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REPORT:

NAVACHAB GOLD MINE – OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

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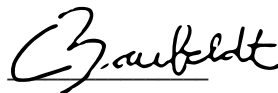
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ABBREVIATIONS

Abbreviations	Description
%	percentage
AN	anomaly 16 pit
ASTM D1739-98	American Society for Testing and Materials Standard (D1739-98)
AQG	air quality guidelines
BH	borehole
BOD	biological oxygen demand
C5	channel 5
CIP	carbon in pulp
CN	cyanide
COD	chemical oxygen demand
COx	carbon oxides
CSI	corporate social investment
dB	decibel
DO	dissolved oxygen
DWA	Department of Water Affairs
EC	European Community
ECC	Environmental Compliance Consultancy
ECC	environmental clearance certificate
e.g.	example
EMA	Environmental Management Act
EMP	environmental management plan
EPL	exclusive prospecting licence
ESIA	environmental and social impact assessment
FOG	fats, oils and greases
g	gram
GHG	greenhouse gas emissions
GIS	geographic information system
h	hour
HDPE	high density poly ethylene
HF	hydrogen fluoride
HME	heavy mobile equipment
HSE	health, safety and environment
I&APs	interested and affected parties
ISO	International Organisation for Standardization

Abbreviations	Description
IT-3	interim target 3 (WHO target)
KPI	key performance indicators
km	kilometre
km ²	kilometre squared
LDV	light duty vehicle
LED	light-emitting diode
KMCC	Karibib Mining and Construction Company
MEFT	Ministry of Environment, Forestry and Tourism
mg/l	milligram per litre
mg/m ² /day	milligram per meter squared per day
ML	mining licence
m ³ /day	metre cubed per day
m	metre
m ³	metre cubed
mm	millimetre
m/s	metre per second
mm/s	millimetre per second
MIME	Ministry of Industries, Mines and Energy
MHoSS	Ministry of Health and Social Services
ms/m	millisiemens per metre
MSDS	material data safety sheet
Navachab	QKR Navachab Gold Mine
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NTU	turbidimetric turbidity unit
OEM	original equipment manufacturer
OEMP	operational environmental management plan
OHSE	operational, health, safety and environmental
PCP	pre-concentrator plant
pH	potential hydrogen
ppm	parts per million
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter of less than 10 µm
PM _{2.5}	particulate matter with an aerodynamic diameter of less than 2.5 µm
PPE	personal protective equipment

Abbreviations	Description
PV	photovoltaic
QRS	identification used for archaeological sites
ROM	run of mine
SA	South African
SANS	South African National Standard
SHE	safety, health and environment
SOP	standard operating procedure
SO₂	sulphur dioxide
SO_x	sulphur oxides
SWMP	surface water management plan
TSM	technical services manager
ToR	terms of reference
TSF	tailings storage facility
TSP	total suspended particle, generally accepted as aerosols <30 micron diameter
VOCs	volatile organic compounds
WAD CN	weak acid dissociable cyanide
WHO	World Health Organization
WRD	waste rock dump
WW	DWA issued registered borehole number abbreviation
µg/l	microgram per litre
µg/m³	microgram per meter cubed

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Environmental Compliance Consultancy (ECC) has been engaged by QKR Navachab Gold Mine (Navachab) to update the consolidated operational environmental management plan (OEMP) for activities on mining licence (ML) 31, ML 180, the accessory works area in ML 31, exclusive prospecting licence (EPL) 999 and EPL 3275.

Navachab is located near the town of Karibib in Namibia. Karibib is situated approximately 170 kilometre (km) northwest of Windhoek, the capital of Namibia (Figure 1). Navachab, mainly an open cast operation, started production in 1989. The mine was wholly owned by AngloGold Ashanti Namibia up to 30 June 2014 when shareholding was transferred to QKR and Epangelo Mining. Underground mining activities commenced in the main pit in 2021.

From inception, mining was done by a contractor, Karibib Mining and Construction Company (KMCC) (Pty) Ltd, and went to owner-mining in January 2004. A mining contractor, Lewcor, did the bulk of the mining operations between 2011 and 2017. As from 2018 Anomaly 16 (AN16) was being mined by a contractor, EVS Mining Contractors (Pty) Ltd, while the main pit and Gecko satellite operations are owner mined.

Navachab have two active EPLs, whereby active fieldwork in the form of soil sampling, geophysical sampling and drilling activities are conducted on a regular basis.

In December 2022 the Ministry of Environment, Forestry and Tourism approved the consolidation of existing environmental clearance certificates (ECC) for ML 31 and the accessory works area in ML 31 as a standalone ECC for ML 31. The OEMP as revision 1 was in support of that application.

Subsequent to this, Navachab conducted an environmental and social impact assessment (ESIA) for the addition of a tailing storage facility (TSF 3), establishment of an additional raw water storage dam and expansion of co-disposal facilities to active waste rock dumps, that falls under the ECC for ML 31. A stand-alone environmental clearance certificate was issued on 20 March 2024 for these listed activities. Additionally, in November 2025, an amendment to the 2020 (ECC) scoping report (with impact assessment) for the underground mining activities was conducted. These updates reflect in this revision of the OEMP.

Additional Project updates have followed and therefore this operational environmental management plan has been updated to a revision 02 to reflect these changes and/or additions.

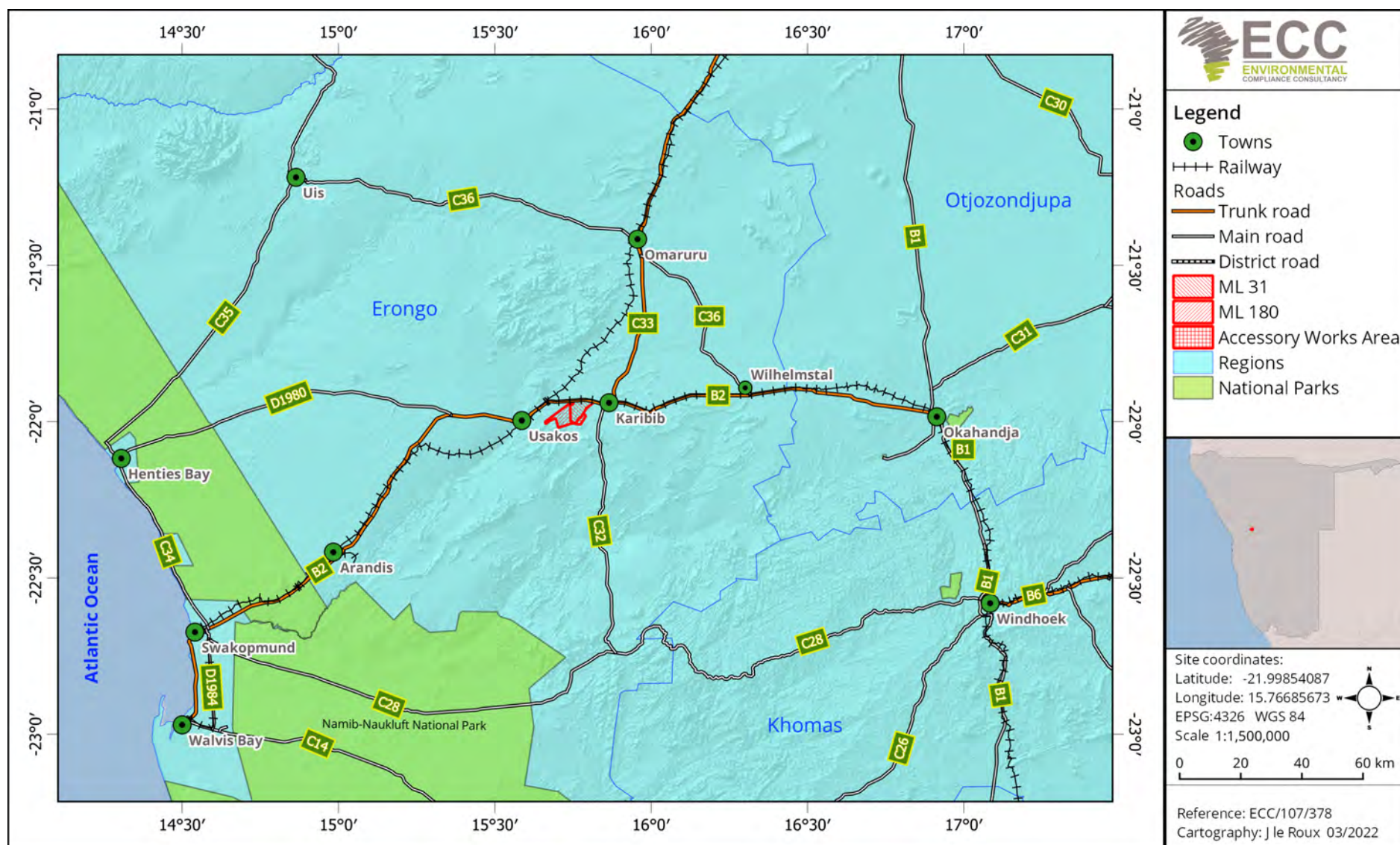


Figure 1 - Locality map showing the location of Navachab Gold Mine

1.2 ENVIRONMENTAL REGULATORY REQUIREMENTS

The Project is considered as a listed activity as stipulated in the Environmental Management Act, No. 7 of 2007 and its Regulations, promulgated in 2012. A valid environmental management plan (EMP) is required in order to manage environmental aspects and impacts during operational activities.

This report presents the OEMP and has been undertaken in terms of the requirements of the Environmental Management Act, No. 7 of 2007 and its 2012 Regulations.

1.3 PURPOSE AND SCOPE OF THIS REPORT

The operational environmental management plan (hereafter referred to as the OEMP) provides a logical framework, mitigation measures and management strategies for the mining and exploration activities associated with the Project. This ensures 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 and defined in the OEMP are the protocols, procedures and roles and responsibilities to ensure that management requirements are effectively and appropriately implemented.

This OEMP 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, when further data or information is added or when there are legislative updates. All personnel working on the Project will be legally required to comply with the requirements set out in the final OEMP that is approved by the competent authorities and Ministry of Environment, Forestry and Tourism (MEFT).

The scope of this OEMP includes all activities associated with mining and exploration related activities on Navachab Gold Mine. The purpose of this OEMP is to support activities on ML 31, ML 31 accessory works area, ML 180, EPL 999 and EPL 3275. This OEMP has been updated to reflect revision 02. Additions made to the OEMP include the following areas:

- Exploration domain;
- TSF 3 approval which includes - co-disposal on all waste rock dumps, additional water storage pond and power line associated infrastructure amendments;
- Monitoring programme updates;
- Stormwater management updates;
- Climate change requirement updates;
- Legislative changes and licence changes;
- Processing plant related updates – includes an interlock bricking manufacturing plant and a new gravity gold concentration plant;
- Expansion of underground mining activities;
- Addition of a third explosives magazinr;
- Proposed future solar power plant; and
- Rehabilitation requirements.

Figure 2 provides a current overview of issued and valid environmental clearance certificates per ML 31, ML 180, accessory works area for ML 31, EPL 999 and EPL 3275.



Figure 2 - Navachab Gold Mine environmental clearance certificates per ML 31, ML 180, accessory works area in ML 31, EPL 999 and EPL 3275

1.4 MANAGEMENT OF THIS OEMP

The Proponent, Navachab, holds the valid environmental clearance certificates for the activities on ML 31, ML 180, the accessory works area in ML 31, EPL 999 and EPL 3275 and is responsible for the implementation and management of this OEMP. The implementation and management of this OEMP and the monitoring of compliance, will be undertaken through daily duties and activities, as well as defined monthly, quarterly and annual or other periodic inspections and/or monitoring surveys.

1.5 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS RELATED TO THIS OEMP

This OEMP does not include measures for compliance with statutory occupational health and safety requirements. This is managed by the Proponent's Occupational Health and Safety Plan, which is compliant with ISO 45001 standards and therefore not in the scope of this OEMP.

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

The information contained in this OEMP has been based on the current valid environmental clearance certificates and associated management plans for ML 31, ML 180, associated accessory works area in ML 31, EPL 999 and EPL 3275, as of November 2025. If and where mining and/or exploration requirements are changed, this OEMP may require updating and/or potential further assessment to 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 OEMP'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.

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2 ENVIRONMENTAL MANAGEMENT FRAMEWORK

This OEMP provides measures, guidelines and procedures for managing and mitigating potential environmental impacts. The OEMP also indicates monitoring and reporting guidelines and sets responsibilities for those carrying out management and mitigation measures. The specific management plans for the OEMP have been divided into domains, which are listed as below:

- Domain 1: Linear infrastructure (surface roads, access roads, power lines)
- Domain 2: General and administration services (administration offices, security and emergency services, general parking and sewage systems)
- Domain 3: Open pits (main pit, gecko satellite pit, anomaly 16 satellite pit, Grid A pit, steenbok satellite pit)
- Domain 4: Underground mining
- Domain 5: Tailings storage facilities (TSF 1, 2 and 3)
- Domain 6: Stockpiles (waste rock, ore)
- Domain 7: Processing plant (Argo plant, PCP plant, CIP plant and associated infrastructure)
- Domain 8: Workshops and laydown areas (HME, engineering, processing, contractors, explosives magazines)
- Domain 9: Non-mineralised waste facility and bioremediation site
- Domain 10: Fuel depot and wash bays
- Domain 11: Navachab farm and nursery
- Domain 12: Topsoil stockpiles
- Domain 13: Exploration (EPL 999 and EPL 3275)
- Domain 14: Solar PV plant

Through defining these domains, clear operating areas are established. Within each domain, a domain manager is assigned and is responsible and accountable for the management of the environment within the domain and who shall ensure that the domain schedule is reviewed to ensure no additional environmental impacts occur. The technical services manager (TSM) oversees the operational, health, safety and environmental (OHSE) department and shall ensure that all measures are implemented to mitigate and manage environmental impacts; e.g. ensuring pollution control measures, and that monitoring and reporting associated with the domain are in place.

2.1 OBJECTIVES AND TARGETS

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

Environmental objectives for Navachab are as follows:

- Zero pollution incidents;
- Minimal vegetation clearing and earthworks;
- Minimal impact on regional groundwater users;
- Protect local flora and fauna;
- Progressive rehabilitation across all domains with commencement as early as possible in the mining and exploration life cycles; and

- Use natural resources effectively and efficiently.

Additionally in 2024, Navachab underwent a climate change analysis and assessment to quantify their greenhouse gas emissions (scope 1, scope 2, and scope 3). Recommendations from this report are as follows to reduce the different scope emissions for operational and exploration activities:

- **Short-term (Year 0 - 2)**

- Alternative energy sources: consider immediate adoption of renewable energy sources such as solar power for on-site energy generation.
- Energy efficiency improvements: implement energy efficiency measures in mining processes and equipment. Implement energy-efficient technologies, such as light-emitting diode (LED) lighting and variable frequency drives, to reduce electricity consumption.
- Waste reduction: minimise waste through better ore selection and processing techniques. Reducing waste can lead to decreased energy consumption and emissions.
- Vehicle transition – testing phase: transition mining vehicle fleets from diesel powered to electric powered vehicles, which have lower carbon emissions. Thus, optimise logistics and replace other diesel-powered vehicles with electric or hybrid alternatives for short-distance transportation within the mine site. For mine trucks, this can be a “testing phase” while for light duty vehicles (LDV’s), this can be a concerted step change.
- Create data classification points: this will involve classifying operational assets into groupings that allow for identification of emission “hotspots” and emission reduction opportunities.
- Community engagement: collaborate with local communities and stakeholders to develop long-term sustainable mining practices that align with environmental and social goals, thus minimising the overall impact of mining.

- **Medium-term (Year 2 - 5)**

- Vehicle fleet transition: transition mining vehicle fleets from diesel-powered to electric vehicles, which have lower carbon emissions.
- Supply chain assessment: conduct a comprehensive assessment of the green house gas emissions associated with the entire supply chain, identifying areas for optimisation and emission reduction.
- Carbon neutrality commitment: set a long-term goal of achieving carbon neutrality and invest in projects to offset emissions through carbon credit programs.

- **Long-term (Year 5 and beyond)**

- Vehicle transition: transition mining vehicle fleet from diesel-powered to electric powered vehicles noting by then there is a possibility to incorporate hydrogen powered haulers. It is anticipated that learnings from the medium term would now be better understood and possibly entrenched in the business culture.

- **Further actions**

- Establish ongoing surveillance of existing databases to promptly detect and integrate any updates or modifications.

- Continue to research sources for emission factors and incorporate them into future reporting.
- Foster proactive collaboration with others to collectively centralised emission factors to support the entire mining value chain. A key starting point would be the Namibian Chamber of Mines.

2.2 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

Navachab will provide a competent team to oversee and undertake exploration, mining and operational activities, which is composed of Navachab's personnel and contractors. The QKR Navachab Gold Mine's technical services manager will ensure the management and implementation of this OEMP is carried out throughout the life of mine.

The Proponent shall be responsible for:

- Ensuring all members of the operational team, including contractors, comply with the procedures set out in this OEMP;
- 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; and
- Contractors shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this OEMP 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
Navachab Gold Mine	– Responsible for the overall management and implementation of the OEMP. – Ensure environmental policies are drafted/updated and communicated to all personnel throughout the company and contractors. – Responsible for providing the resources required to effectively run the mine and comply with the OEMP. – Appoint all managers needed to ensure effective running of the mine and exploration operations. – Ensure systems for proper induction and training of personnel and contractors are in place.
QKR Namibia management	– Manage all activities on the mine. – Monitor daily operations and ensure systems are in place for implementation of the OEMP. – Maintain the community issues and concerns register and keep records of complaints. – Ensure corrective action are taken and communicated to complainants.

Role	Responsibilities and duties
	– Maintain up to date records of employees who have completed training and induction.
Mining director	– Ensure that all contract workers, sub-contractors and visitors to the site are aware of the requirements of this OEMP, relevant to their roles and always adhere to this OEMP. – Report any non-compliance or accidents. – Receive, record and respond to complaints. – Ensure adequate resources are available for the implementation of the OEMP. – Ensure safe and environmentally sound operations. – Responsible for the management, maintenance and revisions of this OEMP.
Technical services manager	– Maintain the mine's EMS. – Draft and update mine specific environmental procedures. – Ensure mine site induction training is relevant and address issues from this OEMP. – 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.
Environmental officer(s)	– Conduct environmental monitoring, audits and inspections. – Compile draft environmental reports.
Employees	– Adhere to measures set out in the OEMP. – Ensure they have undertaken a site induction. – Report any operations or conditions which deviate from the OEMP, as well as any non-compliant issues or accidents to the TSM.

2.3 CONTRACTORS

Any contractors hired during the mining and exploration operational activities for the life of mine shall be compliant with this OEMP and shall be responsible for the following:

- Undertaking activities in accordance with this OEMP 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 impacts, to the TSM and/or environmental section/officer(s); and
- Ensuring appropriate corrective or remedial action is taken to address all environmental impacts and incidents reported by employees and subcontractors.

2.4 EMPLOYMENT

QKR Namibia Gold Mine 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;
- The Proponent shall ensure that skills transfer is affected toward the local employee base for the duration of the Project; and
- Every effort shall be made to recruit from the group of unemployed workers living in the surrounding area.

2.5 DOMAIN 1: LINEAR INFRASTRUCTURE

This domain includes tasks for linear infrastructure and activities, which are mapped below (where possible):

- Access roads;
- Surface roads; and
- Powerlines and sub-station.

Updates to this domain includes the extension of existing power lines to the barge and pump currently operating in TSF 2 that forms part of the construction phase for TSF 3, power infrastructure required for the reload crusher operations, brick manufacturing plant, new gold gravity feed plant and new raw water storage pond.

The overall domain manager is the operational mining manager.

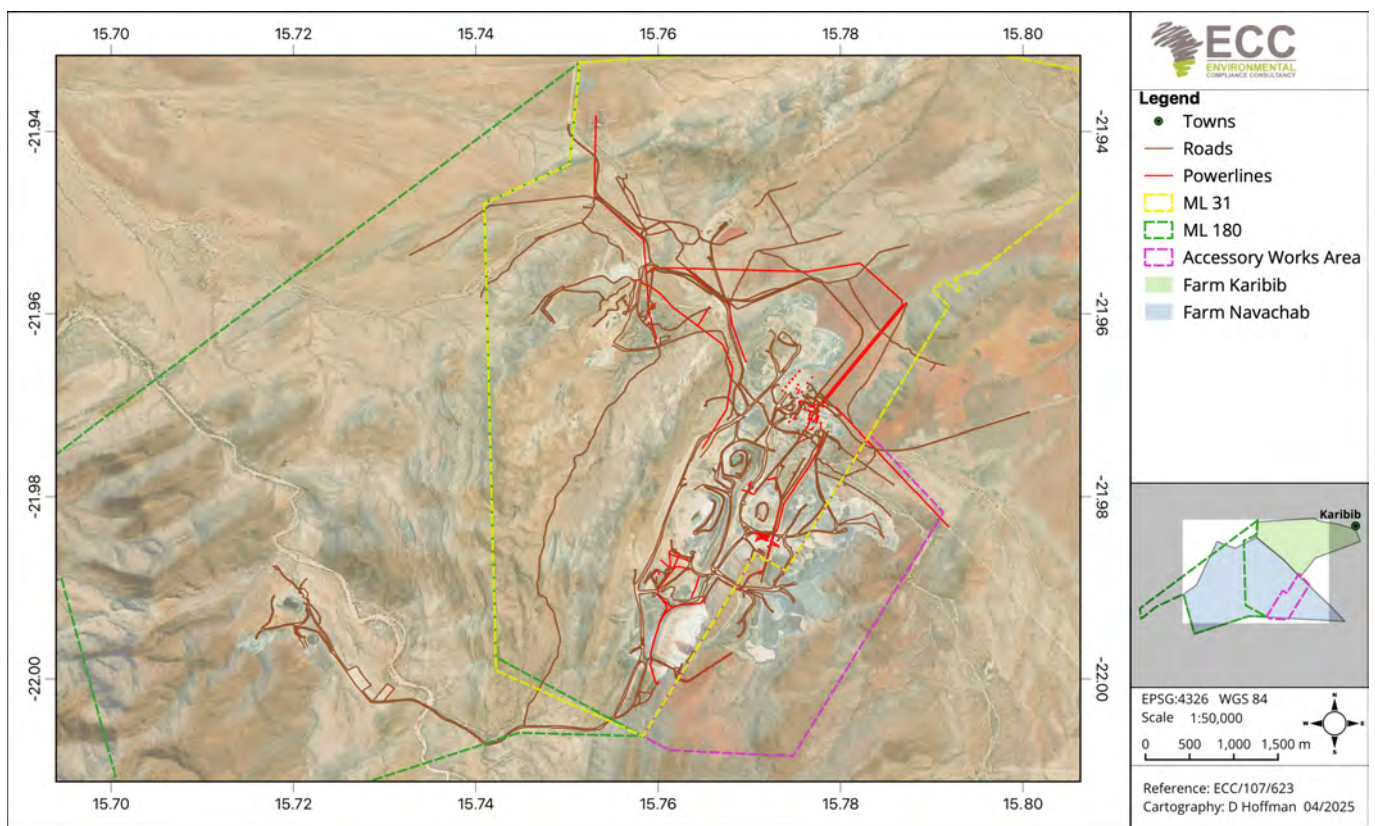


Figure 3 - Domain 1 map depicting linear infrastructure

Table 2 – Environmental management plan for Domain 1; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Air quality	Dust generated from unpaved roads - potential impacts on staff, third parties and the surrounding environment	– Dust suppression measures to be implemented through the use of water sprays or chemical binding agents; – A fall out dust (TSP) monitoring network is established around the mine to monitor the effects of fall out dust from operations; – Fall out dust units to be exchanged every 28-32 days and results reported monthly to management; – Where results from the monitoring campaign warrant it, consider paving roads; – Dust masks to be issued for dusty areas on the mine; – Roads to be maintained on a regular basis, weekly, where these surfaces are very active and prone to corrugation; – Trucks carrying loads should be covered, where possible; and – Complaints register to be maintained if third party complaints received.	– Environmental audits and inspections – Air quality monitoring programme – monthly – Complaints register – Biodiversity monitoring programme	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Noise	Noise impacts on employees	- Occupational noise monitoring campaigns to be conducted on an annual basis by the OHSE department; - Employees to be issued with ear protection, where required; - Pre-start checks to be conducted daily on vehicles and equipment; and - Equipment, vehicles and heavy mobile equipment (HME) to be serviced and maintained on a regular basis by Navachab staff, visitors and contractors.	- Environmental audits and inspections - Occupational noise monitoring programme - Workshop pre-start checklists - Workshop maintenance records	- Operational mining manager - Technical services manager
	Noise impacts on third parties	- Complaints register to be maintained if third party complaints received; - Pre-start checks to be conducted daily on vehicles and equipment; and - Equipment, vehicles and HME to be serviced and maintained on a regular basis by Navachab staff, visitors and contractors.	- Environmental audits and inspections - Workshop pre-start checklists - Workshop maintenance records - Complaints register	Operational mining manager
Biodiversity	Injuries or mortalities to	Drivers to have valid national and site	Environmental audits and inspections	Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	biodiversity from road users	specific drivers licenses; – Drivers to adhere to speed limits; – Drivers to drive to the conditions of the road; – Animals have right of way; – Incidents involving wildlife and staff, visitors and/or contractors to be immediately reported to the OHSE department; and – All incidents to be investigated and recorded as per the incident management procedure.	– Incident records	– Technical services manager
	Injuries or mortalities to avifauna from power line infrastructure	– Regular monitoring surveys to be conducted on power lines infrastructure, where required. This is recommended to be monthly for new structures and quarterly from there on; – Suitable deterrent measures to be investigated with the assistance of a qualified high voltage electrician where there are repeat collision or electrocution events;	– Environmental audits and inspections – Biodiversity monitoring programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Stay wires to be appropriately marked; and – If high voltage power line infrastructure is property of NamPower on the mine site, annual inductions to be arranged and NamPower to be informed of planned surveys.		
Water management	Pooling/standing water from a lack of stormwater controls or inadequately designed road surface resulting in erosion of surfaces, safety concerns and attracting wildlife to work areas	– Stormwater management plan to be updated and implemented; – Road surfaces to be maintained on a regular basis; and – Diversions to be constructed in road surfaces where water is prone to pool to be released into the natural environment, except in the case of contact water, whereby this should either be allowed to evaporate or pumped for reuse where feasible.	– Environmental audits and inspections – Maintenance schedules	– Operational mining manager
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure	– Develop a rehabilitation plan and implement the requirements stipulated therein; – Re-vegetation to be conducted through direct seeding and	– Mine closure plan and closure schedules – Rehabilitation monitoring based on	– Operational mining manager – Technical services manager

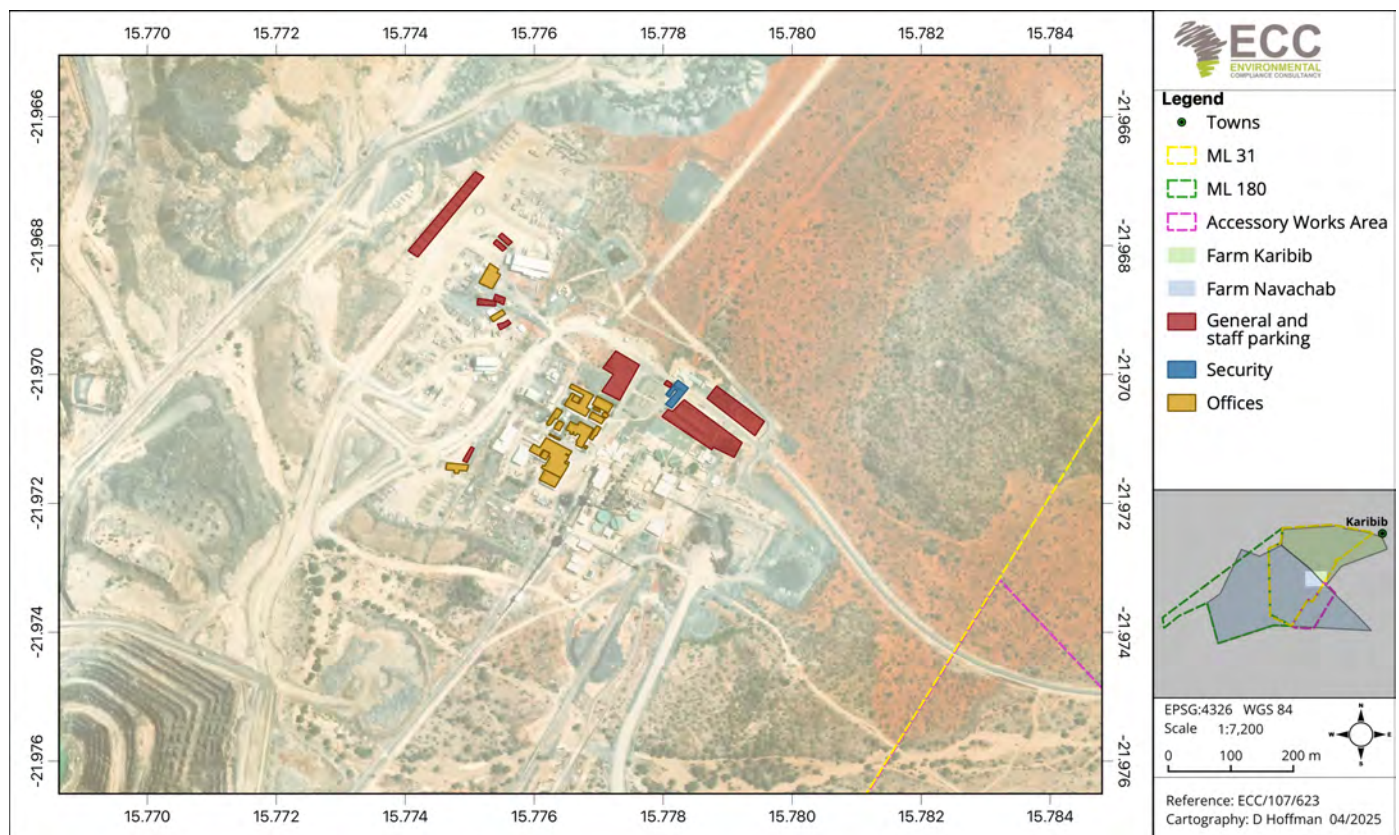
Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	A lack of progressive rehabilitation and failure to revegetate the landforms	- tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; - Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and - Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required.	rehabilitation plan	

2.6 DOMAIN 2: GENERAL AND ADMINISTRATION SERVICES

This domain includes tasks for general and administration services, which are mapped below (where possible):

- Administration and other offices;
- Security and emergency services;
- General and staff parking;
- Sewage systems; and
- Change houses.

The overall domain manager is the technical services manager.



