic			
<i>Monechma crassiusculum</i> P.G.Mey.	Near endemic			
<i>Monechma mollissimum</i> (Nees) P.G.Mey.				
<i>Pachypodium namaquanum</i> (Wyley ex Harv.) Welw.		Protected	Near threatened	Near threatened
<i>Carissa haematocarpa</i> (Eckl.) A.DC.				
<i>Quaqua acutiloba</i> (N.E.Br.) Bruyns		Protected		
<i>Microloma calycinum</i> E.Mey.	Near endemic			
<i>Stapeliopsis neronis</i> Pillans				Vulnerable
<i>Hoodia gordonii</i> (Masson) Sweet ex Decne.		Protected		Near threatened
<i>Asparagus capensis</i> L. var. <i>capensis</i>				
<i>Asparagus exuvialis</i> Burch. forma <i>exuvialis</i>				

Asparagus graniticus (Oberm.) Fellingham & N.L.Mey.				
Asparagus juniperoides Engl.	Near endemic			
Asparagus retrofractus L.				
Aloe erinacea Hardy	Endemic	Protected	Endangered	Endangerd
Aloe gariensis Pillans	Near endemic	Protected		
Aloe pearsonii Schönland	Near endemic	Protected		Near threatened
Bulbine capitata Poelln.				
Bulbine namaensis Schinz	Near endemic			
Bulbine rhopalophylla Dinter				
Trachyandra bulbinifolia (Dinter) Oberm.				
Trachyandra lanata (Dinter) Oberm.	Endemic			
Trachyandra muricata (L.f.) Kunth				
Asplenium cordatum (Thunb.) Sw.				
Heliophila cornuta Sond. var. squamata (Schltr.) Marais				
Heliophila deserticola Schltr. var. deserticola				
Heliophila eximia Marais				
Heliophila trifurca Burch. ex DC.	Near endemic			
Lepidium africanum (Burm.f.) DC. subsp. divaricatum (Aiton) Jonsell				
Wahlenbergia annularis A.DC.				
Wahlenbergia erophiloides Markgr.	Endemic			Near threatened
Wahlenbergia patula A.DC.				
Wahlenbergia subrosulata Brehmer				
Boscia albitrunca (Burch.) Gilg & Gilg- Ben.		Forestry protected		
Hexacyrtis dickiana Dinter	Near endemic			
Ornithoglossum parviflorum B.Nord. var. parviflorum				
Ornithoglossum vulgare B.Nord.				
Adromischus alstonii (Schönland & Baker f.) C.A.Sm.		Protected		
Adromischus marianiae (Marloth) A.Berger var. kubusensis (Uitewaal) Toelken		Protected		

Adromischus montium-kinghardtii (Dinter) A.Berger		Protected		
Cotyledon orbiculata L. var. orbiculata				
Crassula brevifolia Harv. subsp. brevifolia		Protected		
Crassula campestris (Eckl. & Zeyh.) Endl. ex Walp.		Protected		
Crassula cotyledonis Thunb.		Protected		
Crassula elegans Schönland & Baker f. subsp. elegans	Near endemic	Protected		
Crassula expansa Dryand. subsp. pyrifolia (Compton) Toelken		Protected		
Crassula fusca Herre		Protected		Near threatened
Crassula garibina Marloth & Schönland subsp. garibina		Protected		
Crassula macowaniana Schönland & Baker f.		Protected		Near threatened
Crassula muscosa L. var. muscosa		Protected		
Crassula nemorosa (Eckl. & Zeyh.) Endl. ex Walp.		Protected		
Crassula numaisensis Friedrich	Endemic	Protected		
Crassula oblanceolata Schönland & Baker f.		Protected		
Crassula pseudohemisphaerica Friedrich		Protected		
Crassula rupestris Thunb. subsp. commutata (Friedrich) Toelken		Protected		
Crassula subacaulis Schönland & Baker f. subsp. erosula (N.E.Br.) Toelken		Protected		
Crassula subaphylla (Eckl. & Zeyh.) Harv. var. subaphylla		Protected		
Crassula tenuipedicellata Schönland & Baker f.				
Crassula tomentosa Thunb. var. tomentosa		Protected		
Tylecodon bleckiae G.Will.				
Tylecodon buchholzianus (Schuldt & P.Stephan) Toelken subsp. buchholzianus				
Tylecodon hallii (Toelken) Toelken		Protected		
Tylecodon racemosus (Harv.) Toelken				