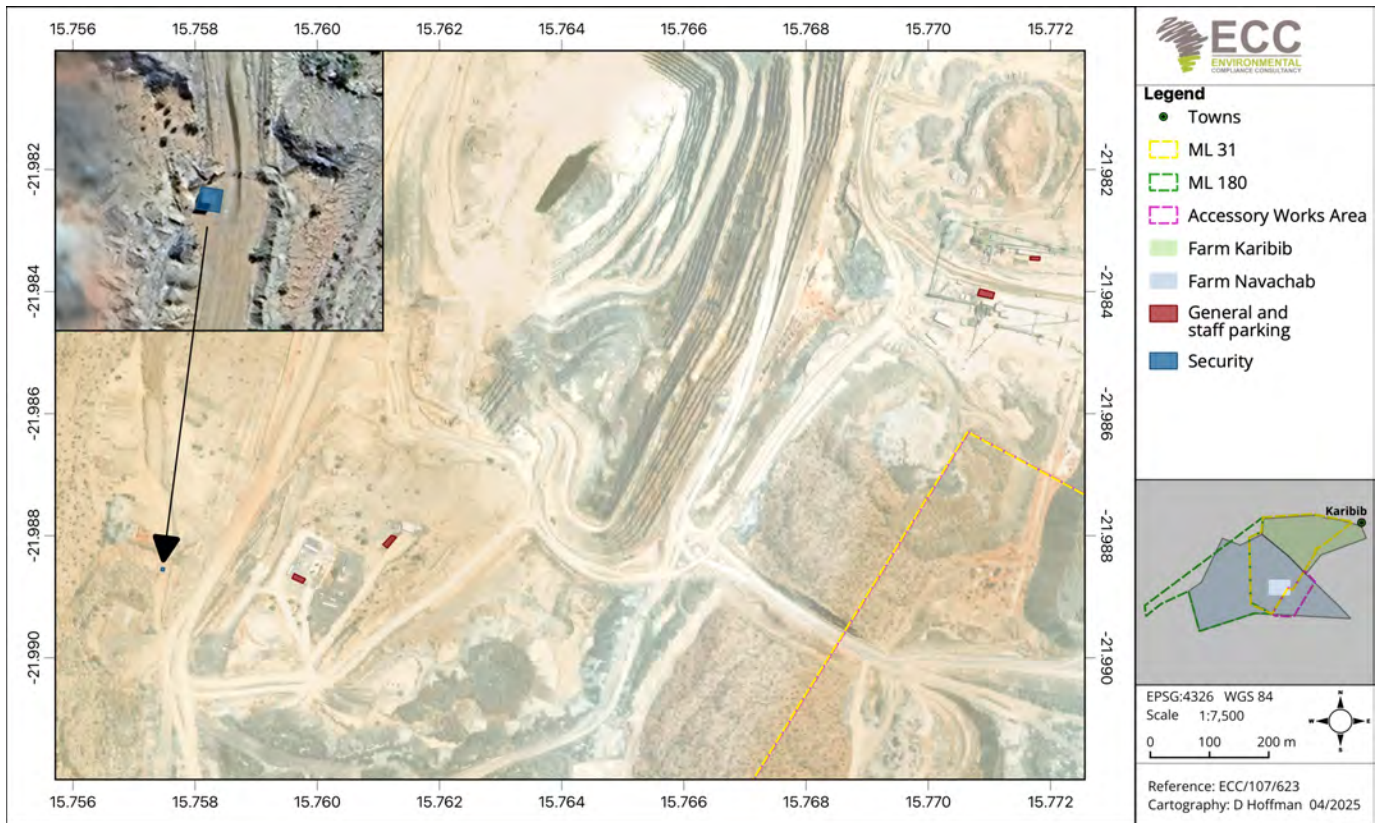


Figure 4 - Domain 2 map depicting general infrastructure

Table 3 – Environmental management plan for Domain 2; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Training and awareness	Lack of environmental knowledge on OEMP requirements leads to environmental incidents	– All employees, visitors and contractors are required to go through a general site induction when entering the mine site; – Environmental section to provide weekly information regarding environmental issues of concern; – Awareness will be distributed by various channels as deemed appropriate; – Notice/awareness boards to be kept up to date with the latest information shared; and – All vehicles to reverse park on the mine site.	– Environmental audits and inspections	– Technical services manager
Domestic effluent water management	Lack of appropriate ablution facilities can result in soil contamination and pollution	– Only approved ablution facilities to be utilised; – No employee or contractor on Navachab site 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	– Environmental audits and inspections – Effluent monitoring programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		24 hours of the incident occurring; – Sewage facilities to be permitted with DWA; – Septic tanks to be pumped out on a regular basis to avoid overflows; – Grey water to be separated from effluent water and be reused; – Regular effluent water quality samples to be taken by the Environmental section; – Environmental friendly products to be used for the trickling filter plant; and – Sanitary bins to be provided in all female toilets and sanitary waste to be discarded correctly.		
Waste management (non-mineralised)	Littering and pollution of soils/groundwater	– Waste must be disposed of in the waste receptors provided, no litter, especially in the parking areas where these receptacles might be scarce; – Waste must be separated at source as per the waste management procedure in the	– Environmental audits and inspections	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		correct colour coded bins and/or skips; – Waste receptacles can be supplied on request to the Environmental section; and – Bins and skips must have lids, that can seal and are scavenger/baboon proof.		
	Inappropriate disposal of hazardous waste, leading to environmental, health and safety hazards	– Smoking to occur in designated areas, clearly marked and only designated ashtrays to be used; – Chemicals used in the office environment must have accompanying material safety data sheets (MSDS) and be registered with the Environmental section and the onsite clinic; – Medicine at the site clinic must be appropriately handled and stored, with accompanying MSDS, where required; – Medical waste and expired medicines must be disposed of off-site at the incinerator at the Walvis Bay landfill site; – Sanitary waste to be collected by a registered company	– Environmental audits and inspections – Waste records – Safe disposal certificates	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		that can appropriately handle and dispose of this biohazard waste; – All biohazard waste associated with entry into the mine (e.g. masks, straws used for breathalysing) must be handled correctly and disposed of as hazardous waste at a registered hazardous waste facility; – Records to be maintained of the disposal of hazardous waste; – All hydrocarbon spills from vehicles to be cleaned up by the responsible person.		
Housekeeping	Soil and groundwater pollution due to littering	– Each employee or contractor is responsible for housekeeping in their work areas, which includes the offices and general areas; and – These areas be kept clean and maintained in a clean, orderly and presentable condition at all times, no littering is allowed.	– Environmental audits and inspections	– Technical services manager
Hygiene	Lack of appropriate and clean facilities for hand washing,	– Bathrooms, change houses, offices, kitchens and boardrooms to be	– Environmental audits and inspections – Pest control programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	showering and basic amenities	cleaned on a daily to weekly basis; – Food scraps to be disposed of as general waste; – Where pests persist, pest control programme to be implemented to remove the pest, after consultation with the Environmental section; – Basic amenities to be provided such as hand soap, wash clothes, toilet papers, microwaves, kettles, dishwashing liquid etc.; and – Sanitizers to be available for all staff at points of entry and exit from buildings.		
Stormwater management	– Flood risks to the entire mine operations	– In order to avoid flood risks from the north of the site to the entire mining operations, the following clean water diversions are required to be installed as per the 2023 SWMP: ○ A clean water diversion (berm and channel) to be installed from C05 catchment to C13 catchment in a northern direction (J01 to J08, from J08 to J17	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		to OF1) as per the 2023 updated SWMP plan; ○ A clean water diversion (berm and channel) to be installed from J10 to the indicated pipeline in C06 in a southern direction; ○ A clean water diversion (berm and channel) to be installed from J09 to the indicated pipeline in C06 in a northern direction; ○ The clean water pipeline will follow an east to northwest flow direction, whereby it will connect with J12; and ○ A clean water diversion (berm and channel) to be installed from J12, in a northly flow direction to J16, whereby the water will channel to J17 and be released to OF1; and – Dirty water will be treated with that of the processing plant and be channeled into a dirty water diversion (berm and channel) to the north of the offices (J30 flowing northwards to J32), with end collection		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		point in pollution control pond No.1.		
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure. – A lack of progressive rehabilitation and failure to revegetate the landforms	– Develop a rehabilitation plan and implement the requirements stipulated therein; – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and – Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required.	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Technical services manager

2.7 DOMAIN 3: OPEN PITS

This domain includes tasks for the open pit mining activities, which are mapped below:

- Main pit;
- Gecko satellite pit;
- Anomaly 16 satellite pit; and
- Steenbok satellite pit.

Rehabilitation and closure requirements for the rehabilitated Grid A pit and waste rock dump will be described in this section. Note Steenbok satellite pit is not currently reflected in Figure 5 due to the infant stages of development and will be updated to reflect operational mining activities for future versions of the OEMP.

The overall domain manager is the operational mining manager.

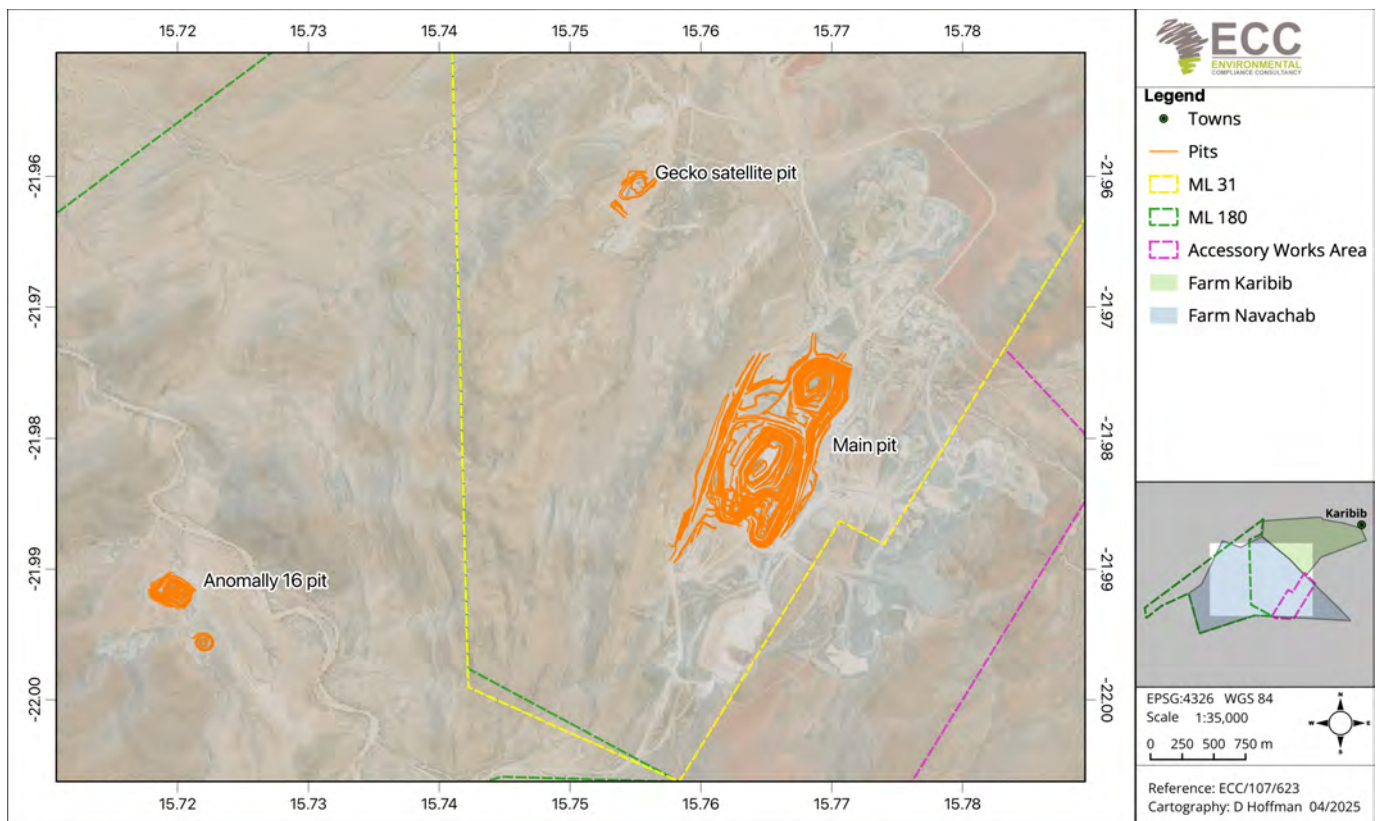


Figure 5 - Domain 3 map depicting the active open pit locations

Table 4 – Environmental management plan for Domain 3; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Training and awareness	Lack of environmental knowledge on OEMP requirements leads to environmental incidents	– Environmental section to provide weekly information regarding environmental issues of concern; – Line management to discuss topics with teams; – SHE representatives will be employed by contractor staff to brief staff on their company SHE topics and those of Navachab; – Awareness will be distributed by various channels as deemed appropriate; – Daily site inspections to ensure SHE requirements are adhered to; – SHE files to be maintained per shift as per Navachab requirements; and – Incident reports covering OHSE to be included, including lessons learned and corrective actions.	– Environmental audits and inspections	– Operational mining manager – Technical services manager
Potable water	No availability of potable water at Anomaly 16 satellite pit	– Potable water can be sourced from AN BH and will supply the contractor workshops facilities; – A pump, flow meter and storage facilities	– Environmental audits and inspections – Abstraction volume recordings and records	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		for water to be in place before use; – The environmental section will record monthly meter readings to be reported to DWA, as per permit conditions; and – The Environmental section will conduct water quality chemical analysis of the borehole water on a monthly basis or as defined in the monitoring programme.		
	Lack of potable water supply	– In remote working areas in the pit, with the changing work environments, potable water cannot be sourced through related infrastructure and employees should take water with them in canisters from the offices or change houses; and – Routine monthly potable water quality testing will be conducted at supplied water sources.	– Environmental audits and inspections – Potable water monitoring programme	– Operational mining manager – Technical services manager
Soils management	Disturbance footprint management	– Only designated surface roads, haul roads or paved areas will be utilised;	– Environmental audits and inspections	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Boundary berms to be constructed, where required; and – Topsoil to be removed, where feasible.		
Domestic effluent water management	Lack of appropriate ablution facilities can result in soil contamination and pollution	– Only approved ablution facilities to be utilised; – If additional ablution facilities are required, the Environmental section to be informed; – Ablution facilities must be easily accessible for employees, onsite security and contractors to use in remote working areas; – No employee or contractor on Navachab site 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; – Septic tanks to be pumped out on a	– Environmental audits and inspections – Effluent monitoring programme	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		- regular basis to avoid overflows; – Grey water to be separated from effluent water and be reused; and – Regular effluent water quality samples to be taken by the Environmental section.		
Waste management (non-mineralised)	Soil and groundwater pollution due to littering	– Litter generated during shift must be collected in plastic bags and/or stored directly in the waste receptors provided; – Waste must be separated at source as per the waste management procedure in the correct colour coded bins and/or skips; – Waste receptacles can be supplied on request to the environmental section; – Bins and skips must have lids, that can seal and are scavenger/baboon proof; – No waste may be burnt or buried on site; – No fires will be allowed on site, unless in approved designated areas	– Environmental audits and inspections – Waste records – Safe disposal certificates	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		allowed by the OHSE manager; - Domestic waste is disposed of weekly at the non-mineralised waste site; - Scrap metal to be collected in dedicated bunded areas and the Environmental section informed when collection is required; - Hazardous waste created including empty containers, hydraulic pipes, oil filters (etc.) should be removed from site and disposed of at a suitable registered hazardous waste facility; and - A copy of the safe disposal of these wastes to be maintained as a record on file and provided to the Environmental section on request.		
Hydrocarbon management	Incorrect hydrocarbon management can lead to soil and groundwater contamination or injury/mortality to fauna and flora	- Sufficient drip trays should be made available to capture leaks and prevent pollution from mining fleet; - Spill kits and spill absorbent treatment material to be present in the pit area for quick reaction times	- Environmental audits and inspections - Pre-start inspections	Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		to handle small and large spills; – Incident reports to be compiled for each spill event as per the incident management procedure; and – Soils to be treated <i>in situ</i> and where this is not possible, soils to be removed to the bioremediation facility for further treatment.		
Air quality	Air pollution and dust emissions through vehicle emissions	– Diesel exhaust fumes/emissions from heavy machinery on site (excavators, front end loaders and haul trucks) must be controlled and minimised by regular checks and servicing of vehicles; – Any mining or construction vehicle found to be emitting excessive smoke or hydrocarbon spillage will be stopped from operating until found to be mechanically sound; – Blasting should be conducted during period of atmospheric instability or as per the blasting regulations to allow for maximum dispersion of dust that has been created;	– Environmental audits and inspections – Pre-start inspections and services – Air quality monitoring programme	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Fall out dust, PM_{10/2.5} and passive gases monitoring campaigns to be conducted in and around the open pits; – Adherence to speed limits on unpaved roads and surfaces; – Regular dust suppression through chemical binding agents and watering of roads, surfaces and stockpiles; – Additionally, goosenecks to be established where required; and – Alternate plans need to be in place for dust suppression as mining activities will be stopped if dust levels become too high.		
Noise management	Disturbance to third parties, fauna and flora	– Regular noise and vibration monitoring to be conducted around pits and processing plants, as well as on the neighbouring farm, Mon Repos; – To limit disturbance to the farmer, hauling of material from Anomaly 16 pit to the main mining areas/ROM, should take place during	– Environmental audits and inspections – Noise and vibration monitoring programme – Community liaison records	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		daylight hours as far as possible; and – If nighttime hauling is required, the neighbour needs to be consulted.		
Power generation	Incorrect supply and storage of power generators results in reduced mining operations and/or soil/groundwater contamination	– 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.	– Environmental audits and inspections – Fuel records	– Operational mining manager
Heritage sites	Loss or damage to heritage sites	– Two significant archaeological sites are located in ML 31, guano mining site (QRS 114/7) and possible iron wagon tyre quenching bath (QRS 114/8) and may not be disturbed; – Chance finds to be reported to the Environmental section in line with the Chance Finds Procedure; and	– Environmental audits and inspections – Archaeological monitoring programme	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		No authorised removal or damage to artefacts is allowed.		
Biodiversity	Damages, injuries and/or mortalities to fauna and flora	- 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 firewood collection is allowed; - No large tree in the Kachab river may be uprooted for haul road construction; - Wherever large trees are encountered that are in the way, the road should be designed around them although limited trimming of branches with a chainsaw can be done; - Permits to be acquired from MEFT if protected trees are to be removed and/or relocated; - No hunting or poaching is allowed on Navachab farm; - No unauthorized removal of vegetation is allowed; - Baboons are pests and therefore require	- Environmental audits and inspections - Biodiversity monitoring programme - Mine closure plan	- Operational mining manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		specific management, no feeding should be allowed; – Fauna and flora incidents to be reported and recorded as per the incident management procedure; – Leopard, cheetah and hyena occur in the area and can be discouraged by making loud noises, such as hooting; – Briefings on snakes and snake bite first aid treatments will be conducted; – Non-venomous snakes like mole snakes and egg eaters should be captured into a container and removed from site; – The killing of venomous snakes is not encouraged (e.g. mamba, puff adder and zebra snakes); – Boa constrictors should under no circumstances be harmed or killed as they are protected by law; and – Contact the Environmental section to remove the snake should it be within the mining or construction area.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Conservation of fountains, springs and rivers not maintained	– No pumping from fountains/springs is allowed, especially in the Kachab river; – Avoid general disturbance to this area; – No soils to be collected from the rivers; and – The river should not be used as a general access route.	– Environmental audits and inspections – Biodiversity monitoring programme	– Operational mining manager
Groundwater	Groundwater passive inflow into pits causing geotechnical instability	– The groundwater passive inflows increase during mining, reaching a peak of 308 m³/day, towards the end of mining. It is estimated that the predicted inflows can easily be handled by sump pumping, and active dewatering boreholes are not specifically required, unless geotechnical studies show critical geotechnical domains, where depressurisation may be needed; – Pit dewatering water is either used for dust suppression or released to an ephemeral water course, in line with permit conditions;	– Environmental audits and inspections – Groundwater database – Pit dewatering records	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Volumes of water abstracted is recorded and reported to DWA, in line with permit conditions; and – Annual updating of groundwater model recommended.		
Housekeeping	Littering and soil/groundwater pollution	– Each employee or contractor is responsible for housekeeping in their work areas; – The pit areas and surrounds to be kept clean and maintained in a clean, orderly and presentable condition at all times; and – The various pits to be inspected on a monthly basis by the relevant supervisor, line manager and/or manager.	– Environmental audits and inspections	– Operational mining manager
Stormwater management	Flood risks to the rehabilitated Grid A pit and pollution control	– A clean water diversion (berm and channel) to be installed on the eastern boundary to the southwestern boundary of Grid A pit. The water will flow from an easterly to westerly direction (J07 to J08, from J08 to J17 to OF1) as per the 2023 updated SWMP plan; – A berm to be constructed on the	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		northwestern boundary of Grid A to contain contact/dirty water; and – Dirty water will be contained within the pit area, collecting to a site in the pit P6_O; and – A dirty water diversion (berm and channel) to be constructed from north, around the waste rock dump, connecting on the western side by the most southern tip of the western berm (J62 to tip of western berm).		
	Flood risks to the AN16 central pit and pollution control	– A clean water diversion (berm and channel) to be installed on the eastern boundary of AN16 pit. The water will flow from a south east to a north direction (J19, J20 to OF3); – A berm to be constructed on the northwestern boundary of AN16 to contain contact/dirty water; and – Dirty water will be contained within the pit area, collecting to sites in the pit (P4_O and P5_O) and	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		informal storage areas (S13_O and S14_O).		
	Flood risks to the Gecko central pit and pollution control	– A clean water diversion (berm and channel) to be installed on the eastern boundary of Gecko satellite pit and Steenbok satellite pit. The water will flow from a southeast to a north direction (J14, J17 to OF1); – A clean water diversion (berm and channel) to be installed on the northwestern boundary of Gecko satellite pit. The water will flow from a northwest to a north direction (J18 to OF2); – A dirty water diversion (berm and channel) to follow the same route of the clean water diversion on the eastern boundary, located on the inside of the clean water diversion (J58 to J6), flowing into pollution control pond No. 5; and – Dirty water will be contained within the pit area, collecting to sites in the pit (P2_O and P3_O) and	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		informal storage areas (S13_O and S14_O).		
	Flood risks to the main central pit and pollution control	– The main pit acts as a self-storing dirty water collection pit (P1_O); – A dirty water diversion (berm and channel) to be constructed on the western pit boundary, J56 and J57 will flow from north to south, collecting in pollution control pond No. 3, whereas J54 to J55 will flow from south to north, collecting in the same PCP; – A dirty water diversion (berm and channel) to be constructed on the southern pit boundary, J48 and J59 will flow from west to east, collecting in pollution control pond No. 2, whereas J46 to J47 will flow from east to west, collecting in the same PCP; – A dirty water diversion (berm and channel) to be constructed on the eastern pit boundary, J36 to J43 will flow along this boundary to the north of the pit; – A dirty water diversion (berm and channel) to be constructed on the north western pit	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		boundary, J42 will flow northwards to meet with J43; and – The water collecting at J43 will flow further northwards to J45, where it will flow and collect into pollution control pond No. 1.		
	Contact stormwater not contained leading to pollution	– Stormwater and/or groundwater inflows are managed within the pits; – Sumps to collect stormwater that collects in the pits; and – Where large storage areas (>10 000 m³) exist, containment of dirty water by these areas to continue.	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operational mining manager
	Risk of erosion of pit walls from excessive stormwater routed over these structures	– Limit the amount of stormwater routed into a pit (i.e. preventing stormwater generated beyond the boundary of a pit from flowing into the pit); and – Define larger areas that drain into the pit and manage this stormwater separately by routing the flow into suitability-sized pollution control ponds, which can also be conceptualised as sumps.	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Geotechnical	Pit wall stability failures due to elevated pore pressure	– The open pits will continue to be regularly inspected by geotechnical engineers; – Pore pressures will be monitored on an ongoing basis utilising a series of piezometers located around the pit; and – The need to install an active dewatering system to depressurize the pit walls will be considered as the pit deepens.	– Regular geotechnical inspections – Piezometer monitoring programme	– Operational mining manager
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate the landforms	– Develop a rehabilitation plan and implement the requirements stipulated therein; – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		implemented timeously; – Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required; – Navachab to determine a timeline, based on life of mine planning, when open pits are required to be closed; and – Vegetation survey of adjacent local environment to be conducted, per structure (open pit)), to determine what vegetation to be re-introduced in advance of planned re-vegetation.		

2.8 DOMAIN 4: UNDERGROUND MINING

This domain includes tasks for the underground mining activities, which excludes the expansion to phase 2 mining operations. The overall domain manager is the underground mining manager.

Table 5 – Environmental management plan for Domain 4; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Employee health and safety	Underground ground control and ground support failures	- Navachab's safety management plan will ensure that the standard operating procedure (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 control plan will be developed; - Navachab will ensure that the application of a rigorous mine design process is in place; - Prior to mining, and refined as data becomes available, Navachab will ensure a ground conditions model is developed; - Ensure that the evaluation of long-term ground control requirements is incorporated into the sites'	- Ground stability monitoring - Pre-shift ground condition and support checklists.	Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		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.		
	Underground fire incident	– 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	– HSE audits and inspections	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		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.		
	Collision of underground mining equipment causing injury to people	– Ensure that procedures are in place to minimise the instances where pedestrians and operating mobile equipment are in	– HSE audits and inspections – Pre-start checklists on all machines	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		the same area at the same time; – 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 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	– 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;	– Monitoring of surface and groundwater levels – Daily inspections	– Underground mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Implement a systematic collection and analysis of data; – Evaluate of climatic conditions; – Identify risks of operating near water; – Ensure that consideration of pathways for intrushes is evaluated at each phase; – Develop, apply and monitor lead indicators; – 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; – Ensure that there is a method for open and clear communication of		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		experiences and outcomes of inrush and subsidence events; – Temporary collection sumps should be constructed for accumulated groundwater to be managed with haulage drains (ensure the dewatering program is followed and monitoring and reporting on the dewatering plan is undertaken; – Measure groundwater inflow volumes into the working areas so that any required adjustments to groundwater management can be implemented to ensure safe and dry mining; – During cover drilling in areas with poor ground conditions, the presence of groundwater and the volume of its flows should be monitored and recorded; – Ensure adequate pumping capacity with back up pumps as critical spares are kept on site; – Maintain documentation of groundwater occurrence depths together with descriptions of the geological structures associated with it; and – Maintain the groundwater monitoring program for the Project and establish		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		additional groundwater monitoring piezometers around the northern pit.		
Surface water	Sediment loading of surface water from decline development activities	– Installation of diversion structures to divert non-contact surface water away from and around the mining operations; – Ensure wastewater produced during the construction of the decline development is directed into the open pit; and – If the volume of water is too large and cannot be handled concurrently with open pit 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.	– Mine water balance – Daily inspections	– Underground mining manager
	Sediment loading of surface water from uncontrolled surface discharge of underground mine wastewater	– 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	– Mine water balance	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		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 operations commence and the water quality is better known and understood.		
	Discharges of chemicals to surface water	– 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 – Daily inspections	– Underground mining manager – Technical services 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	– Underground mining manager
Groundwater	Contamination of groundwater from underground mine operations including hydrocarbons	– Ensure correct chemical use and explosive charging practices are in place and followed for underground mining operations; – Bulk fuel will not be stored underground and majority of fleet refuelling will occur on surface; and	– Groundwater monitoring – Daily inspections	– Underground mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	and explosives	Refuelling of drills and equipment working at the face will be done in a controlled manner following standard underground refuelling procedures.		
	Potential for inrush into the underground mine workings during development and operations	- 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.	- Groundwater monitoring - Daily inspections	Underground mining manager
	Further reduction in the water table could affect deep rooted tree survival during droughts	Monitoring groundwater levels and physiological stress levels in trees to see if a correlation exists.	- Groundwater monitoring - Vegetation monitoring	Technical services manager
	Improper management of sewage and greywater from underground	- Install sealed, watertight underground sewage tanks and dedicated greywater sumps; - Treat all effluent using on-site wastewater treatment	- Groundwater monitoring - Waste management plan	Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	mining facilities can introduce pathogens and organic matter into subsurface water systems, polluting drainage lines and surface water bodies	plants before reuse or discharge; – Reuse treated water for dust suppression or non-potable purposes only; – Provide adequate, accessible and well-maintained toilets and handwashing stations underground and on surface; – Enforce zero open defecation, urination and proper hygiene practices; – Train workers on sanitation, disease prevention and waste handling; – Use impermeable liners and leak-proof piping for all wastewater systems; – Implement secondary containment and alarms for tanks and sumps; – Conduct regular water quality monitoring (<i>E. coli</i>, BOD, EC etc.) in groundwater and surface water; – Inspect and maintain sewage and greywater systems weekly; – Equip sites with spill response kits and a sewage spill response plan; – Contain and treat any contaminated water; disinfect or replace affected soil;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Provide handwashing facilities with soap or sanitizer; – Ensure safe potable water separate from greywater; – Conduct health screenings and awareness campaigns; – Decommission, disinfect, and seal tanks and sumps at closure; and – Continue post-closure groundwater monitoring for pathogens and nutrients.		
	Hazardous waste including used batteries, solvents, paints and chemical containers containing toxic or corrosive substances can contaminate soil and water if not securely stored	– Store batteries, solvents, paints and chemical containers separately in labelled, banded, and ventilated areas; – Keep storage covered, shaded, and organised to prevent spills or leaks; – Use secondary containment for all hazardous waste; – Keep spill kits and absorbents nearby; – Use airtight containers for volatile or corrosive chemicals; – Train staff on safe handling and transport; – Follow SOPs for labelling, storage and transfer of hydrocarbons and chemicals; – Recycle batteries through licensed recyclers; – Neutralise acids/bases and dispose of chemicals at	– Groundwater monitoring – Waste management plan – Daily inspections	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		licensed hazardous waste facilities; – Avoid disposal in unlined pits or general landfills; – Train staff in spill containment and first aid response; – Minimise storage duration; remove and treat/dispose of waste promptly; – Decontaminate storage areas at closure; and – Conduct post-closure soil and groundwater monitoring		
	Cemented backfill composed of waste rock or tailings from underground mining activities can potentially leach alkaline compounds or trace metals into groundwater, if not properly cured	– Use low-cement mixes and replace part of the cement with pozzolanic materials (e.g ash, slag) to reduce alkalinity; – Test and characterise all backfill materials for sulphide and metal content before use; – Ensure proper encapsulation and curing of sulphide-rich materials to prevent exposure to water; – Maintain strict quality control (QA/QC) records for each batch (mix ratios, curing time, pH checks); – Enforce minimum curing times before contact with groundwater; – Avoid placing uncured backfill near fractures or faults; – Grout or seal fractures and faults near backfill zones	– Groundwater monitoring – Rehabilitation/ closure plan	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		to block contaminant pathways; – Install drainage and collection systems to capture any seepage before it reaches the aquifer; – Use hydraulic cut-offs or barriers (e.g., slurry walls) to contain leachate; – Establish baseline groundwater quality and install piezometers up- and down-gradient; – Monitor pH, electricidal conductivity, sulphate, metals monthly (more often during placement); – Set trigger levels for pH or metal increases and define response actions (e.g., stop placement, investigate and treat seepage); – Treat collected leachate using lime precipitation, ion exchange, or reverse osmosis; – Consider passive systems like permeable reactive barriers to capture down-gradient metals; – Maintain post-closure monitoring and update hydrogeological models with new data; – Keep a contingency fund for emergency treatment; and – Engage local stakeholders and report monitoring results transparently.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Leakage or spillage from hydrocarbon-based fluids from machinery, compressors during or drill rigs due to improper waste handling can lead to groundwater contamination	– Maintain machinery regularly, store fuels in bunded tanks, and minimise on-site storage; – Conduct refuelling in designated areas with trained personnel and use drip trays or containment mats; – Place drip trays under stationary machinery and portable containment mats during refuelling to capture minor leaks; – Store fuels, lubricants, and other hydrocarbons in bunded tanks or containers with spill containment measures capable of holding at least 110% of the tank volume; – Keep only the minimum necessary quantities of hydrocarbons on-site to reduce the potential spill volume; – Store hydrocarbons away from surface water channels and in areas with low infiltration potential; – Maintain well-stocked spill response kits (absorbents, booms, sandbags, shovels) at key locations, and ensure staff are trained in their use; – In the event of a spill, immediately contain and remove the hydrocarbons from soil surfaces before infiltration occurs;	– Groundwater monitoring – Waste management plan – Daily inspections	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Implement a clear hydrocarbon spill response plan, including notification protocols and responsibilities; – Establish groundwater monitoring points downgradient of the construction area to detect early signs of contamination; – Conduct regular environmental awareness training for all personnel on spill risks and response procedures; – Carry out routine environmental audits to verify that hydrocarbon handling and storage practices comply with best practices; and – Prepare contingency plans for potential in-situ bioremediation or pump-and-treat methods if contamination occurs		
Air quality	Deterioration in air quality from odour and particulate matter (i.e. total suspended particulate matter (TSP), PM ₁₀ and PM _{2.5} (particulate matter of 2.5	– Ensure mechanical equipment is maintained and serviced to ensure particulate matter is reduced; and – Ensure ventilation systems are providing fresh air to working headings and the underground workings are exhausted after each blast.	– Pre-shift access checklist – Air quality monitoring – Personal exposure monitoring	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	micrometres or less in diameter) and dust deposition) from the underground			
	Ventilation discharged from the underground workings via the portal could contribute to offensive odours	– 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.	– Air quality monitoring – Personal exposure monitoring	– Underground mining manager
	Air quality and greenhouse gas (GHG) emissions from underground mining activities	– 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.	– GHG emission reporting	– Underground mining manager
Resource use	Inefficient use of water resources	– Use water effectively and efficiently by following the reduce-recycle-reuse approach; and – Record volumes of abstraction and supply.	– Daily observations – Mine water balance	– Underground mining manager – Technical services manager
	Inefficient electricity use increasing carbon footprint	– Rely on the use of the photovoltaic (PV) solar plant for the maximum electricity supply; and	– Track energy use	– Underground mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Use energy efficient electrical equipment and lighting underground.		
Built environment /nearby structures	Accidental detonation of the explosive magazines resulting in structural collapse of the underground mine support structures or blockage of access ways	– Equip underground and key surface areas with autonomous LED lighting and battery-powered ventilation systems that can operate independently for a minimum of 12–24 hours post-incident; – Maintain sealed refuge bays equipped with independent oxygen supplies, communications, and lighting for trapped workers in case of power loss; – Install dual-drive (diesel-electric) pumps and compressors to ensure continuity of ventilation and drainage during outages; – Conduct semi-annual mock explosion or fire drills simulating blocked access and power failure, involving mine rescue, firefighting and medical team; – Train all personnel on evacuation routes, refuge chamber locations and power failure protocols; – Integrate early warning systems capable of immediately detecting overpressure, fire, or power loss and triggering	– Pre-shift access checklist – Routine inspections of the explosive magazine yard by mining manager – Incident logs – Training records – Inventory check lists	– Underground mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		automated alerts across communication channels; – Keep emergency inventories of cables, transformers, lighting equipment and communication hardware to reduce downtime.		
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate the landforms	– Develop a rehabilitation plan and implement the requirements stipulated therein; and – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; – Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required; and – Navachab to determine a timeline, based on life of mine planning, when the underground mining operations are required to be closed.	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Underground mining manager – Technical services manager

2.9 DOMAIN 5: TAILINGS STORAGE FACILITIES

This domain includes tasks for the tailings storage facilities activities, which are mapped below:

- Tailings storage facility 1 (not active - rehabilitated);
- Tailings storage facility 2 (not active – decommissioning phase commencing); and
- Tailings storage facility 3 (under construction and commencement of operations), located southeast of TSF 2.

The overall domain manager is the processing manager. The environmental section and mine surveyors are responsible for respective monitoring.

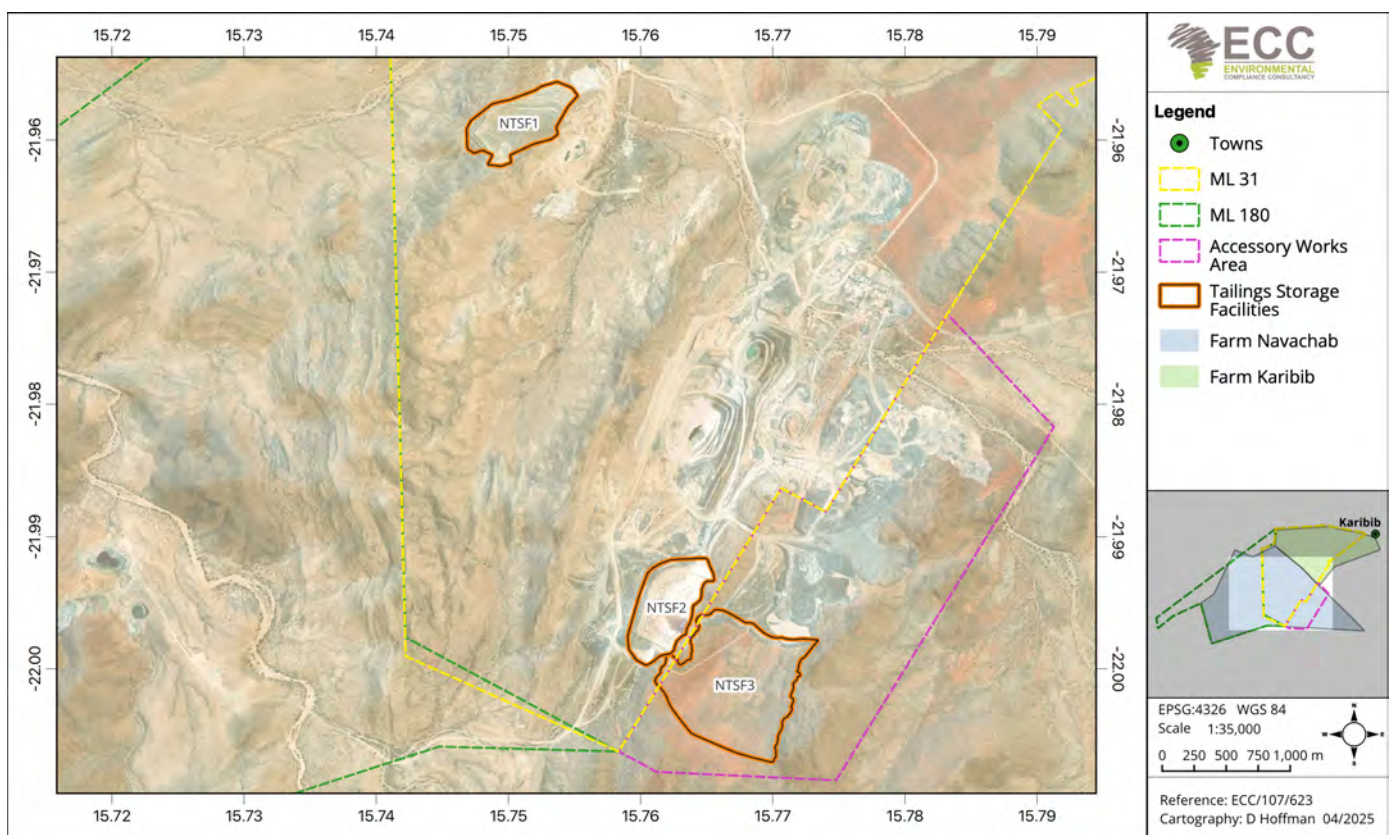


Figure 6 - Domain 5 map depicting the tailings storage facility locations

Table 6 – Environmental management plan for Domain 5; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Air quality	Dust emissions (TSP & PM ₁₀) from earthmoving activities, unsealed surfaces (e.g. roads) and from the surface of the tailings facility beach	– Dust suppression to continue on access roads utilising water or chemical binding agents; – Fall out dust (TSP) will continue to be monitored on a monthly basis, with additional dust gauges installed at prevailing wind directions for TSF 3; – If elevated dust readings warrant further mitigation, the site can implement a proactive approach to weather monitoring and when high winds are predicted, ensure an operational water system (spigots/sprinklers) is deployed to prevent excess dust being generated off the surface of the tailings; – Rehabilitation will be undertaken on final landforms (e.g. starter embankment) to minimise potential for dust generation and provide conditions for revegetation; and – The environmental section to inform the domain manager in	– Environmental audits and inspections – Air quality monitoring programme – Mine closure plan and closure schedule – Rehabilitation plan	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		advance when high winds are predicated.		
	SO _x , NO _x and CO _x emissions generated from operational activities (plant, diesel vehicles machinery, trucks)	Investigate the possibility of implementing a passive gasses sampling monitoring, as described in the air quality monitoring programme.	- Environmental audits and inspections - Air quality monitoring programme	Processing manager
Hydrology, hydrogeology and water quality	Altered hydrological regimes resulting in disruption of drainage lines, reducing downstream flows, flooding and increased erosion and sediment generation	- Ensure a robust monitoring system is in place to monitor and detect possible mine drainage matters; - Stormwater to be diverted around the starter walls to minimise erosion and sediment mobilisation; - The stormwater controls for Gecko satellite pit, as discussed in Domain 3, include the required controls for the management of TSF 1; - TSF 2 and TSF 3 act as a dirty containment area and will catch contact water (T2_O and T3_O); - A dirty water diversion (berm and channel) to be constructed from the south to a west direction of TSF 2 (J50 to J51) and collect in	- Environmental audits and inspections - Stormwater management plan - Water quality monitoring (groundwater and surface water) programmes	Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		pollution control pond No. 4; - A dirty water diversion (berm and channel) to be constructed from the northwest to south direction of TSF 2 (J52 to J51) and collect in pollution control pond No. 4; - Erosion protection measures may be required on stream diversion channels; - Tailings discharge and return water pipeline will be elevated on concrete plinths to above flood level at stream crossings; - Tailings discharge will be suspended during extreme flood events to minimise risk of tailings spillage if the pipeline breaches; - Concrete drifts to be constructed at low points on ephemeral drainage courses that cross access roads to the TSF 2; - Concrete drifts will divert stormwater into pollution control paddocks constructed on the down slope side of the road, from which it will overflow via engineered spillways;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– These paddocks will be cleared out and maintained on a regular basis to maximise available storage space and ensure that they continue to function as designed; – Potential seepage monitoring from TSF 3 toe by visual monitoring around the facility and after rains for acid mine drainage; – Expand water quality monitoring network and programme to include groundwater and surface water monitoring locations for TSF 3. New groundwater boreholes to be drilled if required; – The processing manager to report monthly to the environmental section the volumes of tailings deposited into TSF 3, high incidents of cyanide and sulphate seepages recorded; and – The environmental section to inform the domain manager if contamination is detected from TSF 3.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Release of decant water to the environment resulting in pollution	- Decant water to be returned to the process and may not be released into the environment; - The TSF will be operated as per the OEM; - Volumes of water held in the TSF to be minimised; - The decant pond's cyanide levels will be kept below 50 ppm WAD (as specified by the International Cyanide Management Code); - On a daily basis, Navachab will monitor cyanide concentrations in the TSF' decant pond to ensure the threshold of 50 ppm WAD is not exceeded; and - Groundwater levels and water quality testing to be conducted regularly for the TSF boreholes, as per the groundwater monitoring programme.	- Environmental audits and inspections - Groundwater monitoring programme - Area owner daily inspections - Operations manual	- Processing manager - Technical services manager
	Impact of seepage water from the TSF on groundwater flow and quality	The TSF and related infrastructure will be managed and operated according to the OEM;	Environmental audits and inspections.	- Processing manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		- Where possible, the TSF must be lined; - The decant pool of TSF 2 and TSF 3 will be maintained away from the eastern ridge to minimise the potential for seepage to occur along the contact between the quartzite and Kalahari sand cover; - The volume of decant water stored will be minimised reducing the hydraulic head; - The TSF 2 floor will be covered as soon as possible with low permeability tailings to minimise seepage potential; - An underdrain system to be installed to intercept seepage and return intercepted water to the decant pond from where it will be pumped back for use in the process; - The seepage interception dam will be constructed 200 m south of TSF 2 to collect shallow seepage and return it to the TSF basin for recirculation to the plant; - Groundwater quality will be monitored at boreholes	- Groundwater monitoring programme. - Area owner daily inspections. - TSF operations manual.	

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		downgradient of the TSF; - A seepage interception system in the form of a series of boreholes will be installed along the northern wall to intercept seepage and pumped back into the processing circuit; - Monitoring of the interception boreholes to pick up seepage from TSF 3; and - Measures to maintain and upgrade the seepage interception system will be described in the OEM.		
	Significant changes in the phreatic surface within TSF 3 can lead to the discharge of contaminated water into groundwater through seepage	- Controlling the water balance of the TSF by reducing excessive inflow of external water into the TSF, especially during a heavy rainfall event; - Design and implement a proper stormwater diversion system network to channel runoff away from the TSF basin; - The design of the TSF should maintain a 1-meter freeboard to absorb direct rainfall volumes safely; - This and other factors for example, the physical properties of the tailings material	- Environmental audits and inspections - Groundwater monitoring programme - Area owner daily inspections - Operations manual	- Processing manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		and the presence of cracks and fissures will determine the susceptibility of the TSF to allow seepage; and - The probabilistic water balance calculated by the mine is currently 86.39 %. A sharp reduction in this percentage will increase the risk of destabilising the TSF phreatic surface.		
	Impact from the seepage water of the TSF on surface water flow and quality, potentially contaminating springs	- The TSF and related infrastructure will be managed and operated according to the OEM; - Where possible, the TSF must be lined; - The decant pool of TSF 2 will be maintained away from the eastern ridge to minimise the potential for seepage to occur along the contact between the quartzite and Kalahari sand cover; - The TSF 2 floor will be covered as soon as possible with low permeability tailings to minimise seepage potential; - An underdrain system to be installed to intercept seepage and return intercepted	- Environmental audits and inspections - Surface water monitoring programme - Area owner daily inspections - Operations manual - Six monthly inspections on slopes down gradient	- Processing manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		water to the decant pond from where it will be pumped back for use in the process; - The seepage interception dam will be constructed 200 m south of TSF 2 to collect shallow seepage and return it to the TSF basin for recirculation to the plant; - This dam will be covered to prevent fauna from gaining access to the potentially contaminated water; - Measures to maintain and upgrade the seepage interception system will be described in the OEM; - Surface water will be monitored in line with the monitoring programme; and - The slopes down gradient of the TSF will be inspected on a six month basis to identify any new springs or seepage zones that may have developed.		
	Release of heavy metals and other contaminants to the groundwater as a result of acid mine drainage from	- Static geochemical testing has shown that waste rock and tailings are non-acid forming, which neutralises	- Environmental audits and inspections - Operations manual	- Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	sulphides exposed in the tailings, WAD cyanide and the starter wall waste rock material	potentially acid-generating potential; – The TSF and related infrastructure will be managed and operated according to the OEM; – As a precaution, the mine will determine the acid-generating potential of waste rock and tailings at six monthly intervals; – Should horizons with acid-generating potential be encountered, the mine will identify and implement management measures necessary to minimise the potential for the development of acid mine drainage; – The decant pond's cyanide levels will be kept below 50 ppm WAD (as specified by the International Cyanide Management Code); and – On a daily basis, Navachab will monitor cyanide concentrations in the TSF's decant pond to ensure the threshold of 50 ppm WAD is not exceeded.	– Six monthly testing of waste rock	
	– Increased turbidity and surface flow changes in the	– The TSF and related infrastructure will be managed and	– Environmental audits	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	downstream environment, due to increased sediment generation when clearing land, starter wall construction – Erosion from side walls and changes to drainage patterns/landscape	operated according to the OEM; – Stormwater will need to be diverted around the starter walls to minimise potential for erosion and sediment mobilisation, particularly of disturbed areas; – Erosion protection measures may be required on stream diversion channels; – Silt traps may be required downstream of the TSF to prevent choking the downstream environment; – Silt intercepted by these structures could be used for rehabilitation purposes; – The stormwater diversion system around the TSF will be regularly inspected, maintained and upgraded where necessary; – Implement sediment control measures during earthworks to filter sediment out of runoff before it enters streams during rain events; – Implement erosion control measures to	and inspections – Operations manual – Stormwater management plan and regularly inspections – Mine closure plan and closure schedule – Rehabilitation plan	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		reduce erosion during earthworks. – Minimise soil disturbance during construction activities to reduce sediment mobilisation during rain events; and – Rehabilitation trials will be undertaken on the TSF embankments to minimise erosion potential.		
	TSF breach or failure may increase sediment loading in surface water streams (within the zone of influence)	– The implementation of sediment control measures such as sediment basins, sediment ponds, and sediment traps can be effective in capturing and retaining the sediment before it enters surface water streams. These measures should be designed and maintained to ensure their effectiveness in mitigating sediment loading (ICMM, 2019); – The establishment of vegetative cover on disturbed areas can significantly reduce erosion and sedimentation. Vegetative cover can be established through seeding or planting, and appropriate species should be	– Environmental audits and inspections – Operations manual – Operational inspections – Rehabilitation plan	– Processing manager –

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		selected based on site-specific conditions (ICMM, 2019); – Regular monitoring and maintenance of TSFs and associated structures can help identify potential issues before they result in a breach or failure; and – Monitoring can include visual inspections, instrumentation, and remote sensing technologies, and maintenance can include repairs, modifications, and upgrades (ICMM, 2019).		
	During operations of TSF 3 it is possible for build-up or “mounding” of groundwater underneath the facility as an indirect consequence of seepage to occur	– Conduct a packer test to determine seepage rates per litre per second; and – Install piezometers around the TSF in boreholes to review water levels throughout the LOM of the TSF.	– Environmental audits and inspections – Operations manual – Operational inspections	– Processing manager
Resource use	Mine water consumption not optimised	– The mine will seek further opportunities to optimise water; – These measures will include maximising the volume of water returned from the TSFs for use in the plant; and	– Environmental audits and inspections – Monthly water balance	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		Water balance to be developed and implemented.		
Geotechnical stability	No monitoring of wall stability to prevent wall failures and release of tailings into the surrounding environment, including rivers/channels	- Ongoing geotechnical investigation and monitoring of TSF walls to ensure stability is maintained; - Monitor bund wall for any leakages and rehabilitate immediately; - Proper design and construction of the TSF wall is essential in preventing failure. The use of appropriate materials, construction techniques, and drainage systems can help to ensure the stability of the TSF wall; - Rehabilitate eroded areas annually – i.e. after the rainy season (during winter months); and - Monitor pore water pressure and regular tailings and embankment monitoring, maintenance, inspection and audits for TSF 3.	- Monthly reports - Geotechnical inspections as required	- Processing manager - Chief geologist
Biodiversity	Loss of natural habitats and biodiversity through land clearing required for TSF construction and	The domain manager will inform the environmental section of any areas that require vegetation	Environmental audits and inspections	- Processing manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	associated construction activities	removal for the month ahead; - The environmental section to obtain a land clearing permit in advance from the Ministry of Environment, Forestry and Tourism, Department of Environmental Affairs and Forestry, before land clearing activities can take place; - The domain manager should ensure that the land clearing permit process is triggered at the mine planning stage and therefore must include environmental consideration for future works. This is important in areas where recovery of topsoil or substrate material for rehabilitation is possible; - Grazing ground will be reduced due to a loss of vegetation but there is sufficient vegetation available on the surrounding farms; - Rehabilitation trials are ongoing on the walls of TSF 1 and similar trials must be conducted on the starter wall	- Mine closure plan and closure schedule - Rehabilitation plan	

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		embankments of TSF 2; – Once TSF 1, TSF 2 and TSF 3 are no longer required to be used for operational purposes, these facilities will be rehabilitated to safe and stable landforms and revegetated to restore habitats, in line with the mine closure plan objectives; – Limit the development to actual TSF 3 site only 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. rocky areas/hills 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; – Remove (e.g. capture) unique fauna and sensitive fauna before commencing with the development activities		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		and/or species serendipitously located during this period and relocate to a less sensitive/disturbed sites in the immediate area; – Remove unique and sensitive flora (e.g. <i>Moringa ovalifolia</i>) before commencing with the development activities and relocate to a less sensitive/disturbed sites in the immediate area; – Prevent and discourage the collecting of firewood as dead wood has an important ecological role – especially during the development phase(s). Such collecting of firewood, especially for economic reasons, often leads to abuses – e.g. chopping down of live and/or protected tree species such as <i>Vachellia erioloba</i>, etc. which are good quality wood; – Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		killing of perceived dangerous species (e.g. snakes, etc.) and collecting of wood as this would diminish and negatively affect the local fauna – especially during the development phase(s); – Attempt to avoid the removal of bigger trees during the development phase(s) – especially with the development of access routes – as these serve as habitat for a myriad of fauna; – Prevent and discourage fires – especially during the development phase(s) – as this could easily cause runaway veld fires affecting the local fauna, but also causing problems (e.g. loss of grazing and domestic stock mortalities, etc.) for the neighbouring farmers; – Rehabilitation of the disturbed areas – i.e. initial development access route “scars” and associated tracks. Preferably workers should be transported in/out to the construction sites on a daily basis to avoid excess damage to the		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		local environment (e.g. fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment; – 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 to the indigenous African wildcat found in the area. 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; – Initiate a suitable waste removal system (i.e. remove to Karibib and not store on site) as this often attracts wildlife – e.g. baboons and black-backed jackal, crows, etc. – which may result in		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		human-wildlife conflict issues; – Educate/inform contractors and staff on protected species to avoid and the consequences of illegal collection of such species; – Prevent the planting of potentially invasive alien plant species (e.g. <i>Tecoma stans</i>, <i>Pennisetum setaceum</i>, etc.) for ornamental purposes as part of the landscaping – e.g. TSF site, etc. Alien species often “escape” and become invasive causing further ecological damage as is evident from previous human habitation in the area (i.e. invasive aliens on site include <i>Nicotiana glauca</i>; – Eradicate/destroy all invasive alien plants encountered on site – e.g. <i>Nicotiana glauca</i>. This would ensure that the spread is limited and show environmental commitment; – Investigate the idea of employing an environmental officer during the construction phase(s)		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		to ensure compliance and minimise the overall impact on the fauna and the environment; – Incorporate hills as part of the TSF 3 bund walls; – Cover bund wall with soil to facilitate plant regrowth rather than leaving as exposed rock wall; and – Re-seed bund walls with seeds from sacrificed protected tree species – i.e. collect seeds from <i>Vachellia erioloba</i>, <i>Moringa ovalifolia</i>, <i>Sterculia africana</i>, etc. and re-seed after covered with soil.		
	Impact of TSF operations on fauna as a result of attraction to the facilities due to an additional water source	– Regular monitoring of wildlife, in particular avifauna; – The decant water chemical properties will not vary between TSF's and therefore is not considered to pose a significant threat on fauna health if consumed; – Cyanide levels in the decant pond will be maintained bellow 50 ppm WAD; – Cyanide concentrations in the decant pond will be	– Environmental audits and inspections – Daily monitoring of decant water CN levels – Monthly sampling and monitoring of decant water CN WAD concentrations	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		monitored on a daily basis; - Protocols to be in place when cyanide exceedances are experienced; - Monitoring of WAD cyanide at the barge and cyclone discharge i.e. solution and solid phase samples should occur as recommended; - The existing onsite laboratory facilities will be upgraded to analysis for WAD cyanide; - A sample of decant water will be submitted for a full suite of inorganic analysis on a monthly basis; - Any animal fatalities will be immediately reported to the Environmental section and an incident recorded, as per the incident management procedure; - Should any incident be shown to have resulted from contact with process solutions on the TSF, an environmental risk assessment will be conducted and management systems		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		will be revised accordingly; - The TSF to be fenced where possible to prevent fauna from gaining access; - Bird deterrent measures to be investigated and implemented, as required; - Training of TSF staff regarding bird identification; - Birds should be monitored (habitat utilisation and behaviour) at least three times a week, especially during the first hour of the morning when deposited cyanide species should be at its highest concentration and bird numbers are traditionally also at a peak (TSF 3) during the early stages of operations and during known migratory periods to determine trends; - Should WAD cyanide levels exceed the 50 ppm level, bird monitoring should increase to every day, and the duration per day should increase to ensure that any bird mortality is recorded;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– It should be ensured that only comprehensively trained personnel are engaged in bird monitoring and that refresher training of such individuals is regularly done; – A comprehensive database should be developed capturing all observational data as well as WAD cyanide levels, mortality events etc.; – External specialists should be regularly engaged to audit internal monitoring in order to ensure that quality standards are maintained; – External specialists should immediately be involved should suspected cyanide related bird deaths occur; – The effectiveness of any interventions should be monitored; and – Align where practical to do so, to best practices from the International Cyanide Management Code, which may include: - o Implement procurement, transport, handling,		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		storage, operations, preventative maintenance, and closure systems for cyanide - o Minimise use - o Establish a water management system designed to prevent release - o Implement measures to protect birds and livestock - o Implement measures to protect fauna from discharges to surface water and groundwater - o Provide spill prevention and containment measures - o Ensure quality control and quality assurance measures confirm cyanide facilities are constructed to engineering standards - o Implement monitoring programs to evaluate the effects of cyanide use on fauna and water resources.		
	Inappropriate track(s) management resulting in a loss of fauna and flora	– Avoid placing access routes (roads and tracks) through sensitive areas – e.g. over hills and along drainage lines. This would minimise the	– Environmental audits and inspections – Mine closure plan	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		effect on localised potentially sensitive habitats in the area; – 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 habitats in the area; – Stick to speed limits of maximum 30 km/h as this would result in fewer faunal road mortalities. Speed humps could also be used to ensure the speed limit. Lower speeds would also minimise dust pollution; – Implement erosion control. – i.e. avoid constructing tracks up steep gradients; 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	and closure schedule – Rehabilitation plan	

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		eroded and further development may exacerbate this problem. Avoid construction within 100 m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated flora and fauna; and – Use existing access route(s) as far as possible.		
	Loss of rare or endangered species	– Currently there is no rare or endangered species identified on the mine site, however daily observations to be reported to the Environmental section; and – Educate/inform contractors and staff on protected species to avoid and the consequences of illegal collection of such species.	– Biodiversity monitoring programme	– Technical services manager
	Impacts to fauna and flora due to effluent releases from pipeline ruptures as reagents in process water could be potentially toxic (e.g. cyanide, caustic, hydrochloric acid)	– The TSF and related infrastructure will be managed and operated according to the OEM; – TSF 2 has been designed in accordance with SABS 0286 standard to contain a 1:50 year flood event, persisting	– Environmental audits and inspections – Daily monitoring of decant water CN levels – Daily inspections	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		for 24 hours, with a 1 m freeboard. This will minimise the potential for failure, overtopping or other uncontrolled releases of decant water and/or tailings to the environment; – The amount of water retained on the TSF will be minimised to increase wall stability and maximise storage volume available to impound runoff from major storm events; – Cyanide levels in the decant pond will be maintained below 50 ppm WAD; – A seepage dam will be constructed 200 m south of TSF 2 to intercept shallow seepage that might daylight as contaminated spring flow; – Intercepted seepage will be pumped back to the decant pond for return to the process; – This dam will be covered to prevent fauna access to potentially contaminated water; – Tailings and return water pipeline will be inspected twice daily; – Pollution control paddocks will be	of pipelines and infrastructure	

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		constructed at low points along the pipeline route to contain any tailings that may be spilled during repair and maintenance work; - All tailings spillages will be immediately reported, recorded as incidents, cleaned up and returned to the TSF; - Secondary containment will be provided along the length of the tailings pipeline to restrict the spread of spilled tailings away from the source and direct spillage towards the pollution control paddocks; and - Secondary containment will be achieved by constructing access roads along one side of the pipeline and creating an earth bund on the other side of the pipeline.		
Archaeological sites	Potential disturbances or damages to heritage sites and/or artefacts	- No known sites of archaeological significance are located at TSF 1 and TSF 2; - Located at TSF 3 are three (3) archaeological sites	- Environmental audits and inspections - Archaeological monitoring programme	- Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		(QRS 340/1089, 340/1090 and 340/1091). The sites will be buried as tailings accumulate in the shallow valley selected for this purpose. QRS 340/1089 represents a burial (grave site), the other two sites are minor sites of no significance. Heritage consent will need to be applied for from the National Heritage Council for the construction of TSF 3 and destruction of the artefacts and/or relocation of the remains; – Regular monitoring of known sites at TSF 3 as per the monitoring programme; – Chance find procedure to be implemented if artefacts are discovered; – Assist in the recovery, relocation and safekeeping of valuable artefacts; and – The National Heritage Council to be informed if heritage sites of significance are discovered during construction and operations of the TSF's.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Visual	Visual impacts to third parties due to changes to landforms	– The waste rock used for starter wall embankments will be dumped at the angle of repose; and – Revegetation of the side walls in line with the mine closure plan objectives.	– Environmental audits and inspections. – Mine closure plan and closure schedules. – Rehabilitation plan.	– Processing manager – Technical services manager
Noise management	Impacts on third parties and employees, contractors and visitors to Navachab	– The position of the TSF's will not increase the overall noise impact from general mining operational activities, however occupational health and safety noise limits will continue to be implemented for personnel working around vehicles and machinery; – The TSF and related infrastructure will be managed and operated according to the OEM; – Annual occupational health noise surveys to be conducted by occupational health department; – Ambient environmental bi-annual noise monitoring to be conducted by the environmental section; – Implement measures to reduce noise from	– Occupational health and safety noise monitoring programmes. – Environmental noise monitoring programme. – Environmental audits and inspections. – Complaints register.	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		TSF 3 (construction and maintenance heavy equipment) if monitoring/community feedback detects noise breaches (especially at night); and – Third party noise complaints to be recorded.		
Soils management	Incorrect sourcing of material for the construction of starter walls	– Gravel will be sourced from existing borrow pits on the mine, where required; – Gravel can also be sourced from washed down sediment following major flood events in the ephemeral riverbeds spanned by the conveyor; – Calcrete will be sourced from pre-stripping of the pit area; – Borrow pits will be rehabilitated in accordance with the mine closure plan objectives; – If additional borrow pits are to be established, an environmental impact assessment must be conducted prior to establishment; and – Ensure the closure plan includes provisions for	– Environmental audits and inspections. – Mine closure plan and closure schedules. – Rehabilitation plan.	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		rehabilitation and that the schedule is adhered to prevent visual impacts from unrehabilitated areas.		
Housekeeping	Littering and soil/groundwater pollution	– Each employee or contractor is responsible for housekeeping in their work areas; – The pit areas and surrounds to be kept clean and maintained in a clean, orderly and presentable condition at all times; and – The various pits to be inspected on a monthly basis by the relevant supervisor, line manager and/or manager.	– Environmental audits and inspections	– Processing manager
Potable water management	Lack of potable water supply	– In remote working areas, potable water cannot be sourced through related infrastructure and employees should take water with them in canisters from the offices or change houses; and – Routine monthly potable water quality testing will be conducted at supplied water sources.	– Environmental audits and inspections. – Potable water monitoring programme.	– Processing manager – Technical services manager
Domestic effluent water management	Lack of appropriate ablution facilities can result in soil	– Only approved ablution facilities to be utilised;	– Environmental audits and inspections	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	contamination and pollution	– If additional ablution facilities are required, the Environmental section to be informed; – Ablution facilities must be easily accessible for employees, onsite security and contractors to use in remote working areas; – No employee or contractor on Navachab site 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; – Septic tanks to be pumped out on a regular basis to avoid overflows; – Grey water to be separated from effluent water and be reused; and – Regular effluent water quality samples to be taken by the Environmental section.	– Effluent monitoring programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Waste management (non-mineralised)	Littering and pollution of soils/groundwater	– Litter generated during shift must be stored directly in the waste receptors provided; – Waste must be separated at source as per the waste management procedure in the correct colour coded bins and/or skips; – Waste receptacles can be supplied on request to the Environmental section; – Bins and skips must have lids, that can seal and are scavenger/baboon proof; – No waste may be burnt or buried on site; – No fires will be allowed on site, unless in approved designated areas allowed by the OHSE manager; – Domestic waste is disposed of weekly at the non-mineralised waste site; – Scrap metal to be collected in dedicated bunded areas and the Environmental section informed when collection is required; – Hazardous waste created including empty containers,	– Environmental audits and inspections – Waste records – Safe disposal certificates	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		hydraulic pipes, oil filters (etc.) should be removed from site and disposed of at a suitable registered hazardous waste facility; and - A copy of the safe disposal of these wastes to be maintained as a record on file and provided to the Environmental section on request.		
Hydrocarbon management	Incorrect hydrocarbon management can lead to soil, surface water and groundwater contamination or injury/mortality to fauna and flora	- Sufficient drip trays should be made available to capture leaks and prevent pollution from equipment (construction and operational) at the TSF; - Mobile refuelling truck should be operated according to strict refuelling procedures to reduce the risk of fuel discharged to the environment; - Inspect the roadways for large and sharp rocks and steel that may rupture fuel and hydraulic systems on the construction equipment; - Maintain the work areas to ensure all potential damaging materials are regularly cleaned up;	- Environmental audits and inspections - Pre-start inspections	- Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Implement a spill prevention and clean-up plan on site. The plan should include measures to prevent spills, such as regular maintenance and inspection of equipment, and procedures to contain and clean up any spills that do occur; – Continuous visual inspections for leaks from machinery and equipment and spills occurring within the active construction areas coupled with clean-up action for spills observed; – Ensure proper storage, use and management of hydrocarbons and chemicals on site are implemented; – Spill kits and spill absorbent treatment material to be present at the TSF for quick reaction times to handle small and large spills; – Incident reports to be compiled for each spill event as per the incident management procedure; – Should a temporary satellite refuelling bay be needed for construction at TSF 3		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		then this will be established near the construction site to position the fuel tank in order to facilitate quick refuelling of equipment and machinery whilst construction is ongoing; - The satellite refuelling bay should be properly bunded to reduce the risk of fuel discharged to the environment, - Traces and spills of hydrocarbons observed from daily inspections should be cleaned up and be removed immediately; and - Soils to be treated <i>in situ</i> and where this is not possible, soils to be removed to the bioremediation facility for further treatment.		
Rehabilitation	- No rehabilitation plan in place resulting in impractical requirements at mine closure - A lack of progressive rehabilitation and failure to revegetate the landforms	- Develop a rehabilitation plan and implement the requirements stipulated therein; - Incorporate indigenous vegetation – especially the protected species e.g. <i>Moringa ovalifolia</i> – into the overall landscaping. indigenous species	- Mine closure plan and closure schedules - Rehabilitation monitoring based on rehabilitation plan	- Processing manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		require less water and overall maintenance; – Cover bund wall with soil to facilitate plant regrowth rather than leaving as exposed rock wall; – Commence preparing TSF 2 to meet the requirements detailed in the rehabilitation plan for final land closure forms and additional requirements. This entails conducting an assessment on the pollution plume, providing detailed engineering services to meet final landform requirements and acquiring contractor services to meet these requirements; – Reference sites (taking the wet and dry seasons into account) to be determined, marked and documented for TSF 2 for vegetation, invertebrate and mammal observations; – Update species list for nursery operations following TSF 2 reference site confirmation of vegetation; – Vegetation and method of re-		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		vegetation to be used in trials for TSF 2 to be determined; – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and – Confirm if any additional rehabilitation work is required for TSF 1, by conducting an infield assessment.		