Tylecodon reticulatus (L.f.) Toelken subsp. phyllopodium Toelken				
Tylecodon wallichii (Harv.) Toelken subsp. ecklonianus (Harv.) Toelken				
Acanthosicyos horridus Welw. ex Hook.f.	Near endemic	Forestry protected		
Cucumella aspera (Cogn.) C.Jeffrey				
Dioscorea elephantipes (L'Hér) Engl.				
Diospyros ramulosa (E.Mey. ex A.DC.) De Winter				
Euclea asperrima Friedr.-Holzh.	Endemic			Near threatened
Euclea undulata Thunb.				
Clutia thunbergii Sond.				
Euphorbia cibdela N.E.Br.	Near endemic			
Euphorbia dregeana E.Mey. ex Boiss.	Near endemic			
Euphorbia ephedroides E.Mey. ex Boiss. var. ephedroides				
Euphorbia melanohydrata Nel subsp. melanohydrata	Near endemic			
Codon royenii L.				
Ehretia alba Retief & A.E.van Wyk				
Trichodesma africanum (L.) Lehm.				
Cysticapnos vesicaria (L.) Fedde				
Albuca cooperi Baker				
Albuca exuviata Baker				
Albuca longipes Baker				
Albuca setosa Jacq.				
Dipcadi brevifolium (Thunb.) Fourc.				
Drimia elata Jacq.				
Drimia exuviata (Jacq.) Jessop				
Lachenalia buchbergensis Dinter	Near endemic			
Lachenalia giessii W.F.Barker	Endemic			
Lachenalia nordenstamii W.F.Barker				
Namophila urotepala U.Müll.-Doblies & D.Müll.-Doblies	Endemic			
Ornithogalum glandulosum Oberm.	Near endemic			Near threatened

Ornithogalum puberulum Oberm. subsp. puberulum	Endemic			
Ornithogalum stapffii Schinz	Endemic			
Ornithogalum suaveolens Jacq.				
Ornithogalum unifolium Retz. var. unifolium				
Hydnora africana Thunb.				
Pollichia campestris Aiton				
Babiana namaquensis Baker				
Freesia viridis (Aiton) Goldblatt & J.C.Manning				
Lapeirousia barklyi Baker				
Lapeirousia dolomitica Dinter subsp. dolomitica	Near endemic			
Melaspheerula ramosa (L.) N.E.Br.				
Xenoscapa fistulosa (Spreng. ex Klatt) Goldblatt & J.C.Manning				
Ballota africana (L.) Benth.				
Stachys rugosa Aiton				
Kissenia capensis Endl.				
Cyphia dentariifolia C.Presl var. dentariifolia				
Tapinanthus oleifolius (J.C.Wendl.) Danser				
Nymantha capensis (Thunb.) Lindb.				
Melianthus pectinatus Harv. subsp. garipepinus (Merxm. & Roessler) S.A.Tansley				
Antimima quarzitica (Dinter) H.E.K.Hartmann	Endemic	Protected		
Aridaria brevicarpa L.Bolus				
Aridaria noctiflora (L.) Schwantes subsp. straminea (Haw.) Gerbault		Protected		
Aridaria serotina L.Bolus				
Astridia alba (L.Bolus) L.Bolus				
Astridia hallii L.Bolus	Endemic	Protected		
Brownanthus neglectus S.M.Pierce & Gerbault				
Brownanthus pseudoschlichtianus S.M.Pierce & Gerbault				
Cephalophyllum confusum (Dinter) Dinter & Schwantes	Endemic	Protected		
Cephalophyllum herrei L.Bolus		Protected		Near threatened
Cheiridopsis caroli-schmidtii (Dinter & A.Berger) N.E.Br.	Endemic	Protected		

Cheiridopsis robusta (Haw.) N.E.Br.		Protected		
Conophytum pageae (N.E.Br.) N.E.Br.		Protected		
Dracophilus dealbatus (N.E.Br.) Walgate				
Drosanthemum luederitzii (Engl.) Schwantes				
Drosanthemum pauper (Dinter) Dinter & Schwantes	Endemic			
Eberlanzia clausa (Dinter) Schwantes	Endemic	Protected		Near threatened
Eberlanzia cyathiformis (L.Bolus) H.E.K.Hartmann		Protected		
Eberlanzia schneideriana (A.Berger) H.E.K. Hartmann	Near endemic	Protected		
Ebracteola derenbergiana (Dinter) Dinter & Schwantes	Near endemic	Protected		
Hereroa hesperantha (Dinter & A.Berger) Dinter & Schwantes	Near endemic	Protected		
Jordaaniella cuprea (L.Bolus) H.E.K.Hartmann		Protected		
Juttadinteria attenuata Walgate	Near endemic	Protected		
Juttadinteria deserticola (Marloth) Schwantes	Near endemic	Protected		
Leipoldtia weingangiana (Dinter) Dinter & Schwantes subsp. weingangiana	Near endemic			
Mesembryanthemum barklyi N.E.Br.	Near endemic			
Mesembryanthemum pellitum Friedrich				Near threatened
Phyllobolus oculatus (N.E.Br.) Gerbaulet	Near endemic			
Psammophora longifolia L.Bolus	Near endemic	Protected		
Psammophora modesta (Dinter & A.Berger) Dinter & Schwantes	Near endemic	Protected		
Psilocaulon articulatum (Thunb.) N.E.Br.				
Psilocaulon salicornioides (Pax) Schwantes	Near endemic			
Ruschia abbreviata L.Bolus	Near endemic			
Ruschia muelleri (L.Bolus) Schwantes				

Ruschia spinosa (L.) Dehn		Protected		
Ruschia tumidula (Haw.) Schwantes		Protected		
Stoeberia arborea van Jaarsv.		Protected		
Stoeberia beetzii (Dinter) Dinter & Schwantes	Near endemic	Protected		
Stoeberia frutescens (L.Bolus) van Jaarsv.		Protected		
Stoeberia gigas (Dinter) Dinter & Schwantes	Near endemic	Protected		
Hypertelis salsoloides (Burch.) Adamson var. salsoloides				
Limeum aethiopicum Burm.f. var. glabrum Moq.				
Pharnaceum brevicaule (DC.) Bartl.				
Montinia caryophyllacea Thunb.				
Ficus ilicina (Sond.) Miq.				
Grielum humifusum Thunb. var. parviflorum Harv.				
Ophioglossum polyphyllum A.Braun				
Oxalis beneprotecta Dinter ex R. Kunth				
Oxalis copiosa F.Bolus				
Oxalis laxicaulis R.Knuth	Endemic			
Oxalis obtusa Jacq.				
Oxalis pes-caprae L. var. pes-caprae				
Polygala mossii Exell	Near endemic			
Polygala teretifolia L.f.				
Ceraria fruticulosa H.Pearson & Stephens	Near endemic			
Ceraria namaquensis (Sond.) H.Pearson & Stephens	Near endemic			
Cheilanthes capensis (Thunb.) Sw.				
Cheilanthes deltoidea Kunze				
Cheilanthes kunzei Mett.				
Cheilanthes rawsonii (Pappe) Mett. ex Kuhn				
Ehrharta calycina Sm. var. angustifolia Kunth				
Ehrharta delicatula (Nees) Stapf				
Ehrharta triandra Nees ex Trin.				
Eragrostis brizantha Nees				
Fingerhuthia africana Lehm.				