2.10 DOMAIN 6: STOCKPILES

This domain includes tasks for stockpile activities, which are mapped below:

- Waste rock stockpiles (includes co-disposal); and
- Ore stockpiles.

The overall domain manager is the operational mining manager.

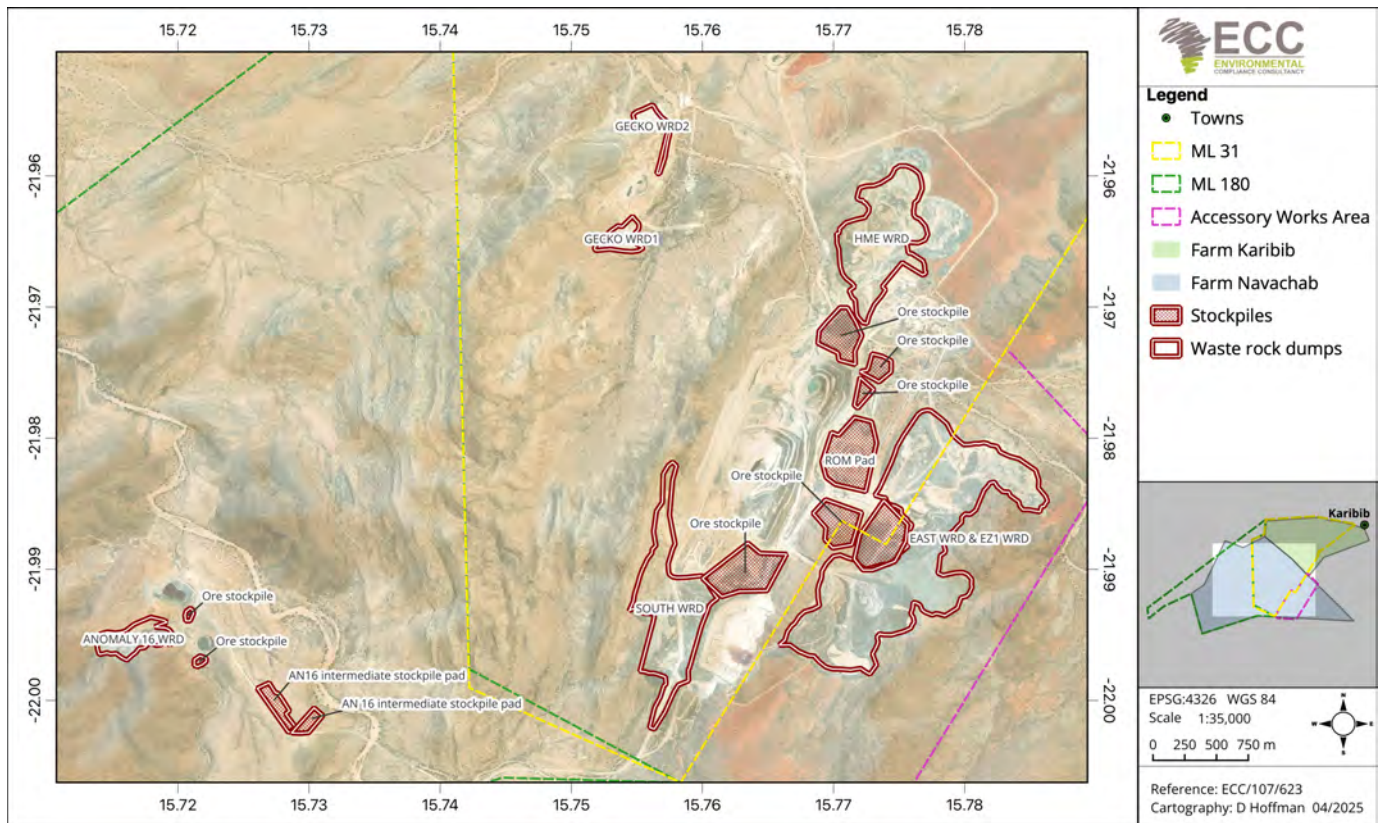


Figure 7 - Domain 6 map depicting the waste rock and ore stockpile locations

Table 7 – Environmental management plan for Domain 6; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Stormwater management	Flood risks to surface infrastructure, property and personnel and water quality issues related to pollution sources of waste rocks dumps and co-disposal facilities	– Dirty and clean water containment infrastructure and requirements for the waste rock dumps associated Grid A, Gecko and AN16 were discussed under Domain 3 stormwater requirements; – For the East WRD and EZ1 WRD, contact water will naturally collect in sumps, detailed as SU02 to SU11; – For the South WRD, contact water will naturally collect in sump SU12. Further details on dirty water containment for this WRD was discussed under Domain 3 for the central open pit; – A dirty water diversion (channel and berm) to be constructed from the most northeastern point of East WRD and EZ1 WRD (J34), flowing in a northwest direction to meet at the confluence of J35 and J38, further following this dirty water containment diversion northwards and depositing into	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		pollution control pond No. 1; - For the HME WRD, a dirty water diversion (channel and berm) to be constructed from the naturally occurring sump (SU01) at the corner of the waste disposal site, commencing from J31, connecting to J32 and flowing northwards along the boundary of this WRD to J33 and further westwards to J45 and depositing into pollution control pond No.1; and - The southern boundary dirty water will be channelled through J41 northwards to J45 and channelled into pollution control pond No.1.		
Air quality	Dust emissions from stockpiles	- Dust suppression measures to be implemented through the use of water sprays from water bowsers during stockpiling activities and high wind conditions; - Avoid handling loose material and fines when weather conditions are not	- Environmental audits and inspections - Air quality monitoring programme	- Operational mining manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		favourable (e.g. strong winds); – Air quality monitoring through dust fall out stations (TSP) and PM_{10/2.5} stations; – Trends to be analysed on a monthly basis and reported to management for corrective action, if results show unfavourably high TSP or PM_{10/2.5} levels, in accordance with the relevant standard(s) exceedances.		
Groundwater and surface water	Soil pollution from contact/dirty water	– All potential contact/dirty water from WRD's and ore stockpiles should be controlled and directed away from the natural environment, especially drainage lines, towards the respective pits; – Bunds should be erected around these stockpiles, where feasible, to contain contact water run-off; – Groundwater monitoring of boreholes as per the borehole monitoring programme, this includes rest water levels and water quality;	– Environmental audits and inspections – Groundwater monitoring programme – Surface water monitoring programme	– Operational Mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Surface water monitoring when applicable, especially during and after rainfall events; – Regular reporting to management if concerns are noted from borehole monitoring or surface water monitoring results that could be related to acid rock drainage; – Where potential acid forming material is identified, this rock should be treated and/or encapsulated and recorded as such; and – Co-disposal on waste rock dumps to have an equal split of filter cake and waste rock deposited per dump.		
Geotechnical	Erosion controls not adequately in place	– Erosion controls to be implemented on stockpiles, especially those that will remain for a long period of time; – Regular inspections to be conducted on stockpiles; and – Co-disposal on waste rock dumps to have an equal split of filter cake and waste rock deposited per dump, this will ensure the	– Environmental audits and inspections – Area owner inspections	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		height of the dumps are not increased but remain as per initial mine planning calculations.		
Biodiversity	Disturbance outside of approved footprint	– Before preparation and stockpiling activities commence, the area must be assessed to determine if there are any species required to be relocated; – Thereafter topsoil should be stripped (300 mm) and placed in the designated topsoil stockpile; – Berms to be constructed around the perimeter of the stockpile to prevent over tipping and disturbance outside of the approved footprint; and – Wildlife of concern to be reported to the Environmental section.	– Environmental audits and inspections – Site establishment process	– Operational mining manager
Non-mineralised waste	Incorrect disposal of waste on stockpiles	– No waste may be disposed of on the WRD's or the ore stockpiles; and – Litter and any waste observed will be collected and disposed of at the correct waste cell or in a waste receptacle provided.	– Environmental audits and inspections – Area owner inspections	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Mine closure	Incorrect waste rock dump construction resulting in stability issues at closure	- WRD construction will be according to Navachab Gold Mine standards; and - WRD will only be constructed once sterilisation drilling has been done.	Mine planning	Operational mining manager
Rehabilitation	- No rehabilitation plan in place resulting in impractical requirements at mine closure - A lack of progressive rehabilitation and failure to revegetate the landforms	- Develop a rehabilitation plan and implement the requirements stipulated therein; - Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; - Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; - Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required;	- Mine closure plan and closure schedules - Rehabilitation monitoring based on rehabilitation plan	- Operational mining manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Navachab to determine a timeline, based on life of mine planning, when WRDs (dormant, co-disposal or active) are required to be closed; – Geotechnical test work to be conducted on selected waste rock dump soil samples; and – Vegetation survey of adjacent local environment to be conducted, per structure (WRD) to determine what vegetation to be re-introduced in advance of planned re-vegetation.		

2.11 DOMAIN 7: PROCESSING PLANT

This domain includes tasks for the processing plant activities, which are mapped below (where possible):

- Overall gold processing plant infrastructure (CIP), support infrastructure and ponds;
- New 10 000 m³ raw water storage pond;
- Brick processing plant;
- Upgraded gravity feed plant; and
- Run of life of mine (ROM) and crusher(s) (includes reload crusher).

The overall domain manager is the processing manager.

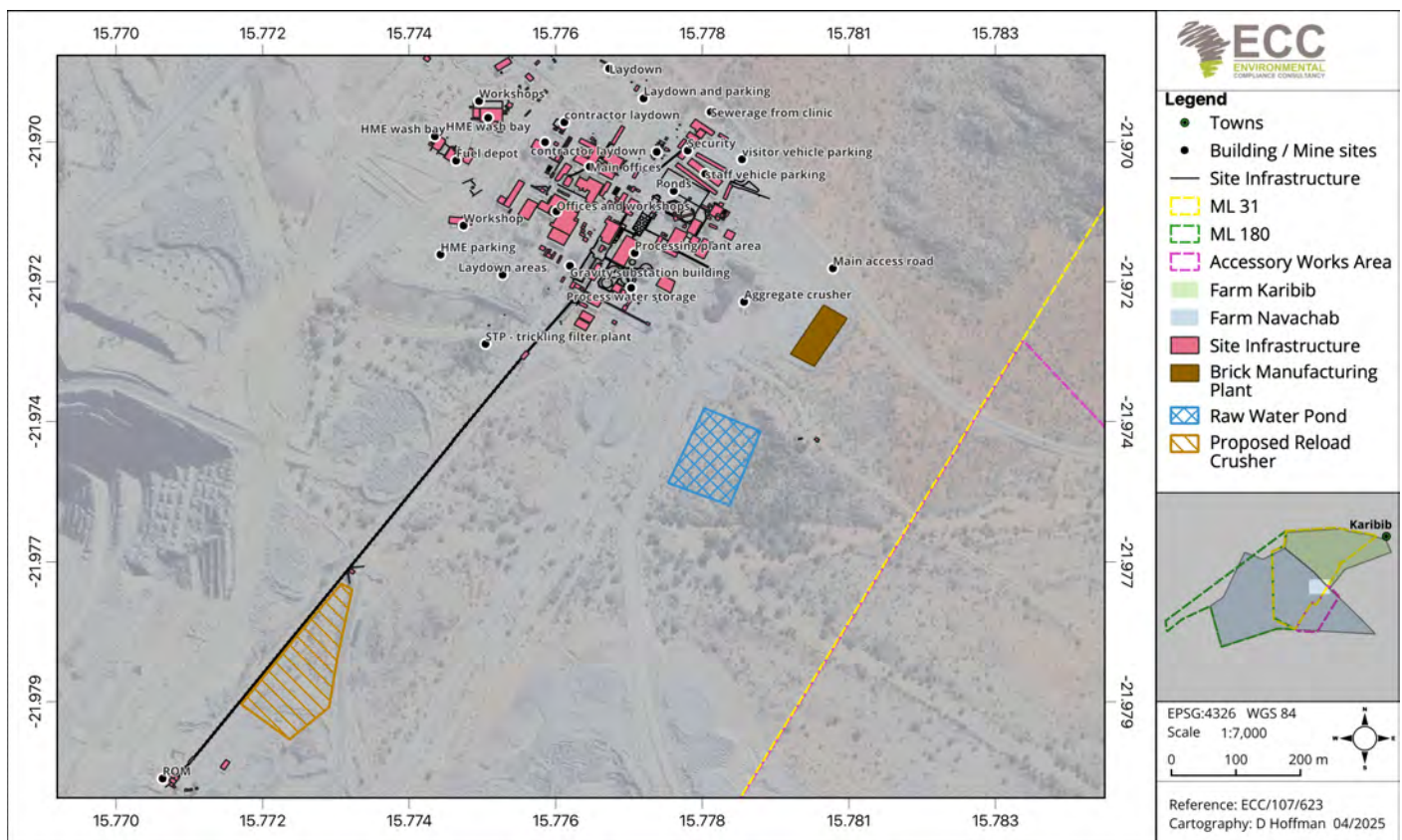


Figure 8 - Domain 7 map depicting the processing plant and ROM locations

Table 8 – Environmental management plan for Domain 7; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Training and awareness	Lack of environmental knowledge on OEMP requirements leads to environmental incidents	– Area specific induction required before entering and working in the plant; – Visitors to be accompanied and supervised at all times; – Environmental section to provide weekly information regarding environmental issues of concern; – Line management to discuss topics with teams; – SHE representatives will be employed by contractor staff to brief staff on their company HSE topics and those of Navachab; – Awareness will be distributed by various channels as deemed appropriate; – Daily site inspections to ensure SHE requirements are adhered to; – SHE files to be maintained per shift as per Navachab requirements; – Staff involved in the transport, handling and storage of hazardous chemicals	– Environmental audits and inspections – Training records	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		to be competent and trained therein and know how to handle accidental releases; and Incident reports covering OHSE to be included, including lessons learned and corrective actions.		
Stormwater management	Flood risks to surface infrastructure, property and personnel and water quality issues related to pollution sources within drainage lines from the PCP plant	- For the PCP plant, it is recommended to place the plant outside of flood lines of the river channel; - Bunds are required to be erected along the PCP plant edge closest to the drainage line for additional flood protection; - As per the 2023 SWMP, a dirty water diversion (channel and berm) is to be constructed east of the processing plant (J30), flowing northwards to collect at J32, and further flow northwards to a final disposal point of J45; - A clean water diversion (channel and berm) is required south of the plant, commencing with J10, flowing westwards to J12. From the confluence of J09 and	- Environmental audits and inspections - Stormwater management plan - Survey database - Stormwater monitoring programme	Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		J10, the diversion will be piped to J12; – There is a natural drainage line that runs along the perimeter of the reload crusher. Ensure that the reload crusher infrastructure does not disturb the drainage line and if this is not avoidable, then incorporate stormwater controls to redirect the clean water flow; – Berms to be placed on the reload crusher perimeter to prevent mixing of clean and dirty water; and – Stormwater controls to be implemented for the new raw water storage pond, including a free board installed.		
Air quality	Dust emissions from unpaved roads in the CIP	– Pave or interlock all roads, where feasible; – Dust suppression and maintenance to be conducted on a regular basis on unpaved surfaces, Dust suppression can either be through water sprays or a chemical dust suppressant binding agent; and	– Environmental audits and inspections – Air quality monitoring programme and results	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		Depositional dust monitoring programme to be implemented.		
	Air pollution or dust emissions from the crusher(s), Argo and PCP plant	- The PCP plant is an important contributor to atmospheric pollutants and the wetting of the ore before crushing is not sufficient, even at 50 % control efficiency; - It is recommended to enclose the PCP and primary crusher; - Enclosure control efficiencies include cyclone (65 %), scrubber (75 %) and fabric filters (83 %); - Regular dust suppression on the roads at Argo and PCP should be implemented through water sprays or a chemical dust suppressant binding agent; and - Ensure dust suppressant measures are implemented at the reload crusher during all operational activities.	- Environmental audits and inspections - Air quality monitoring programme and results	Processing manager
	Air pollution or dust emissions from material handling points	Dust suppression controls are required during material handling;	- Environmental audits and inspections - Air quality monitoring	Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Main areas include the loading point at the crusher and tip point at the secondary crusher silo; and – Emissions can be reduced by water sprays (50 – 70 % control efficiency) or enclosure with bag filters (90 % control efficiency)	programme and results	
	Dust emissions from conveyors and ROM	– Dust suppression controls are required during operation of conveyors and at the ROM; and – Where possible this should be with water sprays, chemical binding agent or covered.	– Environmental audits and inspections – Air quality monitoring programme and results	– Processing manager
	Air pollution from the cyanide-controlled burn area	– The area should be enclosed, remain locked and strict access control requirements implemented; – Air quality monitoring campaign to be conducted on a monthly basis which includes dust fall out and PM_{10/2.5} measurements; – Air quality controls to be implemented to reduce dust plumes; and – Waste to be disposed of correctly as	– Environmental audits and inspections – Air quality monitoring programme and results	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		hazardous waste at a registered offsite facility.		
	Air pollution and dust emissions from the interlock brick manufacturing plant	– Filter cake and dense media separation reject materials will be as wet as possible through implementing dust control measures during the manufacturing of interlocks (8000 interlocks expected per 9-hour shift); – If compressed air is used, additional dust dispersion deterrent measures must be implemented (shields, nets, no outside activities etc.); – Staff members will utilise the correct PPE during operations of the plant; – Interlocks will be heated, dried, stored, handled and transported by forklifts to the final destination in the plant or sold to external third-party stakeholders; – Equipment, power supply utilised and machinery used in the plant will be checked daily and maintained according to	– Environmental audits and inspections – Air quality monitoring programme and results	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		manufacturing specifications; and – Depositional dust emissions will be monitored through the existing air quality monitoring network.		
Housekeeping	Littering, pollution of soils and/or injuries	– Work areas to be maintained in a clean, orderly and presentable condition at all times; – All windblown waste and waste generated to be removed before end of shift or during allocated waste removal cycles; – Stacking and storage to be in order to prevent trip, slip and fall hazards and from animals nesting; – Housekeeping to be conducted throughout and at the end of each shift; – Items that can become easily windblown to be tied down/contained; – Stockpiled sludge should be returned into processing cycle as soon as practically possible; and – Regular inspections by supervisor, line manager and/or manager.	– Environmental audits and inspections – SHE inspection checklists	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Waste management (non-mineralised) hazardous and non-hazardous waste	Littering and pollution of soils/groundwater	– Litter generated during shift must be collected in the waste receptors provided; – Waste must be separated at source as per the waste management procedure in the correct colour coded bins and/or skips; – Bins and skips must have lids, that can seal and are scavenger/baboon proof; – No waste may be burnt or buried on site, apart from remaining paper, plastic, boxes and food waste at the waste site; – No fires will be allowed on site, unless in approved designated areas allowed by the technical services manager; – Domestic waste is disposed of weekly at the non-mineralised waste site; and – Hazardous solid waste created including empty containers, hydraulic pipes, oil filters (etc.) should be removed from site and disposed of at a	– Environmental audits and inspections – Waste records/register – Safe disposal certificates	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		suitable registered hazardous waste facility; – A copy of the safe disposal of these wastes to be maintained as a record on file and provided to the Environmental section on request; – Cyanide waste is burnt at the cyanide burning area in the processing plant under the Ministry of Health and Social Services (MoHSS) exemption permit; – Used oil to be stored either in a bunded area or in drip trays with sufficient capacity to contain a leak (110 %) of volume; – Small and redundant items that have been scrapped (e.g. wood, conveyor belt etc.) to be sold on tender to employees and Karibib residents; – All hydrocarbons, including waste, should be stored inside of a bunded area, and all spills should be treated in accordance with the Navachab hydrocarbon waste		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		management procedures; and – Ensure that any equipment used in the in the gold gravity feed plant (e.g. used screens, shaking tables, jigs, sluice boxes, conveyors etc.) no longer required to be used or damaged are cleaned before stockpiled for disposal.		
Chemical and process effluent handling, storage and management	Incorrect chemical management can lead to soil and groundwater contamination or injury/mortality to fauna and flora	– A chemical file is kept by each area supervisor and/or contractor SHE representative; – All chemicals used on site, including their MSDS, is to be available in these files; – Copies of MSDS's to be provided to the Environmental section; – Environmentally friendly chemical products should be considered over hazardous chemicals; – Sufficient drip trays should be made available to capture leaks and prevent pollution; – Chemical containers either to be stored in impermeable bunds, drips trays or other	– Environmental audits and inspections – Chemical files – Incident reports – Groundwater monitoring	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		secondary containment devices (110 % of largest volume); – If 1-ton bags are used for reagent storage, consider storing bags under a roof or cover to prevent sun damage and rainfall infiltration, which in turn can results in cross contamination or spills; – Spill kits and spill absorbent treatment material to be present in the various processing work areas; – Incident reports to be compiled for each spill event as per the incident management procedure; – If surface and near surface related discharges occur from the processing plant, the mine will monitor the water discharge quality; – Ensure that bunds are designed to contain 110% of the volume of the largest processing tank constructed therein and that pumps and pipes are maintained in good working order;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– If feasible, pipelines and pipe racks to be underlain with supporting concrete trenches to catch potential released effluent from pipe ruptures or leaks; – Major spillage incidents will be handled in accordance with the emergency response procedure; – Monthly groundwater monitoring of rest water levels and water quality for early pollution detection; – Report areas of concern with the groundwater network to management timely for corrective action to be taken, if required; – Daily inspections of work areas; – Monitor effectiveness and stability of structures (e.g. concrete), pipelines/pipe racks, pumps and cable racks and liners for leaks; and – Process effluent water to be contained and reused in the process circuit, where feasible.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Domestic effluent water management	Lack of appropriate ablution facilities can result in soil contamination and pollution	– Only approved ablution facilities to be utilised; – If additional ablution facilities are required, the Environmental section to be informed; – No employee or contractor on Navachab site 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; – Septic tanks to be pumped out on a regular basis to avoid overflows; – Grey water to be separated from effluent water and be reused; and – Regular effluent water quality samples to be taken by the Environmental section.	– Environmental audits and inspections – Effluent monitoring programme	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Raw water storage pond(s) management	Incorrect design of ponds could lead to structure failure and loss of water	– The raw water storage pond will be sealed using a high-density polyethylene (HDPE) lining; – Regular inspections will be carried out to determine integrity of the liner, support infrastructure and potential loss of water; and – Inflow from NamWater reservoir will be monitored using flow metres.	– Environmental audits and inspections – Daily inspections by processing team	– Processing manager
Biodiversity	Incorrect management of ponds	– Ponds should be fenced to prevent larger wildlife from gaining access; – Bird deterrent measures should be investigated to keep avifauna away from ponds; – Ponds should have freeboards to prevent overflows into the natural environment (1:100 year flood event), which can attract wildlife, causing pooling water or even erosion concerns; – Animals of concern active around the pond should be reported to the Environmental section; and	– Environmental audits and inspections – Incident records	– Processing manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		All related animal injuries or mortalities should be reported immediately to the Environmental section and an incident report compiled.		
	Disturbance to fauna and flora from clearing of new areas	- The OHSE department to be informed in advance (10 – 14 days) of any new areas required to be cleared for processing operational activities; - The OHSE department will scope if the activity requires an ESIA and new ECC or ECC amendment; - If the new activity is a listed activity as per the EMA and associated regulations, an ESIA assessment to be undertaken for the specific required activity; - If protected vegetation is required to be cleared, a tree harvesting permit to be acquired from MEFT before the activity may take place; - Consider the importance of preserving wildlife and ecology throughout this	- Environmental audits and inspections - Rehabilitation Plan	- Processing manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		project clearing phase, by ensuring that all precautions are taken into consideration and have as little harmful impacts as possible; – Protected vegetation will be identified and avoided; – Relocation of important fauna and flora species to be conducted before clearing commences, with the support of a specialist, if required; – Topsoil to be removed and stockpiled as per the rehabilitation plan; and – Stockpiles will be managed in such a way to ensure they are not impacted upon, are not susceptible to erosion and designed in such a manner to promote the survival of the seed banks.		
Noise and vibration	Noise and vibration impacts on employees	– Occupational noise monitoring campaigns to be conducted on an annual basis by the OHSE department; – Bi-annual noise monitoring; – Employees to be issued with ear protection, where required;	– Environmental audits and inspections – Occupational noise monitoring programme	– Processing manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Pre-start checks to be conducted daily on equipment; and – Equipment to be serviced and maintained on a regular basis.		
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate the landforms	– Develop a rehabilitation plan and implement the requirements stipulated therein; – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and – Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required.	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Processing manager – Technical services manager

2.12 DOMAIN 8: WORKSHOPS AND LAYDOWN AREAS

This domain includes tasks for workshop and laydown area activities, which are mapped below (where possible):

- HME workshop;
- MME workshop;
- Existing explosives magazines and proposed magazine;
- Engineering workshop;
- Processing workshop;
- Contractor workshop; and
- Laydown areas.

The overall domain manager is the operational mining manager.

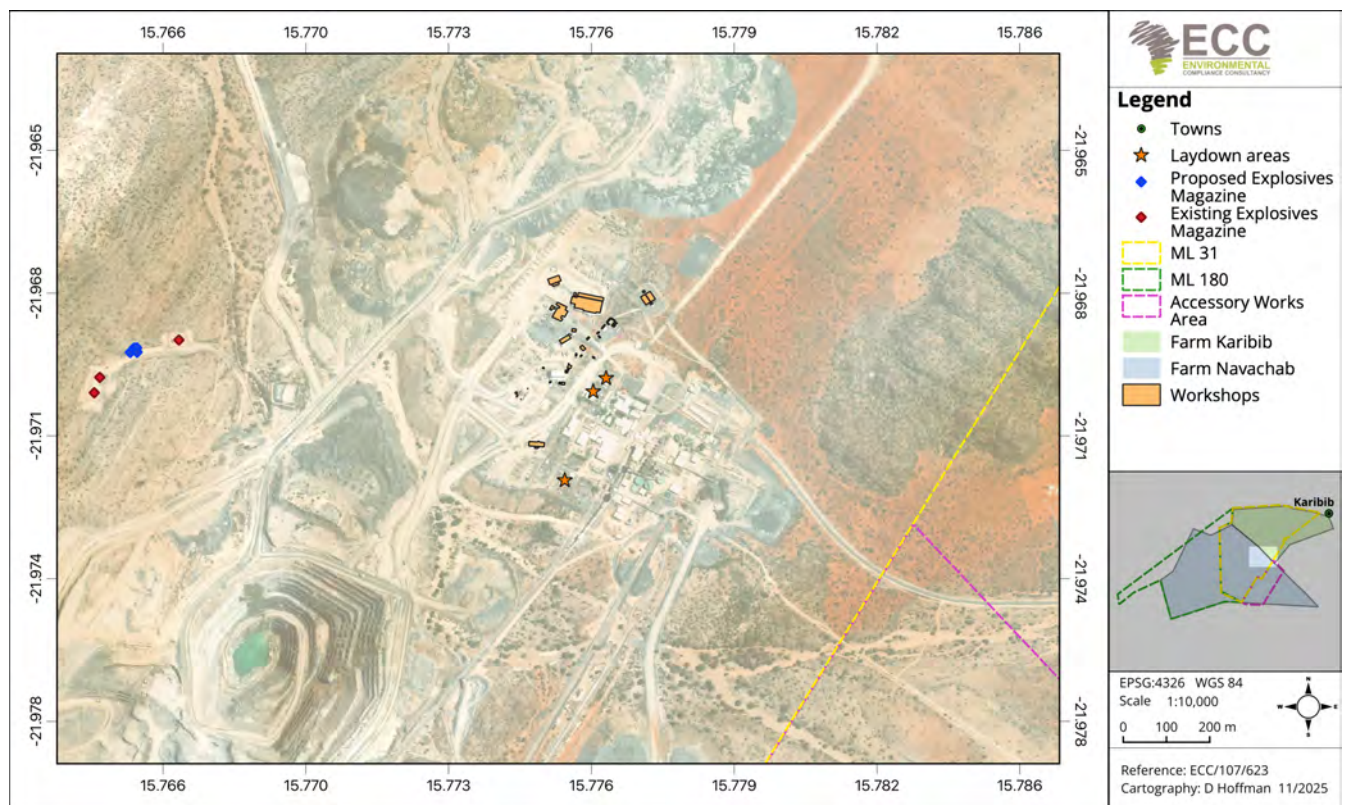


Figure 9 - Domain 8 map depicting the workshops and laydown area locations

Table 9 – Environmental management plan for Domain 8; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Site establishment	Site clearing without approval	– Land clearing and disturbance may only start after the internal sign-off on the site preparation has been done and the land clearing permit has been obtained MEFT Omaruru Forestry office; – If topsoil is required to be removed, vegetation must be cleared with the topsoil (300 mm) in bund walls around the construction site or to the nearest dedicated topsoil stockpile; – Construction sites must be clearly demarcated with the use of coloured pegs; – Sensitive areas (e.g. protected vegetation) to be demarcated with appropriate demarcation tape; – Disturbance to be restricted to approved areas only; and – Where areas have been unnecessarily disturbed, these will be immediately rehabilitated.	– Environmental audits and inspections – Site preparation permit	– Operational mining manager – Technical services manager
Housekeeping	Littering, pollution of	– Workshop and laydown areas to be maintained in a clean,	– Environmental audits and inspections	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	soils and/or injuries	orderly and presentable condition at all times; – Stacking and storage to be in order to prevent trip, slip and fall hazards and from animals nesting; – Housekeeping to be conducted throughout and at the end of each shift; – Items that can become easily windblown to be tied down/contained; and – Regular inspections by supervisor, line manager and/or manager.	– SHE inspection checklists	– Technical services manager
Waste management (non-mineralised) hazardous and non-hazardous waste	Littering and pollution of soils/ground water	– Litter generated during shift must be collected in plastic bags and/or stored directly in the waste receptors provided; – Waste must be separated at source as per the waste management procedure in the correct colour coded bins and/or skips; – Bins and skips must have lids, that can seal and are scavenger/baboon proof; – No waste may be burnt or buried on site, paper, plastic, boxes	– Environmental audits and inspections – Waste records/register – Safe disposal certificates	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		and food waste at the waste site must be removed by the registered waste contractor; – No fires will be allowed on site, unless in approved designated areas allowed by the technical services manager; – Domestic waste is disposed of weekly at the non-mineralised waste site; – Hazardous solid waste created including empty containers, hydraulic pipes, oil filters (etc.) should be removed from site and disposed of at a suitable registered hazardous waste facility. Storage of hazardous waste should be in adequately bunded containers and on an impervious surface to prevent soil contamination; – A copy of the safe disposal of these wastes to be maintained as a record on file and provided to the environmental section on request; – Medical waste will be taken to Walvis Bay		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		landfill site for incineration; – Cyanide waste is burnt at the cyanide burning area in the processing plant under the Ministry of Health and Social Services (MoHSS) exemption permit; and – Soil contaminated by hydrocarbons should be contained, cleaned and stored in adequately bunded containers. Contaminated material should be stored on an impervious surface at the HME wash bay or the bioremediation site, before removal from site to a registered hazardous waste treatment facility		
	Incorrect waste streams (salvageable) to landfill	– Scrap metal to be collected in dedicated bunded areas and the Environmental section informed when collection is required; – Vehicle batteries to be collected and removed to scrap dealers; – Tyres to be collected and removed to scrap dealers; – Bulk plastic drilling bags to be collected and removed to plastic recycling companies;	– Environmental audits and inspections – Waste records/register – Safe disposal certificates	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Used oil to be collected in oil drums and brought to the HME used oil recycling facility when full; – Used oil to be stored in adequately bundled containers. Where applicable, drip trays with sufficient capacity should be used to contain leaks (110 %); – Permit to be acquired from Ministry of Industries, Mines and Energy (MIME) for the storage and selling of used oil on site; – Small and redundant items that have been scrapped (e.g. wood, furniture, conveyor belt etc.) to be sold on tender to employees and Karibib residents; and – Soil contaminated by hydrocarbons should be contained, cleaned and stored in adequately bundled containers. Contaminated material should be stored on an impervious surface at the HME wash bay or the bioremediation site, before removal from site to a registered hazardous waste treatment facility		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Chemical handling, storage and management	Incorrect chemical management can lead to soil and groundwater contamination or injury/mortality to fauna and flora	– A chemical file is kept by each workshop and laydown area supervisor and/or contractor SHE representative; – All chemicals used on site, including their MSDS, is to be available in these files; – Copies of MSDS's to be provided to the Environmental section; – Environmentally friendly chemical products should be considered over hazardous chemicals; – Sufficient drip trays should be made available to capture leaks and prevent pollution; – Chemical containers either to be stored in impermeable bunds, drip trays or other secondary containment devices; – Spill kits and spill absorbent treatment material to be present in the workshops and laydown areas; and – Incident reports to be compiled for each spill event as per the incident management procedure.	– Environmental audits and inspections – Chemical files – Incident reports	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Soil and groundwater management	Lack of spills and hydrocarbon management (spill control and prevention) can lead to soil and groundwater contamination or injury/mortality to fauna and flora	– All hydrocarbon materials and containers must be stored correctly, in drip trays or in bunded areas that are impermeable and can contain 110 % of largest volume; – All hydrocarbon containers when transported must be stored in a drip tray and secure from falling over; – Spill kits and spill absorbent treatment material to be present in the workshops and laydown areas; – Teams must be trained on how to use spill kits and how to implement correct spill management controls; – All vehicles, HME and equipment must be serviced on an impermeable surface, such as a workshop concrete floor or liner to prevent leaks and spills; – All spills to be cleaned up within the same shift and an incident to be recorded, where required; – Waste receptacles for hydrocarbon waste to be provided, leak proof	– Environmental audits and inspections – Incident reports	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		and sufficient in quantity; – Soil contaminated by hydrocarbons should be contained, cleaned and stored in adequately bunded containers. Contaminated material should be stored on an impervious surface at the HME wash bay or the bioremediation site, before removal from site to a registered hazardous waste treatment facility; and – Sumps should be installed in workshops with an oil and water separator.		
Domestic effluent water management	Lack of appropriate ablution facilities can result in soil contamination and pollution	– Only approved ablution facilities to be utilised; – If additional ablution facilities are required, the Environmental section to be informed; – No employee or contractor on Navachab site may relieve themselves in the surrounding environment and work area; – Ablution facilities to be cleaned and maintained on a regular basis;	– Environmental audits and inspections – Effluent monitoring programme	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– 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; – Septic tanks to be pumped out on a regular basis to avoid overflows; – Grey water to be separated from effluent water and be reused; and – Regular effluent water quality samples to be taken by the Environmental section.		
Explosives magazine/storage	Hydrocarbon spills during the construction of the third explosive magazine may contaminate nearby surface water bodies and drainage lines	– All hydrocarbon materials and containers must be stored correctly, in drip trays or in bunded areas that are impermeable and can contain 110 % of largest volume; – All hydrocarbon containers when transported must be stored in a drip tray and secure from falling over – Spill kits and spill absorbent treatment material to be present for quick reaction times to handle small and large spills;	– Regular inspections and audits – Chemical files – Incident reports	– Operational mining manager – Technical services manager – Legal appointment of blaster

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Incident reports to be compiled for each spill event as per the incident management procedure; – Should a temporary satellite refuelling bay be needed for construction of the third explosive magazine established near the construction site, the fuel tank should be positioned in order to facilitate quick refuelling of equipment and machinery whilst construction is ongoing; – The satellite refuelling bay should be properly bunded to reduce the risk of fuel discharged to the environment; – Traces and spills of hydrocarbons observed from daily inspections should be cleaned up and be removed immediately; and – Soils to be treated in situ and where this is not possible, soils to be removed to the bioremediation facility for further treatment or treated soil should be removed from the mine site to a registered hazardous		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		waste treatment facility.		
	Incorrect management, handling and storage of explosives	– The Blasting Chief Inspector from MIME to conduct an initial inspection and from thereon annually, to ensure provision with the Explosives Act, No. 26 of 1956, for the correct storage, handling and management of explosives; – Explosives to be stored at a safe predetermined distance from any emulsion; – Personnel handling explosives will be competent and trained to do so and know what to do in the case of accidental spillage; and – No cell phones or electronic devices to be used around explosives unless authorised by the legal appointed blaster.	– Inspections and engagement by mining manager – Training records	– Operational mining manager
	Land clearing and vegetation loss may result in the colonisation of the area by alien	– Develop and implement an invasive species management plan outlining prevention, early detection and control procedures for alien species during	– Environmental audits and inspections – Alien invasive species monitoring programme – Assess pre-construction	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	invasive plant species	- construction and operations; – Conduct a pre-construction survey to identify existing invasive species and sensitive native vegetation to inform site-specific management actions; – Strip, store and re-use topsoil separately to prevent contamination with invasive plant material or seeds; – Conduct environmental induction sessions to educate workers on identifying invasive species and the importance of preventing their spread; and – Limit vegetation clearing strictly to designated areas to minimise soil exposure and disturbance.	- survey against vegetation colonisation of the area post construction to monitor invasive species – Inspections and engagement by mining manager – Training records	
	Fire or emergency incident in the explosives magazine could result in the generation of nitrate and hydrocarbon-rich	– Store explosives at regulated safe distances from potential emulsions; – Prohibit unauthorised electronic devices near explosives; – Ensure only trained and competent personnel handle explosives and respond to spillages;	– Routine inspections and engagement by mining manager – Incident logs – Training records – Emergency and stormwater management plans	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	leachates which may infiltrate through runoff and subsequently contaminate groundwater resources	– Fire prevention and control: construct the magazine with non-combustible, fire-resistant materials, proper ventilation, and compliant design; install automatic fire detection and alarm systems; – Use dry chemical or foam-based suppression (not water); – Maintain portable fire extinguishers; – Implement and regularly update a site-specific Emergency Response Plan (ERP) covering fire, runoff and groundwater protection; – Conduct regular fire and spill drills; – Maintain an on-site emergency response team with suitable equipment; – Install impermeable flooring, bunding, low-permeability liners, and sealed drainage systems with shut-off valves; – Direct runoff to containment sumps; – Use spill berms, hydrocarbon traps, and absorbents in high-risk areas;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Conduct routine inspections, groundwater quality and hydrogeological monitoring, and maintain incident logs; treat contaminated water before disposal; and promptly report incidents to relevant authorities (MIME, MEFT); and – Perform contamination assessments, apply appropriate remediation (e.g., pump-and-treat or bioremediation), rehabilitate affected ecosystems, and review and update emergency and stormwater management plans.		
	Potential stormwater contamination from flooding of the ANFO explosives magazine	– Strengthen and maintain stormwater diversion berms and drainage systems to handle extreme rainfall events; – Line or seal pollution control dams (PCDs) and containment ponds to prevent seepage and overflow; – Increase storage capacity and provide emergency overflow containment for large storms;	– Routine inspections and engagement by mining manager – Incident logs – Training records – Emergency and stormwater management plan	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Maintain strict housekeeping in the magazine yard to prevent spillage or residues; – Conduct regular water quality monitoring for nitrates, sulphates and TDS in groundwater and surface water; – Inspect drainage, berms and PCDs routinely, especially after heavy rainfall events; – Update and implement an Emergency Response Plan with overflow and containment procedures; – Train staff in spill response and emergency containment; and – Implement immediate cleanup, sampling and remediation following any overflow or contamination incident.		
	Hydrocarbon spills at the explosives magazine may contaminate nearby surface water in nearby	– Construct the third magazine with impermeable flooring, bunding and sumps to contain spills; – Maintain separation of clean and dirty stormwater and regularly inspect containment systems;	– Routine inspections and engagement by mining manager – Incident logs – Training records – Emergency and stormwater	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	drainage lines during operations	– Implement strict handling and storage procedures for explosives and hydrocarbons; – Keep spill kits on-site and train staff in immediate spill response and cleanup; – Monitor water quality (nitrates, ammonia, hydrocarbons) in nearby drainage lines; – Ensure routine inspections and maintenance of drainage and containment structures; – Dispose of contaminated materials adequately; and – Rehabilitate affected areas and review management plans after any incident.	management plan	
	Increased contaminant load in surface water runoff due to a hydrocarbon spill at all three explosive magazines	– All magazines must have impermeable floors, bunding, and sumps to contain spills; – Install stormwater diversion structures to prevent clean runoff from mixing with contaminated areas; – Add redundant containment systems to handle combined spill scenarios;	– Routine inspections and engagement by mining manager – Incident logs – Training records – Emergency and stormwater management plan	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Implement strict handling protocols for hazardous materials; – Regular stormwater quality monitoring for hydrocarbons and nitrates; – Routine inspections and maintenance of containment and drainage systems; – Develop an integrated spill response plan for all three magazines; – Provide spill response kits and train personnel in emergency procedures; – Conduct spill response drills regularly; – Maintain buffer zones (vegetation or physical barriers) between the magazines and drainage lines; – Use land grading to prevent runoff from flowing directly into rivers; – Conduct cumulative risk assessments every 2 years or after major events; – Update the stormwater management plan to reflect increased risk from multiple magazines; and – Ensure full compliance with national environmental and		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		hazardous materials regulations.		
	Improper management of sewage and greywater from construction of the explosive magazine wastewater facilities e.g. portable toilets can introduce pathogens and organic matter into subsurface and surface water systems, polluting drainage lines and surface water bodies	– Only approved ablution facilities to be utilised; – If additional ablution facilities are required, the Environmental section to be informed; – No employee or contractor on Navachab site 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; – Septic tanks to be pumped out on a regular basis to avoid overflows; – Grey water to be separated from effluent water and be reused; and – Regular effluent water quality samples to be taken by the Environmental section.	– Environmental audits and inspections – Effluent monitoring programme	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Destruction of heritage/Archaeological artifacts and sites	– Environmental section to conduct a detailed archaeological and heritage survey of the construction area to prior to clearing activities taking place to determine if there are potential sites of concern. If potential sites are identified, the sites to be demarcated and an archaeological specialist to be contacted to conduct a site visit to determine significance of sites; – Implement the chance find procedure outlining steps to follow if previously unknown artifacts or features are discovered during construction; – Establish exclusion zones around identified heritage sites to prevent accidental disturbance; – Limit excavation to areas already cleared by surveys; use hand tools in sensitive areas to minimise disturbance; – Provide construction personnel with training on identifying heritage materials and following	– Environmental audits and inspections – Archaeological monitoring programme	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		the chance find procedure; – Optimise the layout of infrastructure to avoid sensitive areas where possible; – Record and where appropriate, remove and preserve artifacts discovered during construction; – Restore disturbed areas as much as possible, including backfilling trenches and re-vegetation, while maintaining any preserved heritage features; – Implement ongoing monitoring for any delayed impacts on heritage features and report findings to the relevant heritage authorities; – Obtain necessary approvals and comply with the National Heritage Act, No. 27 of 2004 and local heritage authorities before commencing construction; and – Engage with relevant heritage authorities and local communities to ensure culturally sensitive management of heritage artifacts.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Accidental detonation of explosive magazine/s	– Ensure that the proposed magazine meets recognised standards (e.g., South African Explosives Regulations, IME or ATF magazine standards) with reinforced walls, blast venting and roofs designed to direct energy away from personnel; – Store detonators, boosters and main charge explosives separately to prevent sympathetic detonation; – Restrict magazine access strictly to trained and authorised personnel; – Implement sign-in/out procedures, security fencing and surveillance; – Maintain clear SOPs for handling, transport and storing explosives, including step-by-step guidance for loading, unloading and inspection; – Conduct routine inspections for magazine integrity, moisture ingress, pest control and potential ignition sources; – Develop detailed response plans for	– Routine inspections and by mining manager – SOP on explosives handling and storage – Explosives stock inventory – Incident logs – Training records	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		accidental detonations, including evacuation routes, first aid and medical response for blast-related injuries; – Ensure personnel wear flame-retardant clothing, safety helmets and eye protection when handling explosives; – Continuous training in explosive handling, emergency procedures, blast physics awareness and recognition of high-risk conditions; – Use blast-proof containers and restricted transport routes when moving explosives between magazines and working faces; – Maintain accurate explosive stock records, implement first-in-first-out (FIFO) procedures, and minimize on-site quantities to reduce potential blast load; – Install blast overpressure and vibration sensors around magazines to detect any unusual events or structural stress; – Audible and visual alarms to alert		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		personnel of a potential detonation risk or emergency evacuation; – Conduct regular emergency drills simulating accidental detonation to ensure rapid, orderly response; and – Any near-miss or minor detonation incident should trigger a detailed investigation and SOP update to prevent recurrence. – Avoid storing unnecessary quantities; use less sensitive explosive types where feasible; – Provide segregation between different explosive types and incompatible materials (e.g., oxidisers, fuels); – Ensure magazine foundations and roofing prevent water ingress and minimise temperature fluctuations; – Install anti-static flooring and conductive fittings; ensure proper bonding and earthing of the structure and stored packages; – Control ventilation to prevent accumulation of fumes while		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		avoiding introduction of ignition sources; – Implement lightning protection (surge arrestors, proper grounding) and ensure external conductors are routed safely; – Strictly limit access: issue keys/cards only to authorised, trained personnel; keep accurate access logs; – Ensure no smoking signs and strict controls enforced; – All battery sources that have the potential to cause an ignition to be locked in a safe box or cage locate outside the magazine area before entry; – The necessary signage (safety and designates blaster contact information) to be placed around the magazine; – Intrusion detection, CCTV monitoring 24/7; – Vehicle exclusion zone immediately around magazine; designated routes and parking for authorised vehicles only; – Prevent water pooling and damp conditions that could create hazardous reactions;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Implement SOPs, two-person rule for critical tasks and regular staff training on handling and emergency response; – Conduct regular structural, electrical and environmental checks, monitor temperature/humidity and inspect explosives; – Maintain response plans, equipment, evacuation procedures and liaise with local emergency services; – Implement real-time hazard communication systems to alert personnel immediately in case of any incident – Keep MSDS, permits, compliance records and perform regular audits; and – Construct reinforced earthen berms, blast walls or mounded magazines designed to deflect overpressure and debris away from access routes and power installations; – Establish independent backup generators or solar-battery hybrid systems located away from the magazine site to ensure uninterrupted power for emergency lighting,		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		ventilation and communication systems; – Install dual communication systems (e.g., radio network and fiber link or satellite backup) with separate routing paths to maintain connectivity, if primary systems are damaged; – Develop and maintain secondary access roads or emergency bypasses that remain clear of the magazine’s potential blast radius to ensure continued access for emergency vehicles; – Define and clearly mark exclusion and safety zones around the magazine using GIS-based blast modeling to inform route planning, signage and vehicle restrictions; – Install automatic fire detection (thermal and smoke sensors) and video surveillance systems linked to the mine’s central control room; – Enforce strict “no smoking/open flame” zones, control access with biometric or RFID		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		systems, and maintain clear signage; – Conduct routine integrity checks on electrical connections, lightning protection and grounding systems to prevent accidental ignition – Thoroughly document the sites (photographs, 3D scanning, mapping) before construction.		
	Noise from construction and operation of the explosive magazine on the health and safety of employees and contractors (resulting in noise-related health impacts)	– Maintain and service machinery to reduce noise; – Rotate shifts and schedule tasks to limit exposure time; – Provide noise awareness training and clear signage for high-noise zones; – Use visual alarms where required; – Require earplugs or earmuffs; use dual protection for extreme noise; – Ensure proper fit and training on correct use; – Conduct baseline and periodic hearing tests; – Monitor stress and cardiovascular health; provide quiet rest areas; – Train workers on safe responses to unplanned detonations;	– Routine inspections and engagement by mining manager – Incident logs – Training records – Bi-annual noise monitoring	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Use visual alarms or radios for communication in noisy areas; and – Implement regular noise monitoring and feedback systems. – Clearly mark high-noise zones and provide visual or vibration-based warning signals for critical alerts where auditory communication may be impaired; – Educate workers on the risks of noise exposure, safe work practices and proper use of hearing protection devices; – Ensure PPE is correctly fitted, maintained, and replaced as necessary to maintain effectiveness – Schedule controlled blasts during less sensitive periods (daytime) to minimise exposure to workers; – Use delayed blasting techniques or reduced charge sizes where feasible to reduce peak noise and vibration; – Position noisy equipment away from worker congregation areas or sensitive locations on-site;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Monitor both LAeq (average noise levels) and LAFmax (peak noise levels) to identify risks in real-time; – Investigate and address any exceedances promptly; – Notify local communities of planned noisy activities in advance; – Provide mechanisms for reporting noise complaints and responding promptly; and – Manage reversible stress and sleep disturbance through scheduling and temporary respite areas away from noisy zones. – Monitor worker fatigue and stress levels to mitigate indirect safety risks caused by noise exposure; – Ensure communication systems remain effective in noisy environments, using visual or electronic alerts when auditory signals may be compromised; and – Use findings from incidents to continuously improve noise control strategies.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Leakage or spillage of hydrocarbon based fluids from machinery or compressors during the construction of the explosive magazine due to improper waste handling can lead to groundwater contamination	– Maintain machinery regularly, store fuels in bunded tanks, and minimise on-site storage; – Conduct refuelling in designated areas with trained personnel and use drip trays or containment mats; – Place drip trays under stationary machinery and portable containment mats during refuelling to capture minor leaks; – Store fuels, lubricants, and other hydrocarbons in bunded tanks or containers with spill containment measures capable of holding at least 110% of the tank volume; – Keep only the minimum necessary quantities of hydrocarbons on-site to reduce the potential spill volume; – Store hydrocarbons away from surface water channels and in areas with low infiltration potential; – Maintain well-stocked spill response kits (absorbents, booms, sandbags, shovels) at key locations, and	– Groundwater monitoring	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		ensure staff are trained in their use; – In the event of a spill, immediately contain and remove the hydrocarbons from soil surfaces before infiltration occurs; – Implement a clear hydrocarbon spill response plan, including notification protocols and responsibilities; – Establish groundwater monitoring points downgradient of the construction area to detect early signs of contamination; – Conduct regular environmental awareness training for all personnel on spill risks and response procedures; – Carry out routine environmental audits to verify that hydrocarbon handling and storage practices comply with best practices; and – Prepare contingency plans for potential in-situ bioremediation or pump-and-treat methods if contamination occurs		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Hazardous wastes including batteries, solvents, paints and chemical containers polluting soil, surface water drainage lines and groundwater	– Store batteries, solvents, paints and chemical containers separately in labelled, bunded, and ventilated areas; – Keep storage covered, shaded, and organised to prevent spills or leaks; – Use secondary containment for all hazardous waste; – Keep spill kits and absorbents nearby; – Use airtight containers for volatile or corrosive chemicals; – Train staff on safe handling and transport; – Follow SOPs for labelling, storage and transfer of hydrocarbons and chemicals; – Recycle batteries through licensed recyclers; – Neutralise acids/bases and dispose of chemicals at licensed hazardous waste facilities; – Avoid disposal in unlined pits or general landfills; – Train staff in spill containment and first aid response;	– Environmental audits and inspections – Incident reports – Groundwater monitoring	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		- Minimise storage duration; remove and treat/dispose of waste promptly; - Decontaminate storage areas at closure;		
	Increased contaminant load in surface water runoff due to hydrocarbon spill at all three (3) explosive magazines	- All magazines must be equipped (designed) with impermeable floors, bunding, and sumps to contain spills. - Install stormwater diversion structures to prevent clean runoff from mixing with contaminated areas; - Add redundant containment systems to handle combined spill scenarios; - Implement strict handling protocols for hazardous materials; - Regular stormwater quality monitoring for hydrocarbons and nitrates; - Conduct routine inspections and maintenance of containment and drainage systems; - Develop an integrated spill response plan for all three magazines; - Provide spill response kits and train personnel in emergency procedures;	- Environmental audits and inspections - Incident reports - Groundwater monitoring	- Operational mining manager - Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Conduct spill response drills regularly; – Maintain buffer zones (vegetation or physical barriers) between the magazines and drainage lines; – Use land grading to prevent runoff from flowing directly into rivers; and – Conduct cumulative risk assessments every two (2) years or after major events; and – Review the requirement to update the stormwater management plan to reflect increased risk from multiple magazines.		
	Disturbance or displacement of fauna during construction	– Conduct a pre-construction ecological survey to identify sensitive fauna habitats and adjust layout if possible. – Provide wildlife awareness training to workers and enforce a no-harm/no-poaching policy. – Ensure an Environmental Control Officer (ECO) is present to oversee clearing and compliance. – Avoid clearing during peak breeding seasons where possible;	–	–

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		conduct nest/burrow checks if work cannot be rescheduled. – Relocate fauna (e.g., tortoises, birds, small mammals, reptiles) through a qualified specialist if encountered during clearing. – Enforce low vehicle speed limits and controlled traffic movement to prevent road kills. – Manage food and waste properly to avoid attracting wildlife. – Prohibit domestic animals (e.g., dogs, cats) on site. – Rehabilitate disturbed areas after construction to restore habitat conditions. – Maintain a fauna interaction register and conduct regular monitoring during construction.		
	Disturbance or displacement of fauna during operation	– Maintain fenced and clearly demarcated magazine area to prevent accidental entry of wildlife. – Keep surrounding vegetation trimmed to discourage nesting, burrowing, or concealment near the magazine walls.	–	–

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Regularly inspect for wildlife presence (e.g., snakes, small mammals, birds nesting in crevices); relocate safely using trained personnel when required. – Enforce a strict no-harm policy relating to wildlife around the magazine area, no trapping, feeding, harassment, or removal except for safe relocation. – Keep doors and ventilation points screened or sealed to prevent animals from entering storage buildings. – Minimise noise, vibration, and unnecessary lighting around the magazine to avoid disturbance and nocturnal fauna displacement. – Use downward-facing, low-intensity / motion-activated lighting to reduce attraction of insects and nocturnal species. – Ensure all food waste and general refuse is stored in wildlife-proof bins and removed regularly to prevent scavenger attraction.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– No water pooling near the magazine, standing water can attract mammals, reptiles, and birds. Maintain proper drainage. – Vehicle speed limits enforced on access roads (e.g., 20–30 km/h) to reduce wildlife collisions. – Routine ECO monitoring to check compliance and record fauna sightings, interactions, or incidents. – Maintain a Fauna Incident Register, documenting any injury, mortality, or relocation events and report in monthly environmental records. – Review and adapt procedures annually or after any fauna-related incident to improve wildlife protection practices. – Engage staff through periodic refresher training on wildlife awareness and safe response procedures around the magazine.		
	Visual disturbance to nearby receptors within a 10	– Earth-tone / non-reflective external finishes on magazine buildings (e.g., beige, tan, brown, stone-grey)	–	–

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	km distance from the	to blend with local rock and soil colors typical of the Erongo landscape. – Keep lighting minimal and directional, using downward-facing, shielded fixtures to avoid light pollution and sky-glow visible at distance – Establish a natural vegetation buffer using indigenous shrubs and low-growing tree species to soften lines of constructed features. – Rehabilitate construction disturbance zones around the magazine with stockpiled topsoil and local seed mix to reintegrate structure into surrounding terrain. – Use berms or low earthen bunds shaped to mimic natural land contours to visually screen magazines from key viewpoints (e.g., farmers, access roads). – Maintain a clear color and texture continuity between magazine roofs and surrounding terrain to reduce contrast. – Limit the footprint of associated		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		infrastructure such as access tracks to prevent the visual widening of the project area. – Minimize dust emissions around the magazine area to avoid creating noticeable dust plumes visible at long distances. – Ensure operational waste and equipment storage areas near the magazine are tidy, contained, and not visually cluttering the landscape. – Periodic inspections of visual mitigation effectiveness, especially from known viewpoints or receptor locations (e.g., B2 road, mine settlement points). – Review visual impacts after vegetation establishment, and if screening remains insufficient, supplement planting or adjust bunding.		
Stormwater management	No dirty water containment controls in place leading to pollution	– Workshops and laydown areas associated with S01 contact water will collect naturally in sump SU01, which is north of the workshops; and	– Environmental audits and inspections – Stormwater management plan – Survey database	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Dirty water will further be channelled south and north/northeast of the site in the diversions discussed in previous domains (J38 and J35 confluence to J43 and J31 to J32 and further northwards). Both diversions will deposit into pollution control pond No. 1.	– Stormwater monitoring programme	
Rehabilitation	– A lack of progressive rehabilitation and failure to revegetate the landforms	– Implement requirements stipulated in the rehabilitation plan; – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and – Final landforms to comply with domain requirements in the rehabilitation plan and any additional	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Operational mining manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		geotechnical and geohydrology study work required.		

2.13 DOMAIN 9: NON-MINERALISED WASTE FACILITY AND BIOREMEDIATION SITE

This domain includes tasks for non-mineralised waste activities, which are mapped below:

- Non-mineralised waste cells; and
- Bioremediation facility.

As of 2025, the current site will need to be closed and rehabilitated, to be used by mining for the continuation of their waste rock dump allocated next to the site. A new site has been proposed where operations will continue. Once the new location is confirmed and operational, Figure 10 will be updated.

The overall domain manager is the technical services manager.

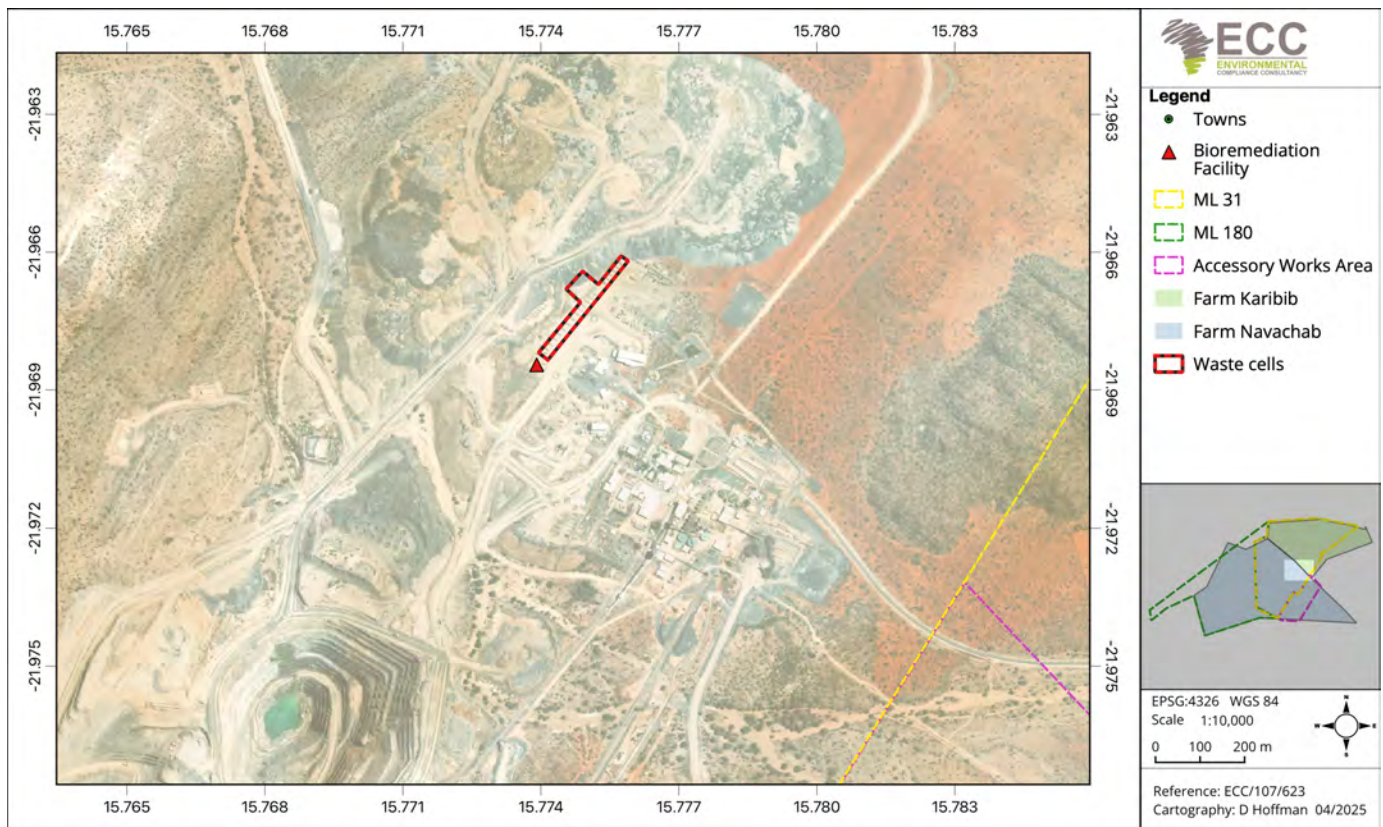


Figure 10 - Domain 9 map depicting the non-mineralised waste and bioremediation site area location

Table 10 – Environmental management plan for Domain 9; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Legal requirements	Compliance concerns	– A SOP has been developed for the management of the bioremediation and non-mineralised waste facility in compliance with required legislation and must be adhered to accordingly; – All staffed to be trained in the requirements of the procedure, especially with regards to offloading waste; – The security to maintain a register of waste entering and exiting the site; – A functional gate in place that is to be locked after hours when security is not available at the site; – The bioremediation site should be adequately fenced; – Appropriate signage (e.g. warning of contamination/excavation, providing site contact details, etc.) should also be provided; – Waste collectors to be escorted to the site at all times; and – The Environmental section to oversee the compliance of this site and conduct monthly	– Environmental audits and inspections	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		inspections and regular audits.		
Site establishment	Incorrect site establishment, construction and operational conditions for the bioremediation facility	– The site must be constructed on a flat or gently sloping site; – The site is located such that, in the event of accidental discharge, contaminated material will not readily access adjacent soil, surface water or groundwater; – Suitable geological conditions (e.g. soils with low permeability); – Sufficient distance from surface water bodies (it is recommended that the treatment sites should be at least 50 m from surface water bodies); – Sufficient separation of treatment cell from groundwater (bioremediation sites should only be located where groundwater is at a depth of greater than 3 m below ground surface); – Sufficient distance from potential discharge pathways such as drains, soak wells, service trenches; – Sufficient distance from odour sensitive receptors, e.g. any occupied (full or part-time) premises (It is recommended that this	– Environmental audits and inspections	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		distance is greater than 50 m). – The base and bunding of the bioremediation facility should be constructed in accordance with SOP requirements; – The HDPE liner system requirements must be aligned to the factors and conditions of what will be treated, strength, permeability and operational life span; – The bioremediation facility will utilise a basic composting technique and staged remediation strategy; – The facility should consist of three HDPE lined cells with approximate size of 10 m long x 5 m wide; – The depth of each cell should not exceed 2m to allow adequate sunlight penetration to expedite bioremediation; – Access should be provided to either side of each cell to allow safety in placement of contaminated material; – Each cell should have an access at one end to allow for equipment to drive into the cell to place material, till soil, water and remove material upon		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		- completion of bioremediation; – Each cell will have the capacity to allow storage of approximately 100 m³ hydrocarbon contaminated material; – Material at the bioremediation site should be watered and turned on a weekly basis; – If required additional bioremediation product to be applied; and – Maintenance of bioremediation site to be conducted monthly.		
	Incorrect site establishment, construction and operational conditions for the non-mineralised waste cells	– Only domestic general waste and recyclables that cannot be removed from site to be taken to the waste cells; – Cells have been constructed and are divided into waste type; – Signage to be erected by each waste type; – Waste to be burned on a regular basis to prevent attraction of wildlife to the area; – Waste to be covered where required to prevent items from becoming windblow; and – Fencing to be erected around the perimeter of the facility.	– Environmental audits and inspections	– Technical services manager
Groundwater , surface	Potential runoff of seepage from the solid	– Ensure the landfill is managed in accordance with site procedures and	– Environmental audits and inspections	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
water and soils	waste landfill site as a result of additional solid waste being disposed of in the on-site landfill	the landfill is covered and rehabilitated as required; and – Reduce the volume of material entering the landfill by continuing to implement the reduce, reuse and recycle principle installed on site.	– Waste volume monitoring – Groundwater monitoring programme	
	Oils, fuels and hydrocarbons resulting in soil, surface water and groundwater pollution	– All containers must be properly cleaned before disposal to ensure no excess chemicals are leached into the environment; – Provide for bunding and impervious surfaces as required to protect soils, groundwater and surface water in the layout of the bioremediation site; – Impervious surfaces are to be provided in areas where hazardous chemicals (e.g. acids, hydrocarbons, concentrates) are handled; – All hazardous chemicals including hydrocarbons such as fuel, oils and greases are to be contained in bunded areas with sufficient capacity to contain the quantity stored in the bunded area; – Stormwater runoff should be diverted so as	– Environmental audits and inspections – Groundwater monitoring programme – Surface water monitoring programme – Soil testing lab results	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		not to flow onto the treatment facility. – Leachate and stormwater runoff containing contaminant levels likely to cause environmental harm must not be discharged from the bioremediation facility. – All leachate run-offs should be directed to, and contained within, an impermeable leachate collection system with adequate capacity. – Leachate may be treated, recycled into the bioremediation area or disposed of at an appropriate off-site location; – Groundwater and surface water monitoring programme to be implemented as required; – Soils can only be returned to the natural environment for reuse after test work is done and the soils meet the required standard, in line with the SOP; – Any incidental water resulting from rainfall will remain within the bioremediation facility to assist with microbial growth and is expected to evaporate over short periods of time; and		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– In the event that rainfall exceeds evaporation, and the facility is approaching capacity, any water from within the facility will be pumped from the facility and put through the sites oily water separator (if available) or removed from site by a licensed contractor.		
Domestic effluent water management	Lack of appropriate ablution facilities can result in soil contamination and pollution	– Only approved ablution facilities to be utilised; – If additional ablution facilities are required, the Environmental section to be informed; – Ablution facilities must be easily accessible for employees, onsite security and contractors to use in remote working areas; – No employee or contractor on Navachab site may relieve themselves in the surrounding environment and work area; – Ablution facilities to be cleaned and maintained on a regular basis; and – Effluent water to be contained and spills to be cleaned up within 24 hours of the incident occurring.	– Environmental audits and inspections	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Potable water	Lack of potable water supply	– In remote working areas, potable water cannot be sourced through related infrastructure and employees should take water with them in canisters from the offices or change houses; and – Routine monthly potable water quality testing will be conducted at supplied water sources.	– Environmental audits and inspections – Potable water monitoring programme	– Technical services manager
Air quality	Emissions to air from bioremediation activities and landfill operations	– In the event that excessive dust is generated the area will be wet down to ensure no visible dust emissions are released from the bioremediation facility; – Navachab will continue to operate in accordance with the ambient dust monitoring programme to ensure the facilities do not generate excess dust and in turn, emissions to air; – If it is determined that emissions of volatile organic compounds (VOCs) from the facility are likely to pose a risk to human health and/or the environment, the company will conduct investigative monitoring downwind of the facility using gastec tubes; and – If it is determined that VOCs emissions are significant, the company	– Environmental audits and inspections – Air quality monitoring programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		will develop and implement an air quality monitoring program that will be designed to include regular measurement and testing of odours at the location of the facility and to outline any mitigation measures to be taken to reduce emissions from the facility.		
Biodiversity	Injury and or mortalities to wildlife entering and savaging at the facilities	– Area to be fenced off; – Daily observations by security; – Wildlife of concern to be reported immediately to the Environmental section; and – Incidents to be reported immediately to the environmental section and records maintained.	– Environmental audits and inspections – Incident management procedure	– Technical services manager
Stormwater management	No dirty water containment controls in place leading to pollution	– The current location of the non-mineralised waste site and bioremediation facility fall within S01 and this contact water will collect naturally in sump SU01, which is the most eastern corner of the site; and – Dirty water will further be channelled to south and north/northeast of the site in the diversions discussed in previous domains (J38 and J35 confluence to J43 and J31	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		to J32 and further northwards). Both diversions will deposit into pollution control pond No. 1.		
Decommissioning	Incorrect removal of site infrastructure and closure of site leading to soil, surface water and groundwater contamination	– Upon completion of bioremediation and removal of the remediated soil, the natural ground surface beneath the bioremediation area will need to be validated by sampling and analysis to ensure that no leaching of hydrocarbons into <i>in-situ</i> soil has occurred; and – Groundwater monitoring will be required for those sites where impacted material has leached to underlying soils and the potential exists for groundwater to be impacted.	– Environmental audits and inspections – Groundwater monitoring programme	– Technical services manager
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate	– Develop a rehabilitation plan and implement the requirements stipulated therein; – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	the landforms	the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and – Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required.		