Karoochloa schismoides (Stapf ex Conert) Conert & Türpe				
Leucophrys mesocoma (Nees) Rendle				
Polypogon monspeliensis (L.) Desf.				
Schismus barbatus (Loefl. ex L.) Thell.				
Stipagrostis ciliata (Desf.) De Winter var. capensis (Trin. & Rupr.) De Winter				
Stipagrostis geminifolia Nees	Near endemic			
Stipagrostis obtusa (Delile) Nees				
Anthospermum dregei Sond. subsp. dregei				
Gaillonia crocyllis (Sond.) Thulin				
Galium tomentosum Thunb.				
Kohautia caespitosa Schnizl. subsp. brachyloba (Sond.) D.Mantell				
Gnidia suavissima Dinter				
Didymodoxa capensis (L.f.) Friis & Wilmot-Dear var. capensis				
Forsskaolea candida L.f.				
Chascanum namaquanum (Bolus ex H.Pearson) Moldenke				
Zygophyllum segmentatum Van Zyl				
Sisyndite spartea E.Mey. ex Sond.	Near endemic			
Tribulus cristatus C.Presl				
Zygophyllum applanatum Van Zyl	Endemic			Near threatened
Zygophyllum macrocarpon Retief				
Zygophyllum morgsana L.				Near threatened
Zygophyllum patenticaule Van Zyl				
Thesium lineatum L.f.				
Dodonea angustifolia L.f.				
Pappea capensis Eckl. & Zeyh.				
Aptosimum tragacanthoides E.Mey. ex Benth.				
Diascia ausana Dinter				
Diascia minutiflora Hiern				
Dischisma spicatum (Thunb.) Choisy				

Hebenstretia namaquensis Roessler				
Jamesbrittenia fruticosa (Benth.) Hilliard				
Jamesbrittenia glutinosa (Benth.) Hilliard	Near endemic			
Jamesbrittenia ramosissima (Hiern) Hilliard				
Lyperia tristis (L.f.) Benth.				
Manulea androsacea E.Mey. ex Benth.	Near endemic			
Nemesia violiflora Roessler	Endemic			
Nemesia viscosa E.Mey. ex Benth.	Near endemic			
Peliostomum viscosum E.Mey. ex Benth.				
Phyllopodium namaense (Thell.) Hilliard	Near endemic			
Selago angustibractea Hilliard	Near endemic			
Lycium horridum Thunb.				
Hermannia amoena Dinter ex Friedr.-Holzh.				
Hermannia macra Schltr.				
Hermannia paucifolia Turcz.				
Hermannia stricta (E.Mey. ex Turcz.) Harv.				
Salsola armata C.A.Sm. ex Aellen				
Amellus nanus DC.				
Arctotis fastuosa Jacq.				
Arctotis frutescens Norl.	Endemic			
Berkheya canescens DC.				
Cotula tenella E.Mey. ex DC.				
Dicoma capensis Less.				
Didelta spinosa (L.f.) Aiton				
Eriocephalus ambiguus (DC.) M.A.N.Müll.				
Eriocephalus scariosus DC.	Near endemic			
Euryops namaquensis Schltr.				
Felicia microsperma DC.				
Foveolina dichotoma (DC.) Källersjö				
Gazania lichtensteinii Less.				
Gazania tenuifolia Less.				
Gorteria corymbosa DC.				
Helichrysum alsinoides DC.				

Helichrysum gariepinum DC.	Near endemic			
Helichrysum herniarioides DC.				
Helichrysum obtusum (S.Moore) Moeser				
Hirpicium echinus Less.				
Ifloga molluginoides (DC.) Hilliard				
Kleinia cephalophora Compton				
Kleinia pinguifolia DC.				
Lasiopogon glomerulatus (Harv.) Hilliard				
Lasiospermum brachyglossum DC.				
Nolletia gariepina (DC.) Mattf.				
Oncosiphon grandiflorum (Thunb.) Källersjö				
Oncosiphon suffruticosum (L.) Källersjö				
Osteospermum karrooicum (Bolus) Norl.				
Osteospermum polycephalum (DC.) Norl.				
Osteospermum sinuatum (DC.) Norl. var. sinuatum				
Othonna filicaulis Jacq.				
Othonna lasiocarpa (DC.) Sch.Bip.				
Pegolettia gariepina Anderb.	Near endemic			
Pentzia pinnatisecta Hutch.				
Pteronia lucilioides DC.	Near endemic			
Pteronia paniculata Thunb.				
Pteronia pomonae Merxm.	Endemic			
Senecio arenarius Thunb.				
Senecio cakilefolius DC.				
Senecio corymbiferus DC.				
Senecio flavus (Decne.) Sch.Bip.				
Senecio giessii Merxm.	Near endemic			
Tripteris breviradiata (Norl.) B.Nord.				
Tripteris crassifolia O.Hoffm.				
Tripteris karrooica Bolus				
Tripteris microcarpa Harv. subsp. microcarpa				
Tripteris polycephala DC.	Near endemic			
Tripteris sinuata DC. var. sinuata				

Troglophyton capillaceum (Thunb.) Hilliard & B.L.Burttt subsp. capillaceum				
Troglophyton parvulum (Harv.) Hilliard & B.L.Burttt				
Ursinia nana DC. subsp. nana				
Ursinia speciosa DC.				
Monsonia deserticola Dinter ex R.Knuth	Endemic			
Pelargonium antidysentericum (Eckl. & Zeyh.) Kostel. subsp. antidysentericum				
Pelargonium articulatum (Cav.) Willd.				
Pelargonium grandicalcaratum R.Knuth				
Pelargonium klinghardtense R.Knuth	Near endemic			
Pelargonium paniculatum Jacq.	Near endemic			
Pelargonium spinosum Willd.				
Pelargonium tenuicaule R.Knuth				
Pelargonium vinaceum E.M.Marais				
Pelargonium xerophyton Schltr. ex R.Knuth				
Sarcocaulon crassicaule Rehm				
Sarcocaulon flavescens Rehm				
Sarcocaulon inerme Rehm	Endemic			
Sarcocaulon patersonii (DC.) G.Don	Near endemic			
Indigofera pungens E.Mey.				
Lessertia benguellensis Baker f.				
Lessertia eremicola Dinter	Endemic			Near threatened
Lessertia falciformis DC.				
Lotononis pachycarpa Dinter ex B.-E.van Wyk	Endemic			
Lotononis rabenaviana Dinter & Harms				
Lotononis strigillosa (Merxm. & A.Schreib.) A.Schreib.	Near endemic			
Melolobium candicans (E.Mey.) Eckl. & Zeyh.				
Calobota halenbergensis (Merxm. & Schreib.) Boatwr. & B.-E. van Wyk				

Tylecodon paniculatus (L.f.) Toelken subsp. paniculatus				
Ferraria variabilis Goldblatt & J.C.Manning	Endemic			
Spiloxene etesionamibensis U.Müll.- Doblies, Mark.Ackermann, Weigend & D.Müll.-Doblies	Endemic			
Crotalaria giessii M.M.le Roux & B- E.Van Wyk	Endemic			
Gorteria parviligulata (Roessler) Stangb. & Anderb.				
Crassothonna cylindrica (Lam.) B.Nord.				
Crassothonna opima (Merxm.) B.Nord.	Near endemic			
Crassothonna protecta (Dinter) B.Nord.				
Desertia luteovirens Mart.-Azorín, M.Pinter & Wetschnig	Near endemic			
Aloidendron ramosissimum (Pillans) Klopper & Gideon F.Sm.	Near endemic	Protected	Vulnerable	
Aloidendron pillansii (L.Guthrie) Klopper & Gideon F.Sm.	Near endemic	Protected	Critically Endangered	Endangered
Crassothonna sparsiflora (S.Moore) B.Nord.	Near endemic			
Roepera cordifolia (L.f.) Beier & Thulin				
Roepera leptopetala (Sond.) Beier & Thulin				Near threatened
Tetraena applanata (Van Zyl) Beier & Thulin	Endemic			Near threatened
Tetraena longicapsularis (Schinz) Beier & Thulin	Near endemic			
Tetraena microcarpa (Licht. ex Cham.) Beier & Thulin	Near endemic			
Tetraena prismatocarpa (Sond.) Beier & Thulin				
Tetraena retrofracta (Thunb.) Beier & Thulin				
Arctotis namibiensis R.J.McKenzie & Mannheimer				
Roepera schreiberi (Merxm. & Giess) Beier & Thulin	Endemic			