2.14 DOMAIN 10: FUEL DEPOT AND WASH BAYS

This domain includes tasks for the fuel depot and wash bay(s) activities, which are mapped below (where possible):

- Fuel depot; and
- Wash bay(s)

The overall domain manager is the HME manager.

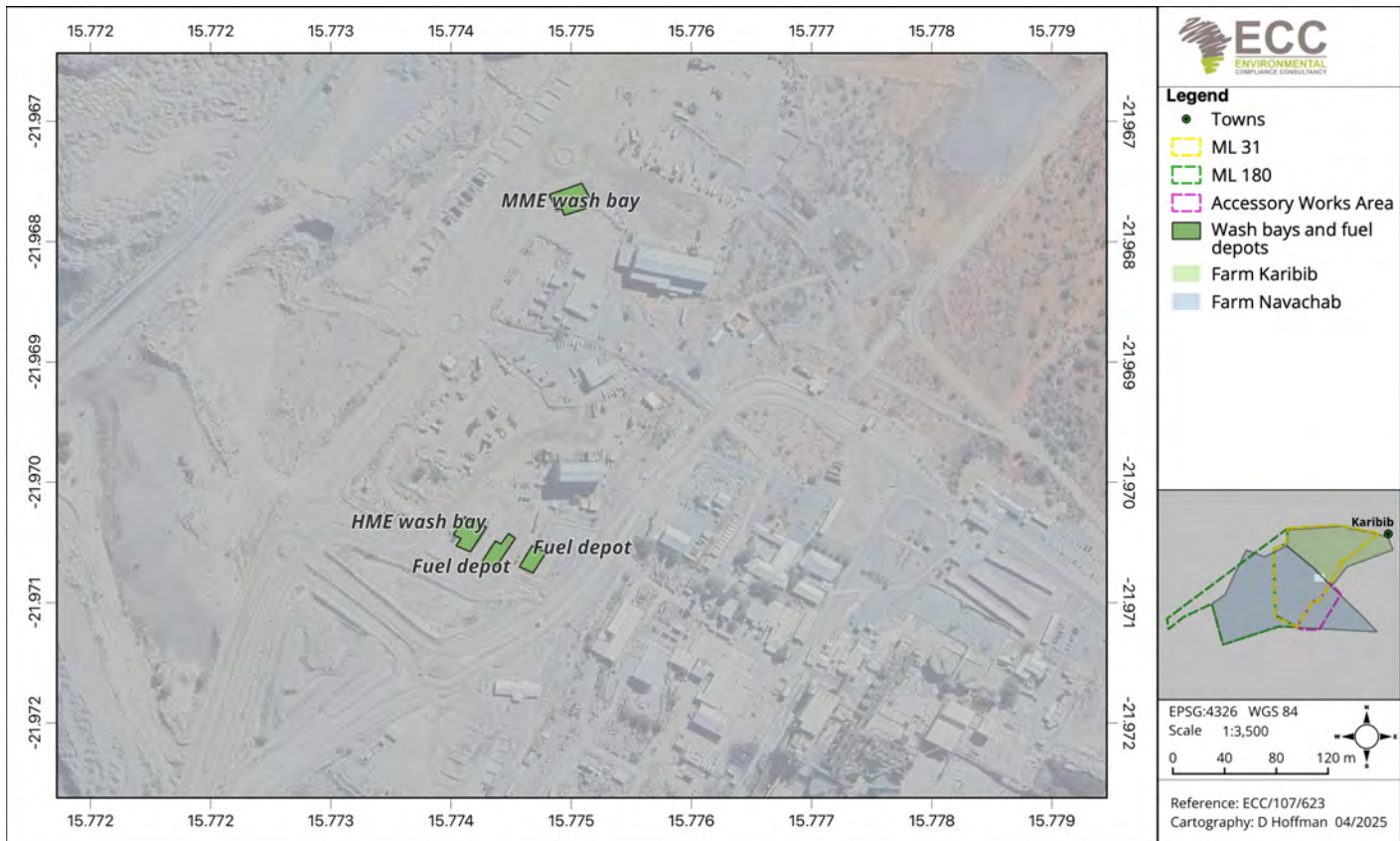


Figure 11 - Domain 10 map depicting the HME wash bay and fuel depot location

Table 11 – Environmental management plan for Domain 10; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Permitting	Compliance related concerns	– The bulk fuel supplier must be issued with a wholesale licence permit from MIME to be able to supply and trade with their fuel; – If contractors store fuel on site, a consumer installation permit must be applied for from MIME; and – Permits to be displayed on all fuel structures.	– Environmental audits and inspections	– HME manager
Soil and groundwater	Inappropriate infrastructure design of wash bay	– Wash bays must be constructed on a high lying area and not in a drainage line; – Wash bays must be able to accommodate all equipment, vehicles and plant required to access the area, taking weight and track plant into consideration; – Wash bays should have a silt and oil trap to collect these during the wash down process; and – Trenches should be constructed to capture any run-off and fines and divert this to the silt and oil traps.	– Environmental audits and inspections	– HME manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Incorrect hydrocarbon management leading to soil and groundwater contamination from the wash bay	– Silt and oil trap to be maintained, removed and cleaned on a regular basis, to prevent a build-up and blockage of the system; – If silt has traces of hydrocarbons in it, then to be removed for treatment at the bioremediation facility before being reused on site; – Traces and spills of hydrocarbons to be removed immediately to prevent build ups and overflows into the surrounding environment; – Oil traps to be managed and maintained as per the OEM specification; – Oil traps should be cleaned on a regular basis by removing excess hydrocarbons observed floating on the surface; – If a three cell oil trap is used, the last cell must not have an outlet but a valve installed for emergency situations; – Before water can be re-used in the processing circuit or for dust suppression	– Environmental audits and inspections – Oil trap effluent testing records – Cleaning and maintenance schedule – Waste records of treated bioremediated soils – Incident management system	– HME manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		from the oil trap, it should be tested to ensure the water is of a suitable and safe standard to be released back into the environment; – The hydrocarbon waste is to be collected and removed as used oil; – Oil traps should be bunded; – The silt trap must be constructed up gradient of the oil trap; and – All spill incidents to be immediately reported, cleaned and incident recorded.		
	Incorrect controls and management of fuel depot leading to soil and groundwater contamination	– The appointed bulk fuel supplier will manage the fuel depot on site; – Only trained staff to handle the bulk fuel and refuelling activities; – Fencing off fuel depot to avoid unauthorised entrance; – Bulk fuel when offloaded on site should take place during the daylight hours; – Fuel tankers will be double bunded and stored on impervious concrete surfaces with	– Environmental audits and inspections – Daily site inspections – Incident management system	– HME manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		an additional bund, that can contain 110 % of the volume of the largest tanker; – Small bunded containments need to be sheltered from the rain; – Pipelines must be regularly inspected and maintained in good order; – Pipelines must have release and air valves to contain the pressure, especially during extreme environmental heat conditions; – The MSDS to be displayed on the outside of the tanker; – Warning signs to be displayed on the outside of the tanker; – Spill kits and absorbent material to be readily available at all times during offloading, refuelling and storage; – Daily inspections of facilities; – Staff to switch off vehicle, equipment, plant and HME when refuelling; – Do not leave area unattended when refuelling; – All spills to be immediately		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		contained, reported and an incident recorded; and – Large spills of >200 L to be reported to MIME within 48 hours.		
Air quality	Fires resulting in emissions and/or explosions	– Storage areas require adequate ventilation; – Storage area to be kept clean and tidy and free of combustibles; – No fires or smoking in these areas allowed; and – Ensure fire extinguishers are kept in close proximity and attended to regularly.	– Environmental audits and inspections – Daily site inspections	– HME manager
Stormwater management	– No dirty water containment controls in place leading to pollution	– Wash bay and fuel depot areas associated with S01 contact water will collect naturally in sump SU01, which is north of the associated infrastructure; and – Dirty water will further be channelled to south and north/northeast of the site in the diversions discussed in previous domains (J38 and J35 confluence to J43 and J31 to J32 and further northwards), both diversions will deposit into pollution control pond No. 1.	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– HME manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate the landforms	– Develop a rehabilitation plan and implement the requirements stipulated therein; – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Monitoring of the rehabilitation and re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and – Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required.	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– HME manager – Technical services manager

2.15 DOMAIN 11: NAVACHAB FARM AND NURSERY

This domain includes tasks for the wildlife reserve management on farm Navachab and on-site nursery operational activities. Note the main nursery is planned to be relocated offsite and the requirements depicted in Table 12 and the Navachab rehabilitation management plan remain applicable. The overall domain manager is the technical services manager.

Table 12 – Environmental management plan for Domain 11; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Fauna	Lack of conservative initiatives could result in injury and/or mortality to wildlife	– No game may be killed for recreation or consumption; – Poaching incidents are dealt with by contacting onsite security, who will in turn contact the police and MEFT, as well as Navachab personnel responsible for wildlife and reserve management; – The fence around farm Navachab is patrolled on an ad-hoc basis and maintained; – Salt licks are put out at the watering points on an ad-hoc basis; and – Watering points are checked on an ad-hoc basis and maintained.	– Environmental audits and inspections – Incident management records	– Technical services manager
Flora	Lack of conservative initiatives could result in a loss of indigenous species	– Alien invasive species, especially Wild Tobacco, are to be controlled on the farm property.	– Environmental audits and inspections – Alien invasive species monitoring programme	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	Unauthorised activities on the farm	– Firewood may not be removed from the farm.	– Environmental audits and inspections	– Technical services manager
	No on-site nursery resulting in a lack of trails and flora for rehabilitation and restoration activities	– Functional nursery to supply indigenous plants for the purposes of rehabilitation; – Valid and authorised on-site nursery certificate/permit from MEFT; and – Timely renewal of permits as only valid for 1 year.	– Environmental audits and inspections – Nursery checklist – Nursery certificate from MEFT (if required) – Rehabilitation plan	– Technical services manager
	Lack of controls to operate nursery correctly	– Procedure to be developed with appropriate checklists for use by staff involved with the nursery operations; – Only protected plant species to be cultivated; – Seeds to be collected for cultivation; – Register to be kept of seeds collected and plants grown; – Plants to be used for revegetation, restoration and rehabilitation purposes; and – No plant may be sold or traded.	– Environmental audits and inspections – Nursery checklist – Nursery seed/growth register – Rehabilitation plan	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Rehabilitation	– No rehabilitation plan in place resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate the landforms	– Develop a rehabilitation plan and implement the requirements stipulated therein; – An onsite nursery operation to commence for preparation for infield trials and providing seeds, seedlings and/or trees for revegetation purposes. – Re-vegetation to be conducted through direct seeding and tree-planting, from seeds sourced on site/bought and seedlings grown in the onsite nursery; – Update species list for nursery operations following TSF 2 reference site confirmation of vegetation; and – Investigate manure sourced from Mariental Piggery as fertilizer and charcoal fines /biochar from Jumbo Charcoal for use in nursery operations and for infield trials. Charcoal fines / biochar to be mixed with the soil to increase the absorption potential of the soil, possibly	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		unlocking carbon sequestration and most important sustaining high yields of growth.		

2.16 DOMAIN 12: TOPSOIL STOCKPILES

This domain includes tasks for topsoil stockpile activities. The overall domain manager is the operational mining manager.

Table 13 – Environmental management plan for Domain 12; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Stockpile management	Incorrect topsoil removal and storage	– Limit disturbance to soils to what is absolutely necessary; – Suitable topsoil will be identified by the production geologist and retained in burgundy stockpiles for future rehabilitation activities; – Topsoil stockpile areas will be identified as far as practically possible to the source of the soil; – Stockpiles to be demarcated; – Soil erosion measures to be investigated and applied as soon as practically possible; – Soil stockpile heights to be restricted where possible to 20 m; – Storage periods not to exceed three years,	– Environmental audits and inspections – Annual records of topsoil volumes for mine closure – Rehabilitation plan	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		where this is not possible erosion controls to be implemented; – No waste or other material to be mixed with topsoil; and – Movement of equipment on stockpiles to be restricted.		
Soils management	Incorrect stripping and handling of soils	– Soils to be stripped to a depth of 300 mm where feasible; – Handle soils in dry weather conditions as far as possible to reduce compaction; and – Reoccurring rehabilitation to be encouraged to ensure fresh topsoil is used to restore/rehabilitate areas and reduce stockpile sizes.	– Environmental audits and inspections – Rehabilitation plan	– Operational mining manager
	Contaminated soil	– If soil becomes contaminated/polluted, the soil must firstly be treated <i>in situ</i> by applying bioremediation products; – If not possible then the soils must be removed to the bioremediation site for further treatment.	– Environmental audits and inspections	– Operational mining manager
Rehabilitation	– No rehabilitation plan in place	– Develop a rehabilitation plan and implement the	– Mine closure plan and	– Operational mining manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate the landforms – Incorrect volumes of topsoil sourced for mine closure	requirements stipulated therein; – Determine topsoil availability on site and if topsoil should be sourced from the local environment. – Geotechnical test work to be conducted on selected topsoil samples; and – Topsoil material, sites and volumes to be confirmed and stripping to commence, ± 1 year before material is required for re-vegetation.	closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Technical services manager

2.17 DOMAIN 13: EXPLORATION (EPL 999 AND EPL 3275)

This domain includes tasks for the exploration activities on exclusive prospecting licences (EPL) 999 and 3275. The overall domain manager is the Chief geologist. Figure 12 and Figure 13 represent the locality map of EPL 999 and EPL 3275, respectively.

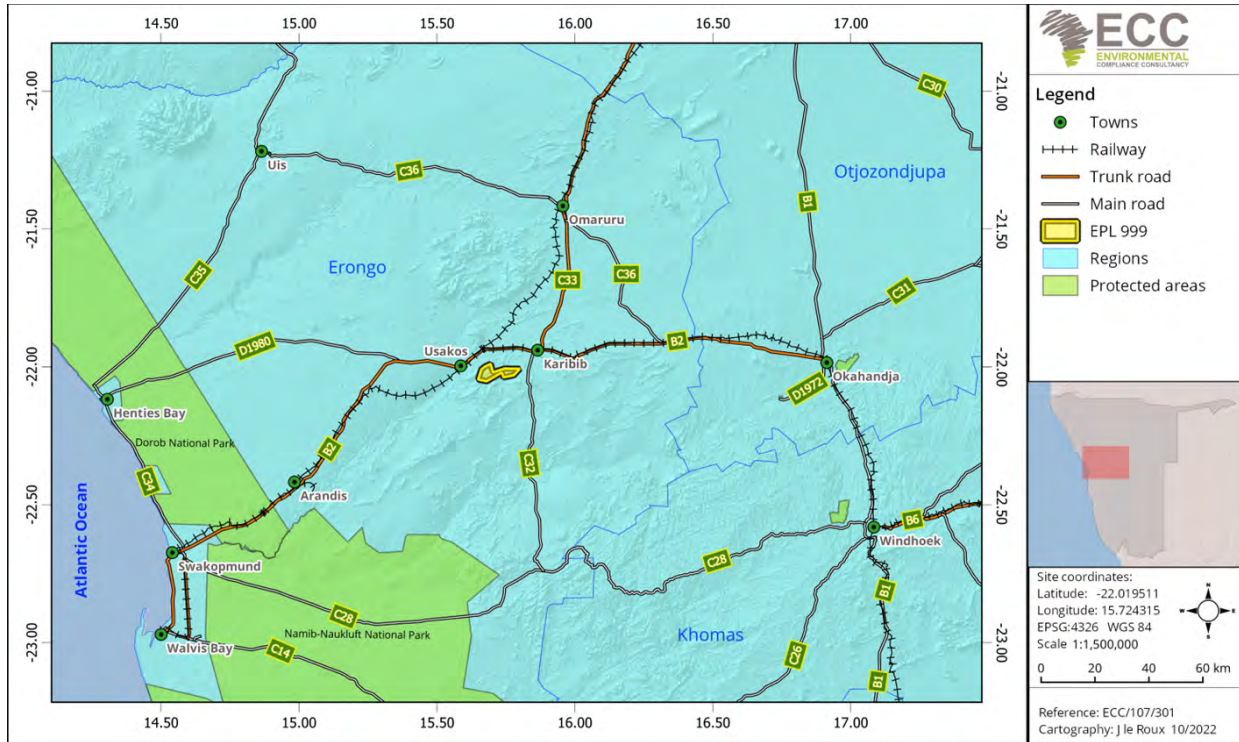


Figure 12 - Location map of EPL 999

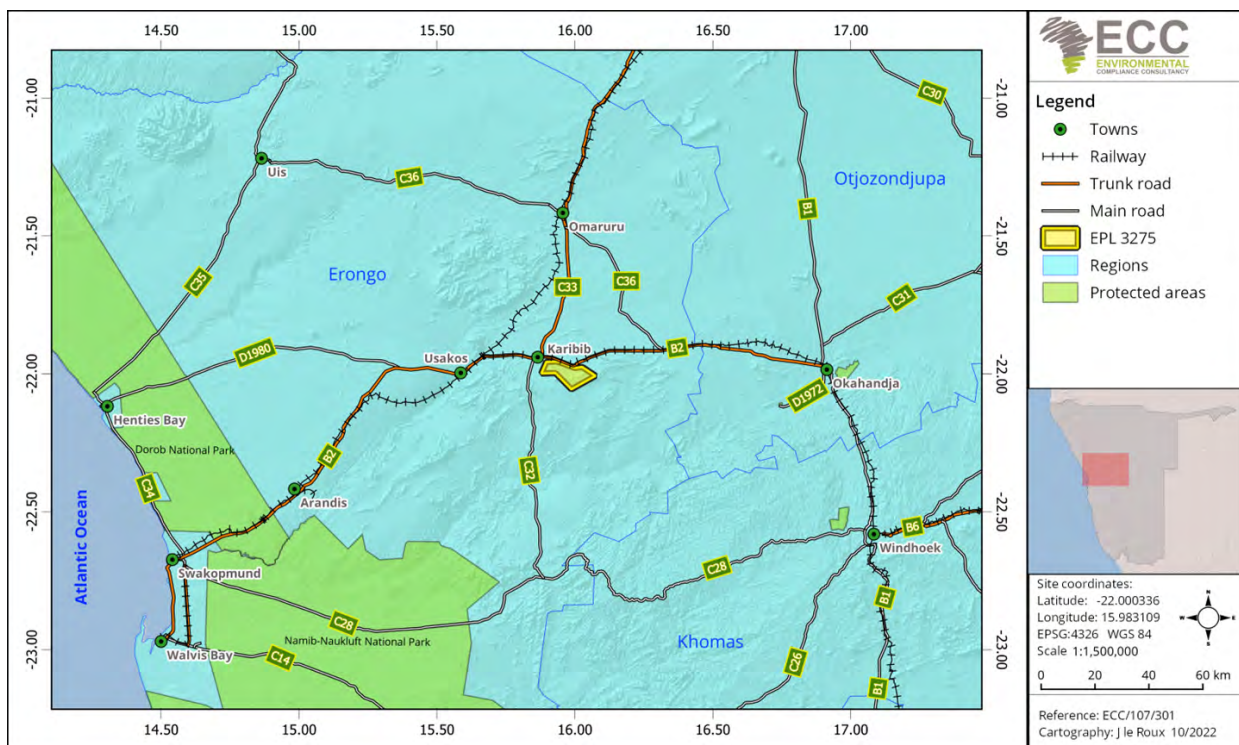


Figure 13 - Location map of EPL 3275

Table 14 – Environmental management plan for Domain 13; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Training and awareness	Lack of environmental knowledge on OEMP requirements leads to environmental incidents	– All employees, visitors and contractors are required to go through a general site induction when entering the mine site; – A site-specific induction is required for all staff and contractors who will work in the EPLs and will be made aware of specific conditions per landowner requirements; – Environmental section to provide weekly information regarding environmental issues of concern that the Exploration geologist will convey to staff and contractors working in the EPLs; – Awareness will be distributed by various channels as deemed appropriate; – Notice/awareness boards to be kept up to date with the latest information shared; – All vehicles to reverse park in the EPLs; – All staff and contractors working in the EPLs must first clock in at the mine entrance before	– Environmental audits and inspections	– Chief geology – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		proceeding to the EPLs; and – Staff members and contractors will utilise the correct PPE during exploration activities		
Flora and fauna	Damage to indigenous vegetation	– To minimise the effects of exploration activities on indigenous vegetation, photographs should be taken before commencement of the activity, on completion of rehabilitation measures, and after one rainy season to monitor the recovery of the vegetation.	– Pre-disturbance inspection and associated checklists – Rehabilitation and close out inspection and associated checklists – Bi-annual reports to MEFT – Regular inspections /audits between Geology and OHSE departments – Rehabilitation plan	– Chief geologist – Technical services manager
	Injury and/or damages/death to flora and fauna	– No hunting, wood or plant collection is permitted and no firewood may be collected without the concurrence of the landowner; and – The environmental section to be contacted if animals of concern are noted	– Environmental audits and inspections – Physical and signed agreement (records) with the landowner(s)	– Chief geologist

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		and/or need to be relocated (e.g. snakes, scorpions, baboons, leopards etc.).		
		The starting of the veld fires shall be prevented, and every effort shall be made to extinguish a fire as quickly as possible should it occur as a direct or indirect result of Navachab and contractor activities.	- Daily inspections - Physical and signed agreement (records) with the landowner(s) - Environmental inspections and audits	Chief geologist
		- Prevent water from pooling around drill sites and where this is not possible, cordon off the water source from wildlife/domestic animals; and - Discuss with the landowner the possibility of erecting artificial water points (e.g. water troughs) to deter wildlife/domestic animals from drinking possibly contaminated water from the drill sites.	- Environmental inspections and audits - Physical and signed agreement (records) with the landowner(s)	Chief geologist
Landowners	Negative relations with farm owners and the local community	- Good relationships must be built and maintained with the landowner and local community; - Before exploration work commences, the landowners must be	Complaints register	Chief geologist

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		consulted and informed of the length, duration and specific location of the exploration activities; – All staff working on the EPLs must have identification cards on them when entering any landowner property; – The drill site must always be demarcated with physical barriers and signage during drilling activities; and – Where drilling activities have temporarily ceased, signage must remain at the drill site so that the landowner is aware that the specific drill site is still active.		
	Lack of compensation during exploration activities	– The landowner shall be compensated for any resource used by the crew on site, e.g. the use of water.	– Non-disclosure agreements	– Chief geologist
Roads/track management	– Negative relations with farm owners and the local community – Poor maintenance leading to potential vehicle incidents	– Vehicle movement must be restricted to existing fence lines, roads, tracks, and dry riverbeds; – Should the need arise to create new roads or tracks, they shall be planned so as to cause no unnecessary environmental damage and only	– Environmental audits and inspections – Physical and signed agreement (records) with the landowner(s) – Pre-disturbance inspection	– Chief geologist

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	– Injury and/or damages/death to flora and fauna	– established with prior approval from the landowner; and – All new roads must be rehabilitated on completion of the Project.	– and associated checklists – Rehabilitation and close out inspection and associated checklists – Rehabilitation plan	– Chief geologist
Trenches and holes	– Injury and/or damages/death to flora and fauna – Injury and/or death to workforce or third parties	– Exploration trenches/pits should be backfilled within 8 weeks of completion of the excavation.	– Rehabilitation and close out inspection and associated checklists – Environmental audits and inspections – Rehabilitation plan	– Chief geologist
	– MIME requirements not adhered to	– Drill holes must be capped with cement or steel and tagged with the borehole number.	– Environmental audits and inspections	– Chief geologist
	– Lack of appropriate restoration leading to vegetation not re-establishing – Injury and/or damages/death to flora and fauna – Injury and/or death to workforce or third parties	– All sumps used in the drilling process must be backfilled and the area restored as close as possible to its original status; and – If drill sites cannot be closed off due to future work required at these boreholes, then partial rehabilitation to be carried out within 2 weeks of all final chip	– Environmental audits and inspections – Rehabilitation and close out inspection and associated checklists	– Chief geologist

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		samples removed from the drill site		
Infrastructure	Maintaining good landowner relations	– If permanent buildings are to be built on the exploration site, prior agreement with the landowner is required; and – Temporary campsites shall be established in agreement with the landowner.	– Physical and signed agreement (records) with the landowner(s)	– Chief geologist
		– Once a drilling programme has ceased, all material from the drill site is required to be removed and a rehabilitation and close out inspection conducted.	– Environmental audits and inspections – Rehabilitation and close out inspection and associated checklists	– Chief geologist
Water	Resource waste and management	– Any use of water for whatever purpose must be done in consultation with the landowner and the landowner shall be duly compensated for the use of such water.	– Physical and signed agreement (records) with the landowner(s)	– Chief geologist
Hazardous and non-hazardous waste management	Incorrect management of waste can result in littering, visual pollution, air pollution, soil contamination, surface water and/or	– All drilling and domestic refuse will be deposited on the Navachab Gold Mine or removed off site to a registered landfill site, respectively; – Drill chip waste will be placed back into the boreholes where feasible;	– Physical and signed agreement (records) with the landowner(s) – Environmental audits and inspections – Rehabilitation and close out	– Chief geologist

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	groundwater pollution	– If agreements are in place with the landowners, then drill waste such as drill chips can be disposed of on the farm at respective waste sites; and – All sample bags and drill chip waste will be removed from the drill site as soon as possible following drill work completed at the specific borehole.	– inspection and associated checklists – Rehabilitation plan	
		– All muck piles must be removed from drill sites and dumped at a suitable site in consultation with the landowner.	– Rehabilitation and close out inspection and associated checklists – Physical and signed agreement (records) with the landowner(s) – Rehabilitation plan	– Chief geologist
		– Used oil and grease must be collected in drums and taken to the HME workshop on Navachab Gold Mine; and – Used oil is collected for recycling.	– Environmental audits and inspections	– Chief geologist
		– Painting of rocks to mark grids in the field should be done with a water-based paint to	– Environmental audits and inspections	– Chief geologist

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		ensure weathering of the paint with time. – Soil and rock on which oil has been spilled must be dealt with as per the spill management plan in the OEMP; – Hydrocarbon spills should be removed as soon as practically possible, taking the wet and dry season conditions into account; – Drip trays and HDPE liner should be used during drilling activities and placed under the rig and support equipment to avoid unwanted spills; – All hydrocarbons and hazardous materials/chemicals used during drilling must be marked, stored in drip trays and MSDS accompany the products onsite; – Spill preventative equipment and materials to be made available at drill sites; and – Maintenance of equipment should be conducted off site and not in the EPLs, where practically possible. Measures must be put	– Environmental audits and inspections	– Chief geologist

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		in place to prevent spills if this cannot be avoided.		
		– Suitable portable chemical toilets must be used on site; – The portable toilet must not contaminate the surrounding soil and groundwater; and – Sewage water must be removed from site on a regular basis by a registered waste removal company.	– Environmental audits and inspections	– Chief geologist
Resource use	Inefficient use of water	– Use water effectively and efficiently.	– Environmental audits and inspections – Records of water usage	– Chief geologist
Job creation	Employment creation and skills development opportunities during the exploration phase.	– Maximise local employment and local business opportunities; – Enhance the use of local labour and local skills as far as reasonably possible; and – Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.	– HR policies and procedures	– Chief geologist
Heritage sites	Loss or damage to heritage sites	– Chance finds to be reported to the environmental section in line with the Chance Finds Procedure; and	– Environmental audits and inspections – Archaeological monitoring programme	– Chief geologist – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		No unauthorised removal or damage to artefacts is allowed.		
Rehabilitation	- No rehabilitation plan in place resulting in impractical requirements at mine closure - A lack of progressive rehabilitation and failure to revegetate the landforms	- Develop a rehabilitation plan and implement the requirements stipulated therein; - Monitoring of the rehabilitation and any re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team; - Erosion controls to be implemented timeously; and - Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and geohydrology study work required.	- Mine closure plan and closure schedules - Rehabilitation monitoring based on rehabilitation plan	- Chief geologist - Technical services manager

2.18 DOMAIN 14: SOLAR POWER PLANT

This domain includes tasks for the solar power plant (to be developed/constructed) activities, which are mapped below:

- Option 1 north of clinic; and
- Option 2 processing plant next to filter cake plant

Take note that the location has not yet been determined and the figure below is subject to change (Figure 13). Also please note that Table 15 is a high level overview of the management plan for the proposed activities of this domain, which is still subject to change based on specialist studies and the assessment process outcomes from the separate environmental clearance certificate application for this listed activity.

The overall domain manager is the projects and planning manager. Once the Project is completed, the domain will be handed over to the relevant manager.