Name of Consultant: Jessica Bezuidenhout
Position / Profession: Environmental Specialist
Date of Birth: 24 October 1984
Nationality: Australian – Namibian Domicile, mother of a Namibian child.
Email: jessica@eccenvironmental.com
Website: www.eccenvironmental.com
Contact: +264 81 653 1214

TERTIARY EDUCATION:

Federation University Australia: 2003 – 2006 Bachelor of Applied Science – Environmental Management

OTHER TRAINING:

- Management Systems Leadership
- ICAM – Incident Causes Analysis Method
- Certificate II in Metalliferous Mining Core Safety and Risk Management
- Certificate III in Mine Emergency Response & Rescue
- Level 3 – HLTFA402B Apply Advance First Aid Emergency Rope Rescue
- Level 2 – 21593VIC First Aid Level 2 Bonded Asbestos Removal > 10m²
- Leading and Managing People – Brisbane North Institute of TAFE

Professional Associations:

- Chamber of Mines Namibia
- Women on Boards
- The Chamber of Minerals and Energy of Western Australia Industry Member – Mining, Minerals and Resources
- Environmental Assessment Professional Association of Namibia (EAPAN)

PROFILE:

Jessica works as a Lead Environmental Practitioner with a diverse environmental background. Mrs Bezuidenhout has leading practical experience in fields of construction, exploration, monitoring and audit compliance, consultancy, operations, water treatment and wastewater treatment plants, environmental approvals, legal, minimising operational impacts, community liaison, including indigenous relationship management, mine closure and rehabilitation.

KEY AREAS OF EXPERTISE:

Environmental Management	-	Project Management
Environmental (and social) Impact Assessments (EIAs)	-	Conducting and managing various small to large scale EIAs Compiling EIA Reports and EMPs Coordinate and review specialist studies
Environmental & Social Compliance reporting	-	Environmental and Social compliance audits in the construction and mining industry



LANGUAGES:

English	Read Excellent	Write Excellent	Speak Excellent
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SUMMARY OF EXPERIENCE AND CAPABILITY:

Jessica has 15 years of mining and construction experience in the SHEQ field, with 7 years of that being in Australia and 8 years in Namibia and Southern Africa. Her first three years were as an Environmental Systems Coordinator where she obtained regulatory approvals, oversaw operational budgets and bond management for mine closures, oversaw compliance and ensured environmental and social aspects of international management codes were adhered to. The following 3 years she worked in the environmental management field as a Site Environmental Manager managing various projects and bringing sites into full compliance with environmental legislative frameworks, while also being responsible for the environment, sustainability, and social reporting portfolio. She then went on to work as an Environmental Consultant where she was responsible for mine closure and rehabilitation and sustainability reporting. Since 2016 Jessica has been a Managing Director of Environmental Compliance Consultancy (ECC) spearheading many environmental impact assessments undertaken in Southern Africa, advising clients and has thus gained great practical experience and knowledge on local and international compliance and auditing standards such as IFC and the World Bank.

PROJECT EXPERIENCE

PROJECT	DATE	ROLE
Contracted services by The Australian Defence Force (ADF) for Environmental Management of Defence projects.	2006 – 2007	Environmental Project Manager
Site environmental officer and systems coordinator, Ballarat Goldfields.	2007 – 2010	Environmental Systems Coordinator
Managed the environmental and community aspects of three operations: Savannah Nickel Mine, Copernicus Nickel Mine (currently in care and maintenance) and the operations at Wyndham Port	2010-2013	Site Environmental Manager
A mine closure project taking an operating mine site into the rehabilitation and closure phase. This project involved the full development of a mine closure plan, facilitation of the government	2013-2014	Environmental Consultant

approvals, stakeholder engagement and technical environmental studies to inform the mine closure plan		
Full scale construction of new greenfield mine into an operational copper mine - Tschudi	2013-2016	HSE Manager
HSE management of operational underground mines, Otjihase and Matchless	2013-2016	HSE Manager
Director Environmental Compliance Consultancy	2016 – Current	Director and principle environmental practitioner
Projects completed while at ECC		
The Environmental Impact Assessment (EIA) for the proposed Walvis Bay Waterfront development	2018	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Conduct the Namibian assessment on the laws and policies relating to six thematic areas based on a compendium of best practices for governments to best deal with the full range of issues related to mining.	2018	Lead Environmental Assessment Practitioner
ESIA amendment for B2Gold Namibia Mining Licence (ML 169) to developed underground mine working for the Otjikoto Gold Mine	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Kunene Regional Counsel Sustainable water supply Pipeline and Ancillary works	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
ESIA application for B2Gold Namibia 10.8 megawatt PV solar upgrade to the B2Gold Power Plant	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
EIA application for sand removal on Farm Okakongo Nord No. 58	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
EIA application for Uris irrigation scheme	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
MAWF permit application for Water Abstraction and Discharge for Uris Irrigation scheme	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
EIA application for University of Namibia (UNAM) Katima Mulilo Campus Expansion	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
EIA application for B2Gold exploration activities EPL 6627 & EPL 6628	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and

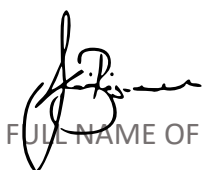
		PPP and report review)
ESIA application for farm Tsumore 761 Unit B Irrigation Project	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
MAWF permit application for Water Abstraction and Discharge for Tsumore 761 Unit B Irrigation Project	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
ESIA application for Otjiwarongo Wastewater Treatment and Bulk Water Supply	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
ESIA for the Wastewater Treatment facilities for Gondwanan Collection	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
MAWF permit application for Water Abstraction and Discharge for Gondwanan Collection	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Conduct an environmental assessment in order to complete an Environmental Impact Assessment and Environmental Management Plan (EMP) for Marenica Energy.	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Appointed Environmental Practitioner for the B2Gold exploration activities on EPL 6949. Conduct an environmental assessment in order to complete an Environmental Impact Assessment and Environmental Management Plan (EMP)	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by Marenica Energy to undertake an Environmental Impact Assessment (EIA) and an Environmental Management Plan (EMP) for EPL's 6663, 7435, 7436, 7278 & 7279 for Nuclear Fuel Minerals	2019	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by Marenica Energy to undertake an Environmental Impact Assessment (EIA) and an Environmental Management Plan (EMP) on EPL's : 7703, 7340, 7303 & 7172 for Base and Rare Metals, Industrial Minerals, Precious Metals and Semi-Precious Stones.	2020	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by Mertens Mining and Trading (Pty) Ltd, to undertake an Environmental Impact Assessment (EIA) and an Environmental Management Plan (EMP) to undertake bulk sampling, exploration activities and trial processing on EPL 7699.	2020	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by Kuiseb Copper Company (Pty) (Ltd) to undertake an ESIA and an Environmental	2020	Lead Environmental Assessment Practitioner managing the EIA process

Management Plan (EMP) for EPLs: 7528, 7529, 7530, 7531, 7532, 7533, 7534, 7535, 7536, 7537, 7538, 7539, 7540, 7541, 7542, 7543, 7730, 7731, 7732,		(including stakeholder engagement and PPP and report review)
Exploration by Cheetah Minerals	2020	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by Skorpion Zinc (Namzinc) (Pty) (Ltd) to undertake an ESIA and an Environmental Management Plan (EMP)	2021	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by Afritin Mining Namibia (Pty) Ltd to undertake the ESIA and Environmental Management Plan (EMP)	2021	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Project Wings - engaged by Headspring Investments (Pty) Ltd to undertake the Environmental, Social and Impact Assessment and Environmental Management Plan	2021	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Application for an Environmental Clearance Certificate for Twin Hills Gold Project	2021	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by Votorantim Metals Namibia (Pty) Ltd to undertake the ESIA and Environmental Management Plan (EMP) for exploration activities on EPL 8127	2021	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)
Engaged by to undertake an ESIA and an Environmental Management Plan (EMP) for the stage 2 expansion of the pilot tin processing plant on Mining Licence (ML) 134, held by Uis Tin Mining Company	2021	Lead Environmental Assessment Practitioner managing the EIA process (including stakeholder engagement and PPP and report review)