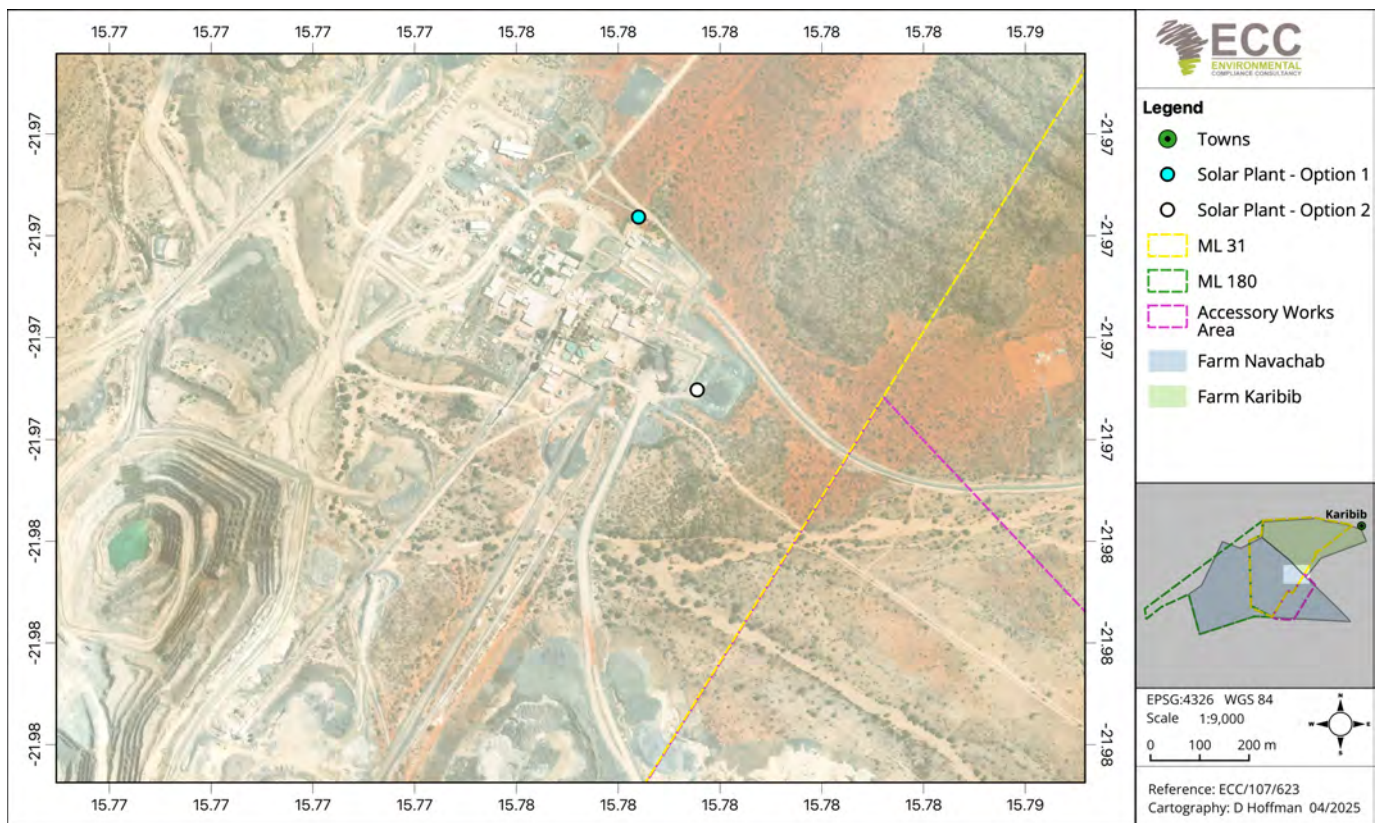


Figure 14 - Location map for the solar power plant option 1 (north of clinic) and option 2 (processing plant) – locations not yet finalised and subject to change

Table 15 – Environmental management plan for Domain 14; listing environmental aspects, impacts, associated mitigation measures, monitoring requirements and responsible person(s)

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Site establishment	Site clearing without approval	– Once the ESIA has been issued to MEFT and environmental clearance certificate has been issued, the project activities can commence; – Land clearing and disturbance may only start after a signed-off site preparation permit is issued; – If topsoil is required to be removed, vegetation must be cleared with the topsoil (300 mm) in bund walls around the construction site or to the nearest dedicated topsoil stockpile; – Construction sites must be cleared and demarcated with the use of coloured pegs; – Sensitive areas (e.g. protected vegetation) to be demarcated with appropriate durable demarcation netting (no snow netting); – Disturbance to be restricted to approved areas only; – Where areas have been unnecessarily disturbed, these must be immediately rehabilitated; and	– Environmental audits and inspections – Site preparation permit	– Projects and planning manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– An incident register to be maintained throughout construction and operational activities.		
Biodiversity	Physical and general disturbance to indigenous vegetation and local fauna during construction (earthworks, site preparation, laydown areas, drilling, trenching, materials delivery, etc)	– Construction activities to be limited to the actual footprint of the solar power plant area; – All activities related to the power plant should be limited to the project area, except where the trenching for powerline cables or further surface water controls are required; – Backfill all open trenches with the same soil removed. No topsoil to be used from existing stockpiles; – Where required, use additional soil from mining activities after obtaining the appropriate permission from the relevant departments and domain managers; – The contractor shall not deface, paint, damage or mark any natural features outside the site; – The removal, damage or disturbance of	– Pre-construction inspection and associated checklists – Rehabilitation and close out inspection and associated checklists – Environmental inspections and audits – Rehabilitation plan	– Projects and planning manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		flora, fauna or avifauna is forbidden; – No poaching, trapping or hunting of fauna and flora; – No feeding of wildlife and no domestic pets or livestock on site; – Any identified flora species are to be relocated to the onsite nursery before construction activities commence. If these species are protected, then a harvesting permit to be arranged with the Department of Environmental Affairs and Forestry before removal; – If required, relocate fauna of concern (e.g. borrows) before construction activities commence; – Prevent the spread of waste in and beyond the construction area; – Any disturbance outside of the project area scope or off-road tracks must be rehabilitated as per the Navachab Rehabilitation plan; – Where required, the project area is to be rehabilitated before being handed over for operations; and		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– A close out inspection must be conducted with the contractor, domain manager and OHSE department on project completion.		
	Physical and general disturbance to indigenous vegetation and local fauna during operations	– Implement a high efficiency system for cleaning of the panels; – Prevent erosion from water flowing off the panels; – Control the growth of alien invasive plant species (monitor and remove these species); and – An avifauna specialist study to be conducted for the project to advise on mitigation measures required for the operational phase.	– Environmental inspections and audits – Domain manager inspection	– Operations appointed domain manager
	Collisions of birds on solar plant panels and associated infrastructure	– A monitoring programme to be developed to monitor the potential impacts of avifauna collisions with the solar plant panels; – Should the monitoring results show that such impacts, including injuries and/or mortalities of birds are taking place, mitigation measures would need to be investigated, if necessary, on a species-specific basis;	– Environmental inspections and audits – Avifaunal monitoring programme – Domain supervisors/foreman daily and weekly inspections	– Operations appointed domain manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– These mitigations could include minor modifications of the panel design, in order to reduce the illusory characteristics of these structures; – The solar plant should be fenced with jackal-proof fencing to reduce indirect predation of any bird collision species (if injured and still alive), attraction for the creation of dens, and also to prevent the removal of any carcass material before it is recorded; – Security lighting should be kept to the minimum and directed downward and away from the panels if possible; – The panels themselves should not be directly illuminated; – If numerous bird carcasses are found around the modules/solar arrays, investigate and implement relevant management and mitigation measures to avoid/reduce further impacts; and – In addition to formal carcass searches,		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		operational staff should report bird mortalities through the formal incident reporting system.		
	Attraction of novel avifauna species to an area by the artificial provision	– Maintain records of avifauna and monitor new species onto or beneath the solar panel structures; – Should any negative impacts occur, mitigation measures to be implemented to address these impacts; and – Bird nesting activities should be discouraged early in the cycle, before any eggs are laid.	– Environmental inspections and audits – Avifaunal monitoring programme – Domain supervisors/foreman daily and weekly inspections	– Operations appointed domain manager – Technical services manager
	Collisions and/or electrocution of avifauna on powerline structures	– Where possible, bury the powerline cables and associated infrastructure to avoid collision or electrocution; and – Should the powerline (or any components) be constructed above-ground, using pole structures, mitigation measures would need to be implemented as recommended by the avifauna specialist study.	– Environmental inspections and audits – Avifaunal monitoring programme – Domain supervisors/foreman daily and weekly inspections	– Operations appointed domain manager – Technical services manager
Noise	Increase in nuisance noise levels during construction	– Limit construction activities to the daytime hours, where	– Environmental inspections and audits	– Projects and planning manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	activities (earthworks, material delivery and storage etc.)	- possible (e.g. 07:00 – 19:00); – Maintain machinery, vehicles and equipment in good condition to prevent unnecessary noise outputs; and – The contractor shall ensure that workers do not create unnecessary noise such as hooting or shouting; and – Bi-annual noise monitoring.	– Domain supervisors/foreman daily and weekly inspections – Environmental monitoring programme	– Technical services manager
	Increase in nuisance noise levels during operations	– Maintain machinery, vehicles and equipment in good condition to prevent unnecessary noise outputs; and – Bi-annual noise monitoring.	– Environmental inspections and audits – Domain supervisors/foreman daily and weekly inspections – Environmental monitoring programme	– Operations appointed domain manager – Technical services manager
Air quality	Increase in dust levels (nuisance and health impacts) during construction activities (earthworks, material delivery and storage etc.)	– The contractor shall ensure that the generation of dust is minimised and shall implement a dust control programme, with reference to the measures provided below, to maintain a safe working environment and minimise dust nuisance;	– Environmental inspections and audits – Domain supervisors/foreman daily and weekly inspections – Environmental monitoring programme	– Projects and planning manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		- Dust suppression to be applied through water bowsers/water sprays on construction sites and on roadways; - Navachab environmental section to monitor depositional dust on a monthly basis; and - All construction vehicles to adhere to the required road speed limits.		
	Increase in dust levels (nuisance and health impacts) during operational activities	- Navachab environmental section to monitor depositional dust on a monthly basis; - All operational vehicles to adhere to the required road speed limits; and - Where maintenance activities during operations will generate dust, dust suppressant measures to be applied through water sprayers.	- Environmental inspections and audits - Domain supervisors/foreman daily and weekly inspections - Environmental monitoring programme	- Operations appointed domain manager - Technical services manager
Visual and loss of sense of place	- Visual impacts from the solar plant infrastructure and buildings - Lighting of infrastructure	- Limit the construction activities to the day time hours (07:00 – 19:00); - Construction activities to only take place on the project site; - Manage all dust plume sources with	- Environmental inspections and audits - Domain supervisors/foreman daily and weekly inspections	- Projects and planning manager - Operations appointed domain manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
	e during the night	dust suppressants to limit visual intrusion by dust, in the event of excessive dust generation; – The use of night light will be kept to a minimum and will illuminate only that which is required; – The use of standard high pole flood lights will be avoided. – Yellow lighting is recommended and/or light emitting diode (LED) lighting is reported to be unattractive to insects and vertebrates, and should be used where possible; – Lights should be directed downwards where possible; – Painting infrastructure with colours that blend in with the surrounding environment, where feasible; – Adhere to the Navachab waste management procedures; – Enforce good housekeeping practises throughout shift; and – Prevent littering.		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
Surface water and groundwater	- Contamination of surface water and groundwater resources from earthmoving equipment and machinery (hydrocarbon spills) during construction - Contamination from the storage and handling of hydrocarbon and hazardous chemical substances during construction	- Contained areas with impermeable floors for process areas, sewage facilities, wastewater, waste storage areas, concrete works, painting areas and hydrocarbon storage areas; - Prevent pollution through educating and training of workers; - Prevent pollution of drainage lines/water ways; - Cement and concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces; - Used cement bags shall be stored in weatherproof containers to prevent windblown and disposed appropriately; - All excess concrete shall be removed from site on completion of concrete works and disposed of in line with relevant procedures; - Washing of the excess concrete into the ground is prohibited;	- Environmental inspections and audits - Domain supervisors/foreman daily and weekly inspections	Projects and planning manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– All hydrocarbons (e.g. fuel, oils, contaminated soil/waste) and other hazardous waste (e.g. paint, bitumen, tar, etc.) resulting from spills, shall be disposed of at a licensed hazardous waste site or, where possible, or sold to an approved used-oil recycling company; – The contractor shall keep records of disposal certificates on site and provide these to Navachab on request; – In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained; – Any hydrocarbon and other hazardous substance spills will be reported and cleaned up immediately; – Spill kits or adsorbent materials will be made readily available; – No repairs and maintenance to machinery, vehicles and equipment shall be allowed on the project site. This shall be undertaken at the		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		approved workshop or laydown area; – Refuelling of diesel or petrol to take place over a drip tray or within a lined and bunded area; – All hazardous substances to be stored in lined and bunded areas (110% of volume). The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled / leaked fuel, oil or hazardous substance into the soil; – The contractor shall have a copy of the material safety data sheets readily available and ensure that contractor employees, who are required to use such substances, are fully conversant with the safe handling precautions, protective equipment to be used and storage precautions to be taken; – Maintain all vehicles free of leaks (oil, hydraulic fluid etc.). Daily Inspections and regular planned maintenance		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		programmes to be enforced; – Ensure good housekeeping and proper sanitation and treatment of wastewater during construction and operations; and – Ensure all required stormwater controls are implemented for the project site.		
	Contamination of domestic effluent from portable ablutions during construction activities	– The contractor shall ensure suitable sanitary facilities are available and toilets must be easily accessible during construction; – The contractor shall be responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition; – The cleaning of toilets will be conducted in line with the contract agreement with Navachab; – The licensed sewage removal sub-contractor shall ensure that there is no spillage when the chemical toilets are cleaned and that the contents are properly removed from site to	– Environmental inspections and audits – Domain supervisors/foreman daily and weekly inspections – Waste records/register – Safe disposal certificates	– Projects and planning manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		the Karibib wastewater works; – Safety certificates/records to be provided of the disposal; – The contractor shall be responsible for enforcing the use of these facilities; and – Relieving oneself outside of established toilet facilities is strictly prohibited.		
	– Natural surface water flow interference from earthworks – Increased stormwater runoff from modules / solar array surfaces and roads, could result in the concentration of stormwater flows, reduced infiltration and increased risk of erosion	– Navachab shall protect areas susceptible to erosion and the blocking of natural surface water drainage by installing necessary stormwater drainage infrastructure; and – Ensure that clean stormwater is directed around the site.	– Environmental inspections and audits – Domain supervisors/foreman daily and weekly inspections	– Projects and planning manager
Water resources	Water supply for construction	– Only use the allocated volumes of water for construction activities	– Environmental inspections and audits	– Projects and

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		and dust suppression; and – Minimise water consumption where feasible.	– Domain supervisors/foreman daily and weekly inspections	planning manager
	Cleaning of solar panels during operations	– Ensure that the water volumes required for cleaning are adequately accounted for and where additional water is required this must be communicated with the relevant domain manager.	– Environmental inspections and audits – Domain supervisors/foreman daily and weekly inspections	– Operations appointed domain manager
Soil resources	– Contamination of soils from earthmoving equipment and machinery (hydrocarbon spills) during construction – Contamination from the storage and handling of hydrocarbon and hazardous chemical substances during construction	– Contained areas with impermeable floors for process areas, sewage facilities, wastewater, waste storage areas, concrete works, painting areas and hydrocarbon storage areas; – Prevent pollution through education and training of workers; – Cement and concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces; – Used cement bags shall be stored in weatherproof containers to prevent windblown and	– Environmental inspections and audits – Domain supervisors/foreman daily and weekly inspections	– Projects and planning manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		disposed appropriately; – All excess concrete shall be removed from site on completion of concrete works and disposed of in line with relevant procedures; – Washing of the excess concrete into the ground is prohibited; – All hydrocarbons (e.g. fuel, oils, contaminated soil/waste) and other hazardous waste (e.g. paint, bitumen, tar, etc.) resulting from spills, shall be disposed of at a licensed hazardous waste site or, where possible, sold to an approved used-oil recycling company; – The contractor shall keep records of disposal certificates on site; – In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained; – Any hydrocarbon and other hazardous substance spills will be reported and cleaned up immediately;		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– Spill kits or adsorbent materials will be made readily available; – No repairs and maintenance to machinery, vehicles and equipment shall be allowed on the project site. This shall be undertaken at the approved workshop or laydown area; – Refuelling of diesel or petrol to take place over a drip tray or within a lined and bunded area; – All hazardous substances to be stored in lined and bunded areas (110% of volume). The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled / leaked fuel, oil or hazardous substance into the soil; – The contractor shall have a copy of the material safety data sheets readily available and ensure that the contractor employees, who are required to use such substances, are fully conversant with the safe handling precautions,		

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		protective equipment to be used and storage precautions to be taken; – Maintain all vehicles free of leaks (oil, hydraulic fluid etc.). Daily Inspections and regular planned maintenance programmes to be enforced; – Ensure good housekeeping and proper sanitation and treatment of wastewater during construction and operations; and – Ensure all required stormwater controls are implemented for the project site.		
Waste management (non-mineralised, hazardous and non-hazardous waste)	Littering and pollution of soils/groundwater during construction and operational activities	– Litter generated must be collected in plastic bags and/or stored directly in the waste receptors provided; – Waste must be separated at source as per the waste management procedure in the correct colour coded bins and/or skips; – Bins and skips must be in a good condition, have lids, that can seal and are scavenger/baboon proof;	– Environmental audits and inspections – Waste records/register – Safe disposal certificates	– Projects and planning manager – Operations appointed domain manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		– No waste may be burnt or buried on site, apart from remaining paper, plastic, boxes and food waste at the waste site; – No fires will be allowed on site, unless in approved designated areas allowed by the technical services manager; – Domestic waste is disposed of weekly at the non-mineralised waste site; – Hazardous solid waste generated should be removed from site and disposed of at a suitable registered hazardous waste facility; – A copy of the safe disposal of these wastes to be maintained as a record on file and provided to the environmental section on request; and – Medical waste is taken to Walvis Bay landfill site for incineration.		
Heritage sites	Loss or damage to heritage sites during construction activities	– Chance finds to be reported to the environmental section in line with the	– Environmental audits and inspections	– Operations appointed domain manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		Chance Finds Procedure; and – No unauthorised removal or damage to artefacts is allowed.	– Archaeological monitoring programme	– Technical services manager
Stormwater management	– No dirty water containment controls in place leading to pollution	– The current location of the plant is still to be confirmed, however controls as per the 2023 SWMP have been discussed in this report in previous domains that will account for the contact and non-contact stormwater controls and requirements.	– Environmental audits and inspections – Stormwater management plan – Survey database – Stormwater monitoring programme	– Operations appointed manager
Rehabilitation	– No rehabilitation plan in place, resulting in impractical requirements at mine closure – A lack of progressive rehabilitation and failure to revegetate the landforms	– Develop a rehabilitation plan and implement the requirements stipulated therein; – Monitoring of the rehabilitation and any re-vegetation work must be conducted throughout the activity and/or trials by a dedicated rehabilitation contractor and team, erosion controls to be implemented timeously; and – Final landforms to comply with domain requirements in the rehabilitation plan and any additional geotechnical and	– Mine closure plan and closure schedules – Rehabilitation monitoring based on rehabilitation plan	– Operations appointed domain manager – Technical services manager

Aspect	Impact	Management/mitigation measure	Monitoring requirements	Responsibility
		geohydrology study work required.		

3 ENVIRONMENTAL MANAGEMENT PRINCIPLES

3.1 CONTINUAL IMPROVEMENT

The Navachab environmental section is responsible for reviewing and updating this OEMP, which will be supported by the monthly reports on compliance for each domain. 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 OEMP will be amended as required and follow up training, awareness or updates will be provided.

Ongoing aspect and impact identification through the review of the OEMP 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 summary in Table 16.

Table 16 – 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 or approved locations; – Spill kits available wherever 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; – Efficient stormwater controls to divide and contain dirty and clean water; 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.
Noise and vibration	– Blasting activities to take place during daylight hours, preferably in the afternoon; – Limit blasting activities on public holidays and Sunday; – Clearance at a radius of 500 m from the blasting site and 1 km from third parties; and – Monitor structures for damage and third party complaints.

3.3 ENVIRONMENTAL MONITORING

A monitoring and evaluation program will be used in line with ISO 14001 and 45001 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 is in place for the Navachab operations.

The monitoring program will comprise *inter alia*:

- Air quality monitoring;
- Noise and vibration monitoring;
- Water monitoring (e.g. surface water, groundwater, effluent water, potable water);
- Biodiversity monitoring (e.g. fauna, vegetation);
- Meteorological monitoring (e.g. climatic, rainfall and evaporation); and
- Archaeological monitoring.

The environmental officer will be tasked with conducting the monitoring with the support of the relevant domain manager(s).

3.4 ENVIRONMENTAL OBJECTIVES AND TARGETS

The following Navachab site environmental objectives and targets have been developed in order for activities on the Navachab site to minimise potential impacts on the environment as far as reasonably practicable.

- Zero pollution incidents;
- Sustainable resource use;
- Application of the waste management hierarchy;
- Sustainable use of water;
- Responsible disposal of waste;

- Minimise aerial discharges and dust being generated;
- Minimise noise and vibration levels; and
- Protect and enhance biodiversity.

Procedures for monitoring site activities against these environmental objectives are in place at Navachab. In addition, each year, annual targets or key performance indicators (KPIs) will be set in accordance with the company wide objectives. These KPIs will be captured in the bi-annual environmental reports(s) and the site's sustainability report. All employees will work towards these objectives and targets.

3.5 DOCUMENT CONTROL

Internal HSE performance standards are in place at Navachab and sets out requirements to ensure that necessary documentation, records, data and information exist to support the functionality and effectiveness of QKR Navachab Namibia.

All environmental records are maintained on the site's SharePoint and is made accessible across the organisation. All environmental monitoring data is stored on DataSight. This data is made available to all HODs. All records, reports and documents are maintained in accordance with the site's document control procedure.

4 COMMUNICATION AND TRAINING

In order to ensure potential aspects and impacts are minimised it is vital that personnel are appropriately informed and trained on how to properly implement the OEMP. It is also important that regular communication is maintained with stakeholders, employees and different levels of mine management to make all aware of potential impacts and how to manage it. This section sets out the framework for communication and training in relation to the OEMP.

4.1 COMMUNICATIONS

During exploration and operations, the respective domain managers or technical services manager shall communicate site-wide environmental issues to employees and contractors 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 OEMP;
- Ensuring audits and inspections are undertaken regularly on a risk-based schedule;
- Toolbox talks, including instruction on incident response procedures;
- Deliver specific environmental briefings where required;
- Ensure all personnel have access to the OEMP; and
- Ensure operators of key activities and environmentally sensitive operations are briefed and understand their requirements.

This OEMP will be distributed to the exploration and operations teams, including any contractors and other personnel working on the mine or in the EPLs, to ensure that all personnel are aware of the environmental responsibilities of Navachab. Key activities and environmentally sensitive operations will be clearly communicated to workers and contractors.

During the mining activities, communications among the management team members will include discussions of any complaints received and actions needed to resolve them; any non-conformances reported during inspections and/or audits; and any achievements related to objectives or targets.

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 is in place at Navachab and manages the response in relation to emergencies including environmental emergencies. Table 17 lists the emergency response numbers to be called at Navachab.

Table 17 – A list of emergency contact details for Navachab

Town	Ambulance	Police	Fire brigade
Karibib	+264 (64) 55-0073	Inspector Aino Imukusi	Fire Officer Mr Gift Sililo

		Tel: +264 (64) 550008 Cell: +264 812983226	Tel: +264 (64) 55-0020 Cell: +264 814221805
Site emergency response	055 2111 or 2111		

For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the Offices of the Ministry of Environment, Forestry and Tourism (MEFT) informed of the incident (telephone +264 61 284 2111). If hydrocarbon and petroleum spills of >200 L occur, the Ministry of Industries, Mines and Energy (MIME) must be informed and form PP/01 must be completed and submitted. If significant environmental spills (hydrocarbon or processing) occur close or in a water source, the Department of Water Affairs to be notified. All correspondence with the relevant ministries should be by the Mining director and the notification should occur no later than 48 hours after the incident has occurred. If the major spill occurs in the EPLs, the landowner needs to be informed immediately.

For the clean-up of smaller spills, the relevant 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

Internal performance standards of Navachab dictates that all incidents, near misses, complaints or concerns from members of the local community or other stakeholders will be reported in a timely and factual manner; accurately classified; effectively investigated; corrected and prevented from recurring through implementation of additional or more effective controls.

Any complaints received verbally by any personnel on the mine or in the EPLs will be recorded by the receiver, including the name and contact details of the complainant, date and time of the complaint, and the nature of the complaint. The information will be given to the Mining director, who is overall responsible for the management of complaints and will provide a written response to the complainant. The respective domain manager will inform the relevant line managers of issues, concerns or complaints. The line manager must maintain a complaints register that details the name of the complainant, date and time of the complaint, the action taken to resolve the issues and date of complaint handover.

The workforce will be informed about the complaints register, its location and the person responsible, to whom to refer residents or the general public who wish to lodge a complaint. The complainant will be informed in writing 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 will be recorded in the register and communicated.

The complaints register shall be kept for the duration of the life of mine and will be available for government or public review upon request.

4.4 TRAINING AND AWARENESS

All personnel working on the mine or EPLs will 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.

4.5 SITE INDUCTION

All personnel involved on the mine or in the EPLs shall be inducted to the site with a specific environmental awareness training and health and safety issues. The environmental and social awareness training shall ensure that personnel are familiar with the principles of this OEMP, 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 technical services manager shall ensure a register of completed inductions and site-specific environmental awareness training is maintained. The general site induction should include, but is not limited to the following:

- What is meant by “environment” and the OEMP;
- Why the environment needs to be protected and conserved;
- How can mining activities impact the environment;
- What can be done to mitigate against impacts;
- The inductee's role and responsibilities concerning implementing the OEMP;
- The site's environmental rules;
- Details of how to deal with, and who to contact should any environmental problems occur;
- The potential consequences of non-compliance with this OEMP and relevant statutory requirements; and,
- The role of responsible people for the operations.

5 INCIDENT REPORTING

Navachab Gold Mine has 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.

5.1 MINOR INCIDENT OR “NEAR MISS”

Any incident or “near miss” involving Navachab 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 supervisor or the supervisor’s nominated representative:
 - a. Immediately and without delay (within the same shift).
 - b. Regardless of whether or not injury to personnel has occurred.
 - c. Property or equipment has been damaged.
- 2) Written up and handed to the supervisor/line manager or the supervisors/line managers 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 INCIDENTS

For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched until witnessed by a representative of the Namibian 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 assigned supervisor/line 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, which should involve the technical services manager and/or his/her representative.

6 SPILL MANAGEMENT

The uncontrolled release of fuels, lubricants 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. Preventative measures to minimise the potential for a spill are listed below. Should a spill occur, this provides guidance for Navachab on the appropriate spill response measures.

The following management measures are to be implemented by Navachab:

- Spill kits are to be made available throughout the site and in the EPLs. The kits are to include, as a minimum, the following items:
 - Absorbent materials;
 - Chemical resistant shovels;
 - Heavy-duty chemical resistant plastic bags;
 - Protective clothing (e.g. gloves, respirators, goggles, etc.);
- Drip trays and movable spillage capture equipment to be used where appropriate;
- All machines to be subjected to preventative maintenance of hydraulic hoses, oil pumps and fittings to reduce the risk of spillage during operation;
- Major servicing of equipment will be undertaken in appropriately equipped workshops;
- Provision of adequate and frequent training on spill management, spill response and refuelling must be provided to all on-site staff;
- 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.) will be well maintained;
- Storage and handling of fuels and chemicals will 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.

The primary concern, in the event of any spill, is the health and safety of any residents and staff 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 and in the EPLs:

- Assess the situation for potential hazards;
- Do not come into contact with the spilled substance until it has been characterised and necessary PPE is provided;
- Isolate the area as required; and
- 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, plug holes or turn container upright);
- 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 appropriate facilities;
- The line manager or OHSE manager are to be informed as soon as possible in the event of a spill; and
- A written incident report must be submitted to the supervisor/line manager.
- Large spills must be reported immediately to the landowner and cleaned up within 24 hours to avoid degradation of the land, groundwater and potentially injury and/or death to flora and fauna.

7 COMPLIANCE AND ENFORCEMENT

7.1 ENVIRONMENTAL INSPECTIONS AND COMPLIANCE MONITORING

Inspections and audits of the site will be managed and undertaken by the respective domain manager(s), technical services manager and environmental officer(s) to check that the standards and procedures set out in this OEMP 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.

7.2 REPORTING

Statutory reports shall be submitted to the Mining Commissioner in terms of the Minerals (Mining and Prospecting) Act, No. 33 of 1992 and related conditions of ML 31, ML 180, the accessory works area of ML 31, EPL 999 and EPL 3275.

Bi-annual environmental reports shall be submitted to the Environmental Commissioner every six months of every year during the environmental clearance certificate validity period. These reports should include records of the monitoring and other deliverables of every aspect or programme described in the OEMP. Reports should be submitted within three months of the bi-annual period lapsing.

The application documentation for renewal of the environmental clearance certificate must include a summary environmental audit report and copies of the six bi-annual reports that will be submitted every six months for the three years that the clearance certificate is valid for.

7.3 WATER LICENCES

The Water Resources Management Act, No. 11 of 2013 and 2023 Regulations, gazetted in August 2023, governs water policy making and water resources management in Namibia and provides an improved framework for managing water resources based on the principles of integrated water resource management.

7.3.1 WASTEWATER TREATMENT, DISCHARGE AND REUSE LICENCE

In the event that the operations produce wastewater, a licence must be obtained from the Department of Water Affairs. Since Navachab is an operational mine, all licences related to wastewater are in place and being maintained as relevant.

7.3.2 WATER ABSTRACTION LICENCE

The mine is in the process of applying for the required abstraction licences from DWA.

7.4 NON-COMPLIANCE

Where it has been identified that works are not compliant with this OEMP, the respective domain manager will employ corrective actions so that the works return to being compliant as soon as possible. In instances where the requirements of the OEMP are not upheld, a non-conformance and corrective action notice will be produced. The notice will be generated during the inspections and the supervisor/line 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 OEMP and associated indicators or objectives.
- The supervisor/line manager and or contractor have failed to comply with corrective or other instructions issued by the environmental manager or qualified authority.
- The supervisor/line manager and or contractor failed 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.

7.5 DISCIPLINARY ACTION

This OEMP is a legally binding document and any wilful non-compliance with it may result in action being taken against the perpetrator(s) within the provisions of company policy, terms of commercial contracts and/or relevant laws in Namibia. Such action may take the form of (but is not limited to):

- Fines / penalties;
- Legal action;
- Penalties imposed by the Proponent on the contractor;
- Suspension or withdrawal of authorisations;
- Suspension of work; and
- Non-renewal of environmental clearance certificate.

The appropriate 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.

8 MONITORING PROGRAMMES

8.1 AIR QUALITY MONITORING

Due to a lack of guidelines on ambient air quality standards in Namibia, the depositional dust monitoring results will be compared to the fall out dust limits as provided by the South African National Standard (SANS) limit of 1200 mg/m²/day as an average value over a 28 – 32 day period, for industrial areas (

Table 18 and Table 19).

Air quality monitoring locations are currently established on the mine site and set up according to the American Society for Testing and Materials Standard (ASTM D1739-98) method for collection and analysis of gravimetric fall out dust (TSP). Depositional dust stations are presented in Figure 15. N following the NAQ number represents new dust gauge stations allocated/exposed or dust station relocated from original location. There are 12 dust gauge stations set up (NAQ01 – NAQ12) in and around the mine site, that are exchanged on a monthly basis, by Navachab environmental section staff.

Additionally, on a quarterly basis, depositional dust samples are sent to an accredited third-party laboratory in South Africa to test for alpha quartz (silica). A once off total metals (ICP) analysis was conducted in March 2023 on the depositional dust samples.