CERTIFICATION:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and experience.

DATE: 10/ 11 / 20



FULL NAME OF CONSULTANT: JESSICA BEZUIDENHOUT

Name of Consultant: Monique Jarrett
 Position / Profession: Environmental Practitioner
 Date of Birth: 25 March 1997
 Nationality: Namibian
 Professional Memberships: EAPAN No. 234
 Email: monique@eccenvironmental.com
 Website: www.eccenvironmental.com
 Contact: +264 81 3811 474

QUALIFICATIONS:

University of Namibia: 2016 – 2020 Bachelor of Science (Honours) in Environmental Biology

PROFESSIONAL ASSOCIATIONS:

- Environmental Assessment Professionals Association of Namibia (EAPAN)

PROFILE:

As a holder of a BSc (Hons) in Environmental Biology from the University of Namibia, Monique is passionate about conservation, sustainability, climate change and environmental management by contributing to effective environmental management systems. She has acquired a variety of skills assisting with various ESIA, environmental monitoring and compliance projects as a junior environmental practitioner.

KEY AREAS OF EXPERTISE:

Environmental (and social) Impact Assessments (EIAs) (ESIAs)	-	Compiling EIA Reports and EMPs Public Participation & Stakeholder Management
Environmental Management	-	Environmental Management Systems (EMS), Tenement management, Environmental monitoring and compliance, and Public Participation & Stakeholder Engagement.

LANGUAGES:

English	Read Excellent	Write Excellent	Speak Excellent
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SUMMARY OF EXPERIENCE AND CAPABILITY:

Since 2016 Monique has been working in the environmental industry. Monique has written a variety of articles on environmental and sustainability topics analysing current international and national environmental matters. Monique started gaining experience in compliance monitoring while working on the support to Community Based Natural Resource Management (CBNRM) project with GIZ. Monique gained extensive experience in environmental awareness as a climate change ambassador for Gobabeb in 2021. Monique joined the ECC team in 2021 where she has been actively involved in the ESIA process and monitoring/EMP compliance for clients.

PROJECT EXPERIENCE

PROJECT	DATE	ROLE
GIZ - Support to CBNRM Compliance monitoring	2018	Intern
UNDP/Gobabeb - Climate Action for Millennials Programme	2021	Climate Ambassador
Elevate Uranium Tenement management	Present	Junior environmental practitioner
Headspring Environmental Compliance and Monitoring	2022	Junior environmental practitioner
Craton Environmental Compliance and Monitoring	2022	Junior environmental practitioner
B2Gold Environmental Compliance and Monitoring	2022	Junior environmental practitioner
Votorantim Environmental Compliance and Monitoring	2022	Junior environmental practitioner
Namibian Marine Phosphate – Sandpiper Marine Phosphate Project ESIA	2022	Junior environmental practitioner
Votorantim Metals Namibia EPL 8403 ESIA	2022	Junior environmental practitioner
B2Gold Namibia Minerals EPL 8404 ESIA	2022	Junior environmental practitioner
Skorpion Mining Company EPL 8570 ESIA	2022	Junior environmental practitioner
Skorpion Mining Company EPLs 8571, 8572 & 8573	2022	Junior environmental practitioner
Votorantim Metals Namibia EPLs 7963, 7973, 8050, 8051	2023	Environmental practitioner

CERTIFICATION:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and my experience.

DATE: 21/04/2023



Monique Jarrett