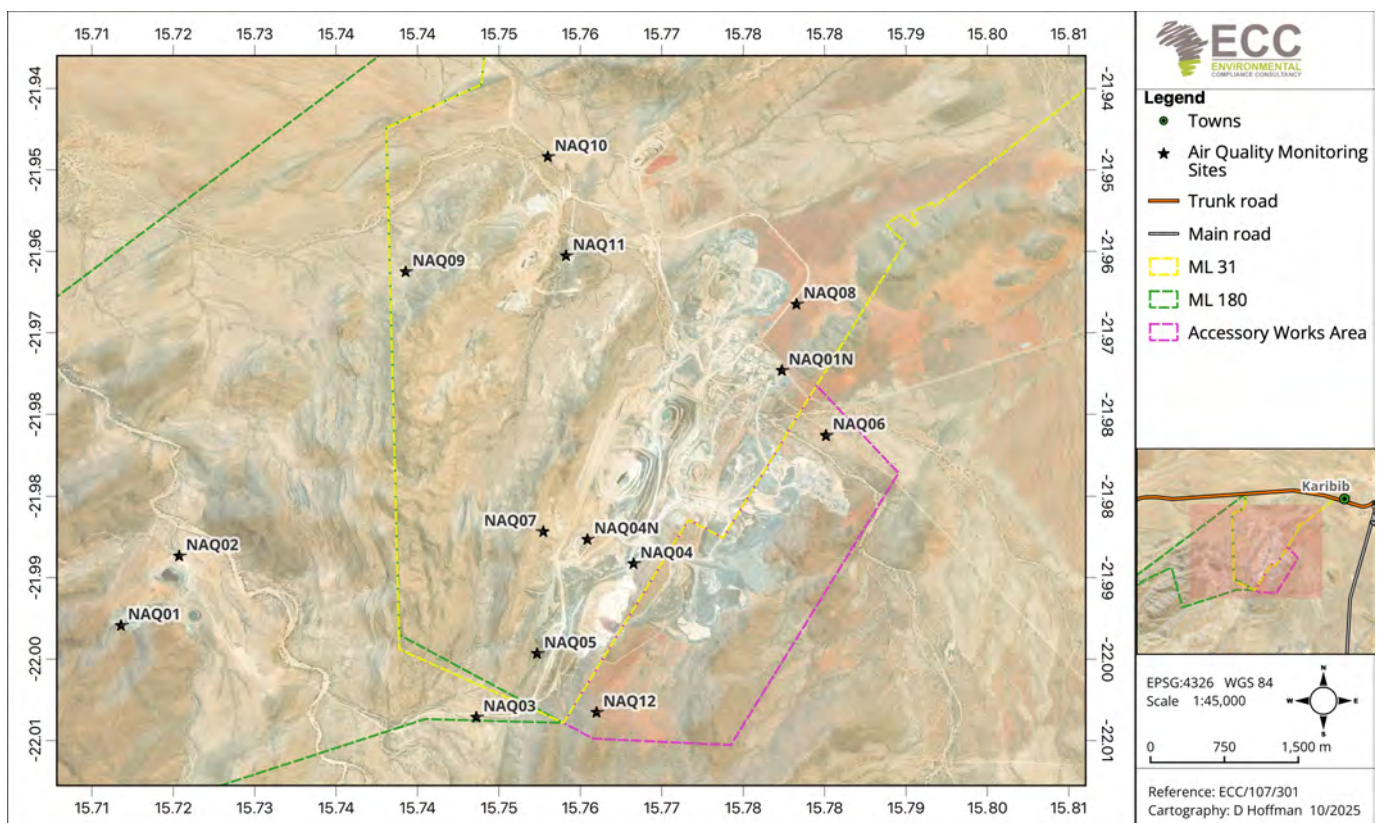


Figure 15 – Depositional (fall out) dust bucket locations on Navachab Gold Mine

Table 18 – SANS (1929:2011) ambient air quality evaluation criteria for dust deposition

Band number	Band description	Dust rate (d) mg/m ² /day	Comment
1	Residential	$D < 600$	Permissible for residential and light commercial.
2	Industrial	$600 < D < 1200$	Permissible for heavy commercial and industrial.
3	Action	$1200 < D < 2400$	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	$2400 < D$	Immediate action and remediation required following the first incidence of dust fallout rate being exceeded. Incident report to be submitted to the relevant authority.

Table 19 – The target, action and alert threshold values from the SANS 1929:2011 ambient air quality monitoring standard

Level	Dust fall rate (mg/m ² /day)	Averaging period	Permitted frequency of exceeding dust fall rate
Target	300	Annual	
Action residential	$D < 600$	30 days	Three within any year, no two sequential months
Action industrial	$D < 1200$	30 days	Three within any year, not sequential months
Alert threshold	$D < 2400$	30 days	None. First incidence of dust fall rate exceeded requires remediation and compulsory report to relevant authorities

The following additions to the monitoring network is recommended for mining operations:

- Passive sampling, which includes exposing and collecting SO₂, NO₂, VOCs and hydrogen fluoride. These sites will coincide with the dust bucket locations and is recommended to be conducted three times a year;
- PM₁₀ and PM_{2.5} monitoring of particulate matter, particularly on the northeastern boundary of the mine property, to measure pollutants moving from the mine to Karibib (e.g. mine offices, near the main gate);
- Gas monitoring procedures for the underground mining operations;
- Greenhouse gas emissions to be determined and recorded and related inventory to be developed;
- The dust collected in the depositional stations are in small quantities and bi-annual testing for total metals would be an advantage; and
- It is therefore advised to take soil samples (1 kg) every two years from predetermined locations to determine the metals content of a large sample size.

Due to a lack of standards in Namibia, the best practise standards for mining operations in Namibia to be complied with are provided in Table 20 below.

Table 20 – Air quality criteria for passive gases and particulate matter

Parameter	Average	Criteria	Origin
PM_{2.5}	24-hour mean (µg/m ³)	37.5 (1)	WHO IT3 & SA Standard
	Annual mean (µg/m ³)	15	WHO IT3
PM₁₀	24-hour mean (µg/m ³)	75 (1)	WHO IT3 & SA Standard
	Annual mean (µg/m ³)	30	WHO IT3
SO₂	1-hour mean (µg/m ³)	350 (1)	EC Limit & SA Standard (no WHO guideline)
	24-hour mean (µg/m ³)	50 (2)	WHO IT2 (seen as a per 40% of the SA and EC limits)
	Annual mean (µg/m ³)	50	SA Standard (no WHO guideline)
NO₂	1-hour mean (µg/m ³)	200 (2)	WHO AQG & EC & SA Standard
	Annual mean (µg/m ³)	40	WHO AQG & EC & SA Standard
VOC (benzene)	Annual mean (µg/m ³)	5	SA Standard (no WHO guideline)
VOC (toluene)	Hourly mean (µg/m ³)	640	TCEQ Short-term ELS
VOC (ethyl benzene)	Hourly mean (µg/m ³)	2560	TCEQ Short-term ELS
VOC (xylene)	Hourly mean (µg/m ³)	350	TCEQ Short-term ELS
HF (hydrogen fluoride)	1-hour mean (µg/m ³)	18	TCEQ Short-term ELS
	Annual mean (µg/m ³)	8.7	TCEQ Short-term ELS

* Notes: (1) Not to be exceeded more than 4 times per year (SA); (2) Not to be exceeded more than 3 times per year.

Air quality monitoring results should be reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT.

8.2 METEOROLOGICAL MONITORING

Meteorological monitoring is an important management tool that provides additional insight into understanding and evaluating air quality trends and rainfall patterns for a specific site. Additionally, active live monitoring can assist health and safety decision making for task risk analysis (e.g. lifting operations). Navachab utilise a live weather station that acquires data for the Karibib area. Data should be downloaded on a weekly and monthly basis and added to the monitoring database.

Additionally in line with continual improvement, an onsite daily weather log can be developed and maintained, whereby abnormal conditions can be logged and recorded (e.g. blasting, strong winds). This will provide additional insight into analysing air quality trends when results are received and assist with management decision making.

Meteorological monitoring results should be reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT.

8.3 NOISE AND VIBRATION MONITORING

Noise and vibration monitoring should be conducted on regular basis, at pre-determined third-party locations, in close vicinity to mining operations. Monthly monitoring is preferred. Ground vibrations measured should be less than 12 mm/s peak particle velocity. Air blasts measured should be less than 130 dB. The equipment used for this monitoring must be calibrated on an annual basis as per ISO 14001 standards. Locations and structures in and around the mine can also be monitored, however the velocity and sound measurements will differ dependent on the distance from blasting operations.

Noise and vibration monitoring results should be reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT.

From 2025, noise monitoring will be conducted on a bi-annual basis at pre-determined locations, as required by operational activities. The current selected locations are at existing depositional dust gauge stations (NAQ01, NAQ02, NAQ03, NAQ04, NAQ05 and NAQ12) (Figure 15).

8.4 GROUNDWATER MONITORING

Navachab has an existing groundwater monitoring network, with boreholes located in the mining area, non-mining areas and on neighbouring farms. The current monitoring network comprises 39 monitoring boreholes. Figure 16 provides an overview of the current groundwater monitoring borehole locations on Navachab Gold Mine. Groundwater monitoring locations for TSF 3 will be incorporated into the overall design and where required additional boreholes will be drilled within seepage pathways for ongoing monitoring. Additional groundwater monitoring locations will be determined based on the TSF 3 operational manual and will be updated as the TSF 3 operations progress.

8.4.1 GROUNDWATER LEVEL MONITORING

Monitoring of groundwater levels is conducted to determine groundwater flow direction, seasonal patterns and aquifer responses to recharge and/or abstraction. Decreasing trends in rest water levels may offer an indication of over abstraction and stress to an aquifer, while increases may alert of potential in-rush or flooding. Rest water levels are recorded monthly by Navachab environmental staff and quarterly by a third-party environmental practitioner, ECC.

8.4.2 GROUNDWATER QUALITY MONITORING

Water quality is assessed and compared to the Water Resources Management Act No. 11 of 2013 and its associated 2023 Regulations (Annexure 1) (Table 22). Navachab are required to comply with the monitoring requirements stipulated in the Table 21, in order to comply with the preliminary wastewater and effluent discharge licence No. 624 conditions, that has been granted by the Department of Water Affairs on 10 April 2024. Additionally, Navachab monitors the groundwater network either on a monthly or quarterly basis. Groundwater samples should be analysed by an external lab and periodically by an accredited laboratory, as per ISO 14001 standards. Sampling is conducted quarterly by a third-party environmental practitioner, ECC.

Table 21 – New requirements according to the preliminary wastewater and effluent discharge licence No. 624 conditions

Clause 41	Requirement
Monthly sampling	Old TSF (i.e. TSF 1) monitoring boreholes DW22, P375, P376, TSF BH: W1, TSF BH: W2 will be analysed for pH, CN, sulphates, magnesium hardness, calcium hardness, magnesium, calcium, conductivity and total dissolved solids, manganese, lead, zinc, chloride, ammonia, nitrate, nitrite, sodium, potassium, ortho-phosphate, sulphine aluminium, antimony, arsenic, boron, barium, beryllium, bismuth, cadmium, copper, chromium, gold, cobalt, mercury, molybdenum, nickel, silver, selenium, strontium, silicone, sulphur, uranium, vanadium and iron.
Quarterly sampling	New TSF (i.e. TSF 2) monitoring boreholes WW33135, WWW30598 and WWW30597, WWW30599, TSF BH2. TSF BH3 and Gecko BH WBH will be analysed for pH, CN, sulphates, magnesium hardness, calcium hardness, magnesium, calcium, conductivity and total dissolved solids, manganese, lead, zinc, chloride, ammonia, nitrate, nitrite, sodium, potassium, ortho-phosphate, sulphide, aluminium, antimony, arsenic, boron, barium, beryllium, bismuth, cadmium, copper, chromium, gold, cobalt, mercury, molybdenum, nickel, silver, selenium, strontium, silicon, sulphur, uranium, vanadium and iron.

Groundwater monitoring results should be reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT. Additionally, reports are submitted to the Department of Water Affairs in line with issued licence conditions.

8.4.3 PIT ABSTRACTION MONITORING

Pit dewatering should be conducted on a monthly basis and records of the flow meter volumes to be maintained. Reporting to the Department of Water Affairs to take place on a monthly or quarterly basis, as per approved and valid licence conditions.

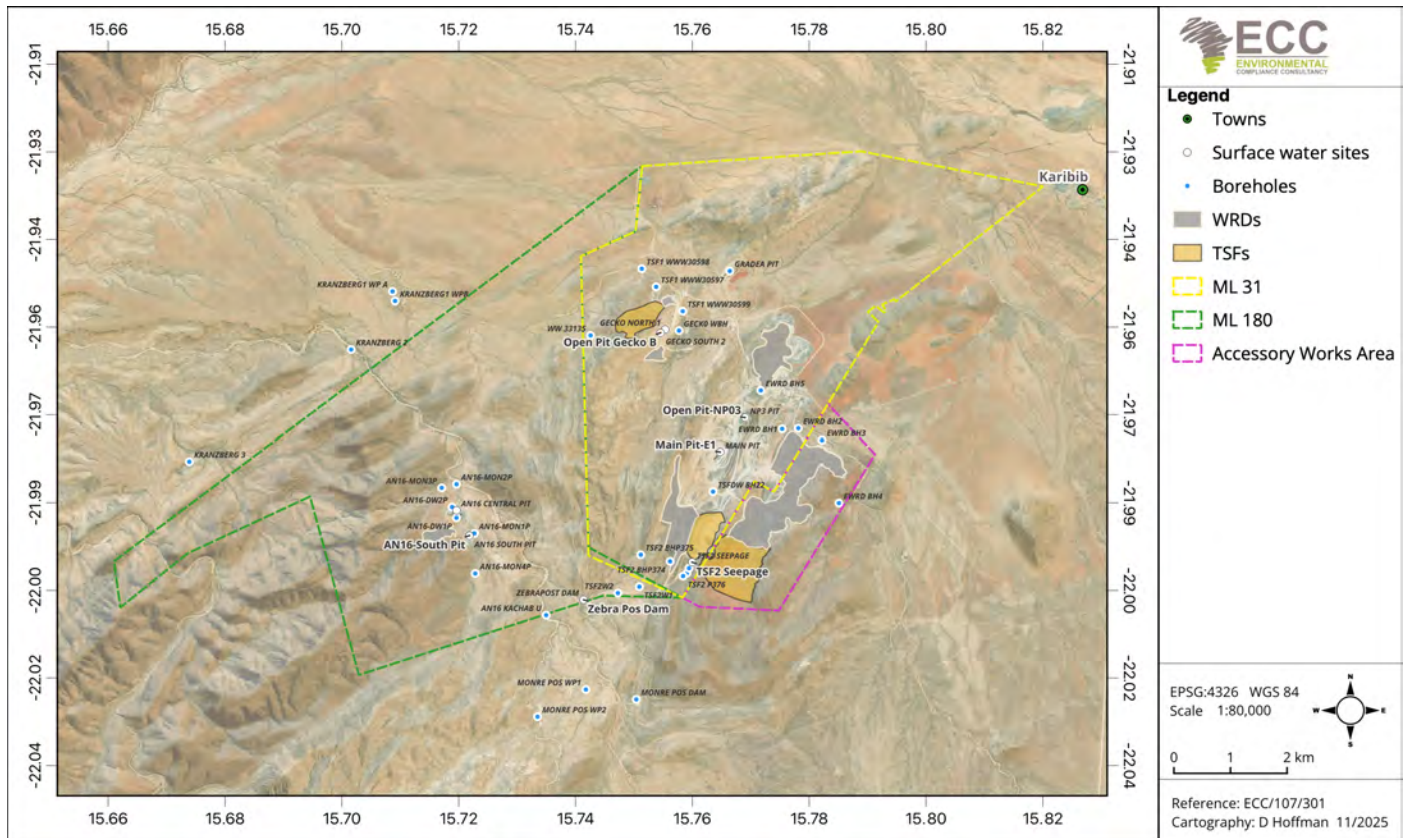


Figure 16 - Groundwater monitoring network on Navachab Gold Mine

Table 22 – New requirements according to the Water Resources Management Act, 2013 (No. 11 of 2013) (2023 Regulations Annexure 1)

Parameter	Units	Ideal guideline	Acceptable standard
pH	pH	6 - 8.5	60 - 9
Electrical conductivity	mS/m	<80	<300
Turbidity	NTU	<0.5	<2
Total dissolved solids (calc.)	mg/l	<500	<2 000
P-alkalinity as CaCO ₃	mg/l		
Total alkalinity as CaCO ₃	mg/l		
Total hardness as CaCO ₃	mg/l	300	650

Parameter	Units	Ideal guideline	Acceptable standard
Ca-hardness as CaCO ₃	mg/l	375	500
Mg-hardness as CaCO ₃	mg/l	290	420
Chloride as Cl ⁻	mg/l	<100	<300
Fluoride as F ⁻	mg/l	<0.7	<2
Sulphate as SO ₄ ²⁻	mg/l	100	<300
Nitrate as N	mg/l	<6	<11
Nitrite as N	mg/l	<0.2	<0.5
Sodium as Na	mg/l	<100	<300
Potassium as K	mg/l	<25	<100
Magnesium as Mg	mg/l	<30	<70
Calcium as Ca	mg/l	<80	<150
Manganese as Mn	mg/l	<0.05	<0.1
Lead as Pb	mg/l	<0.01	<0.05
Iron as Fe	mg/l	<0.2	<0.3
Copper as Cu	mg/l	<0.5	<2
Molybdenum	mg/l	0.05	0.10
Zinc as Zn	mg/l	<1	<5
Chromium as Cr	mg/l	<0.05	<0.1
Cadmium as Cd	mg/l	<0.005	0.01
Cobalt as Co	mg/l	<0.25	<0.5
Nickel as Ni	mg/l	<0.05	<0.15
Arsenic as As	mg/l	<0.01	<0.05
Aluminium as Al	mg/l	<0.025	<0.1
Antimony as Sb	mg/l	<0.005	<0.05
Barium as Ba	mg/l	0.005	<0.002

Parameter	Units	Ideal guideline	Acceptable standard
Beryllium as Be	mg/l	<0.002	<0.005
Bismuth as Bi	mg/l	<0.25	<0.5
Boron as B	mg/l	<0.3	<0.5
Bromide as Br	mg/l	<0.5	<1
Cerium as Ce	mg/l	<1	<2
Cesium as Cs	mg/l	<1	<2
Cyanide free as CN	mg/l	<0.02	<0.05
Selenium as Se	mg/l	<0.01	<0.05
Mercury as Hg	mg/l	<0.001	<0.002
Thallium as Ti	mg/l	<0.005	<0.01
Tin as Sn	mg/l	<0.1	<0.2
Titanium as Ti	mg/	<0.1	<0.2
Uranium as U	mg/l	<0.003	<0.015
Vanadium as V	mg/l	<0.1	<0.5
Stability pH, at 25°C			
Langelier Index		>0=scaling, <0=corrosive, 0=stable	
Ryznar IndexCou		<6.5=scaling, >7,5=corrosive, >6.5 and <7.5=stable	
Corrosivity ratio		Applies to water in the pH range 7-8	

8.5 SURFACE WATER MONITORING

Surface water sampling can be used as an additional tool to determine potential contamination or acid rock drainage as a result of mining related activities. Water samples are collected for further laboratory analysis and can be compared directly to the perceived source. Surface water samples preferred collection is in the form of water, however muddy samples can also be collected for analysis. Surface water samples can be collected from on-site ponds, natural streams/drainage lines with an active flow and following a rainfall event on the mine site. Surface water quality monitoring locations will include the TSF 3 decant water once the TSF is operational. Additional surface water monitoring locations will be determined based on the TSF 3 operational manual and will be updated as the TSF 3 operations progress.

Surface water quality is assessed and compared to the Water Resources Management Act, 2013 (No. 11 of 2013) (2023 Regulations Annexure 1) (Table 22).

Surface water monitoring results should be reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT.

8.6 POTABLE WATER MONITORING

Navachab receives its bulk water supply from the Swakoppoort Dam via an established pipeline. An agreement exists between NamWater and Navachab for this supply. The processing plant is the main consumer of water at the mine.

Potable water samples are taken from five locations (Admin, Clinic Pre Filter, Clinic Post Filter, Geo Camp and Karibib Town Council) or ad hoc, as required, and are compared to the Water Resources Management Act, 2013 (No. 11 of 2013) (2023 Regulations Annexure 1) (Table 22) (note additional requirements can be referenced in the Regulations directly and the full list is not presented in this table). Samples should be taken on a monthly or quarterly basis and should be analysed by an external lab and periodically by an accredited laboratory, as per ISO 14001 standards.

Potable water monitoring results should be reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT.

8.7 WASTEWATER AND EFFLUENT MONITORING

Navachab have been issued by the Department of Water Affairs with a preliminary wastewater and effluent discharge licence on 10 April 2024, licence No. 624, for 18 months. The new application has been submitted to DWA for further processing. Navachab have different systems in place to manage the various effluent streams. These systems are described below:

- Trickling Filter Plant to treat sewage from the carbon in pulp (CIP) plant, engineering workshops, dense media separation system (previously PCP) and administration buildings;
- Lewcor wetland system to act as a water recovery system for the Lewcor workshop and Navachab clinic; and
- A septic tank system with a French drain utilised for remote areas (pit control, BME, TSF 2, crusher and Gecko farmhouse).

Each system is required to be monitored on a regular basis and effluent samples analysed (monthly to quarterly) to determine if effluent is compliant with the general standards for industrial effluents as per the Water Resource Management Act No. 11 of 2013 and associated 2023 Regulations (Annexure 11) (Table 23). This is especially important for effluents that are released back into the environment, either as dust suppression or directly into streams/channels. Currently 11 sample locations are available for analysis (Figure 17).

Wastewater and effluent monitoring results should be reported on a monthly basis internally, when required to DWA as per licence conditions and be included in the bi-annual environmental performance report to MEFT.

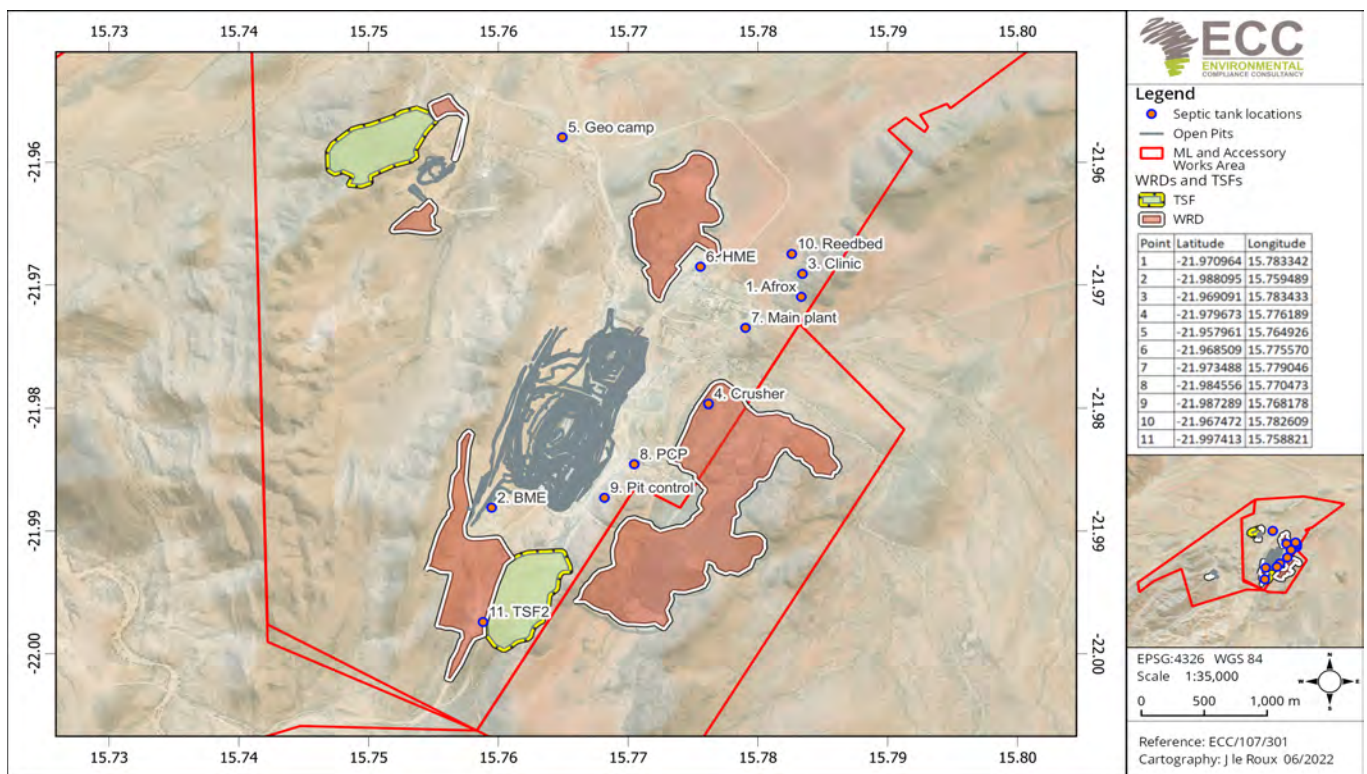


Figure 17 - Sewage sampling locations and network on Navachab Gold Mine

Table 23 – New requirements according to the Water Resources Management Act, 2013 (No. 11 of 2013) (2023 Regulations Annexure 1)

Parameter	Units	Special standard	General standard
Arsenic	mg/l	<0.05	<0.15
Total hardness	mg/l		
Biological oxygen demand (BOD)	mg/l	<10	<30
Boron	mg/l	<0.5	<1
Chemical oxygen demand (COD)	mg/l	<45	<100
Chlorine	mg/l	< 40 mg/litre above the intake potable water quality	<70 mg/litre above the intake potable water quality
Chromium, hexavalent	mg/l	<0.01	<0.05
Chromium, total	mg/l	<0.05	<1
Barium	mg/l	<0.05	<0.2
Aluminium	mg/l	<0.025	<0.2
Antimony	mg/l	<0.005	<0.05
Copper	mg/l	<0.5	<2
Selenium	mg/l	<0.01	<0.05
Cadmium	mg/l	<0.005	<0.05
Ammonia	mg/l	<1	<10
Nitrate	mg/l	<15	20
Nitrite	mg/l	<2	<3
Total kjeldahl nitrogen	mg/l	<18	<33
Cyanide free	mg/l	<0.03	0.1
Cyanide (recoverable)	mg/l	<0.07	<0.2
Aldehyde	mg/l	<0.05	<0.1
Adsorbable organic halogen	mg/l	<0.05	<0.1

Parameter	Units	Special standard	General standard
Oxygen, dissolved (DO)	% saturation	>75	>75
Detergents (soap)	mg/l	<0.2	<3
Fats, oil & grease (FOG)	mg/l	nil	<2.5
Fluoride	mg/l	1.0	2.0
Lead	mg/l	<0.01	<0.1
pH		6.5 – 9.5	6.5 – 9.5
Colour	mg/l Pt	<10	<15
Electrical conductivity	mS/m	<75 mS/m above the intake potable water quality	
Phenolic compounds	mg/l	<0.01	<0.10
Phosphate			
Sodium	mg/l	< 50 mg/litre above the intake potable water quality	<90 mg/litre above the intake potable water quality
Sulphide	mg/l	<0.05	<0.5
Temperature		Not higher than 10P ^{OP} C higher than the recipient water body	
Total dissolved solids (TDS)	°C	< 500 mg/litre above the intake potable water quality	
Total suspended solids (TSS)		<0.025	<0.1
Soluble ortho phosphate	mg/l	<0.2	0.3
Zinc	mg/l	1	5

8.8 BIODIVERSITY MONITORING

Biodiversity monitoring requirements are related to the various ESIA outcomes and studies conducted for Navachab Gold Mine and will be amended as required when new information becomes available.

Some of the basic monitoring requirements are listed below:

- Monitor animal movement at strategic locations and points throughout the life of mine and where feasible in the EPLs. An animal sightings register has been established in this regard.
- Monitor the plant health of pre-selected vegetation and riparian trees.
- Implement strategies to contain animals seen as pests (e.g. rats, cockroaches, baboons).
- Monitor the use of drainage lines, tributaries and rivers by fauna.
- Record and investigated fauna injuries and mortalities.
- Implement strategies to reduce fauna and avifauna to be attracted to ponds and tailing storage facilities.
- Monitor power line structures for avifauna activity, injuries and/or mortalities.
- Implement and maintain an on-site nursery for restoration and rehabilitation trials and purposes, in line with mine closure objectives and the 2025 developed Rehabilitation Plan and closure scheduling.
- Identified protected trees to be visibly demarcated/marked and monitored.
- Where trees are removed for pit development or in the EPLs for drill site establishment, seeds and cuttings to be collected for nursery planting.
- Monitor invasive and alien invasive species and remove when required (e.g. *Prosopis* sp, *Leucaena leucocephala* (Wonderboom), *Nicotiana glauca*) and prevent the planting of these species.
- Investigation offsetting, as and when required.
- Remove unique and sensitive fauna and flora (e.g. *Moringa ovalifolia*) before commencing with the TSF 3 developmental activities and relocate to a less sensitive/disturbed sites in the immediate area.
- Incorporate indigenous vegetation, especially protected species (e.g. *Moringa ovalifolia*) into the overall landscaping of TSF 3.

Biodiversity monitoring results should be reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT.

8.9 ARCHAEOLOGICAL MONITORING

Known archaeological sites on Navachab Gold Mine can be viewed in Figure 18. Known sites that have the potential to be damaged by operational activities should be monitored on a regular basis (ML 31 sites QRS 114/7 and 114/8) and three sites at TSF 3 (QRS 340/1089, 340/1090 and 340/1091). The sites will be buried as tailings accumulate in the shallow valley selected for this purpose. QRS 340/1089 represents a burial (grave site), the other two sites are minor sites of no significance.

Dependent on the location of QRS sites to operational or exploration activities, this monitoring can either be monthly or quarterly. Photographic and GPS records to be maintained of these sites. Where damages have been observed, an incident to be recorded and report to be maintained on the EMS database. Where a chance find has been found, the chance find procedure to be implemented and where necessary a specialist to be contacted to assess the site.

Archaeological monitoring results should be reported on a regular basis internally and be included in the bi-annual environmental performance report to MEFT. Heritage consent approvals for TSF 3 activities should be renewed on a regular basis (if required) and all conditions, including reporting, stipulated therein adhered too.

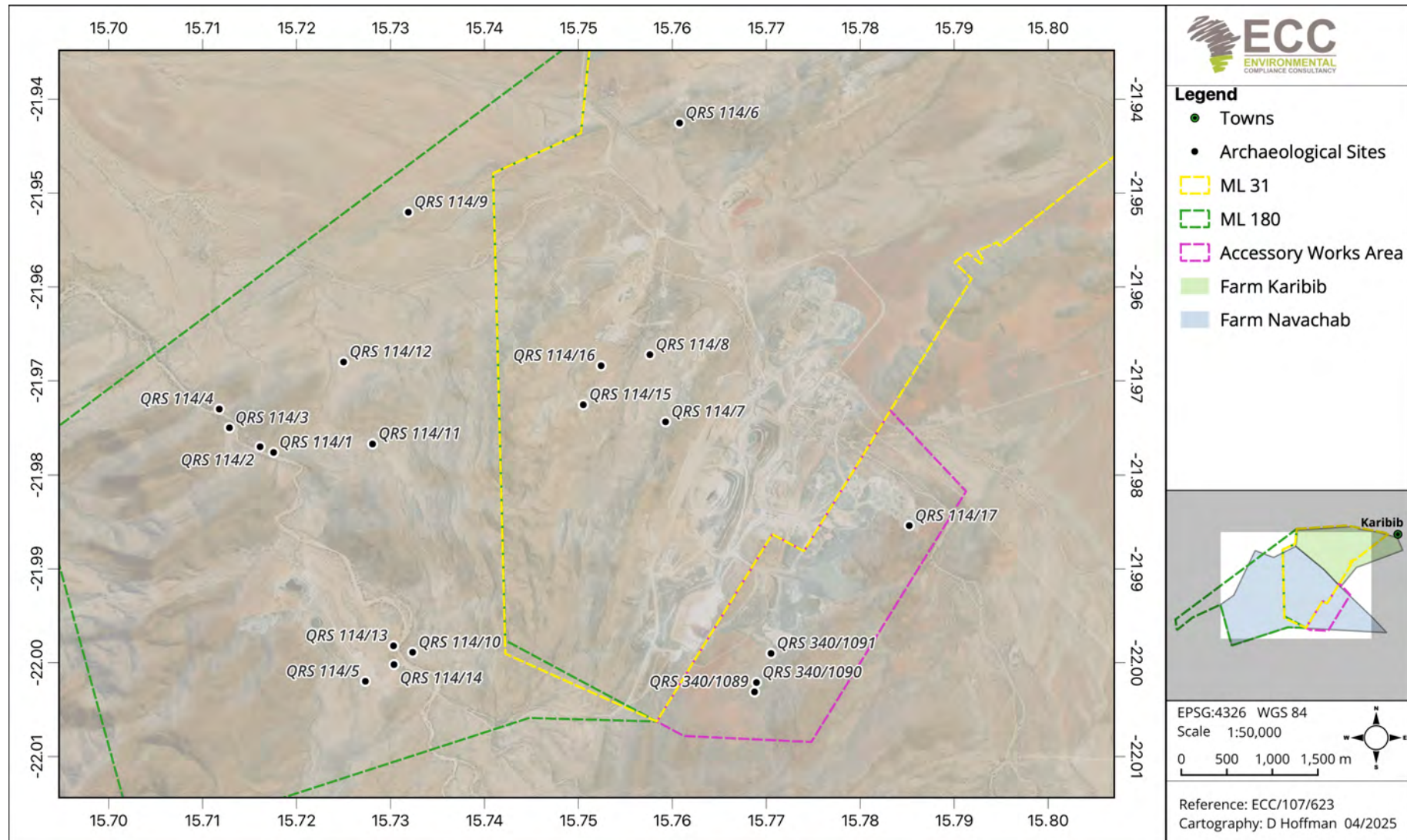


Figure 18 – Archaeological sites (known) located on Navachab Gold Mine

9 IMPLEMENTATION OF THE OEMP

This operational environmental management plan:

- A. Has been prepared according to the scope of work and terms of appointment issued to the EAP by the Proponent. This is version 02 of the OEMP;
- B. Has been prepared based on information provided to or obtained by ECC up to November 2025;
- C. Is for the sole use of the Proponent, for the sole purpose of an OEMP;
- D. Must not be used (1) by any person other than the Proponent or (2) for a purpose other than an OEMP;
- E. Must not be copied without the prior written permission of ECC; and
- F. Will be updated pending the outcomes of any future impact assessment process for an environmental clearance certificate and/or renewal thereof, as this is a live document.