



Kombat Mine

**Environmental Management Plan for the Proposed
Open Pit Mining and Dewatering for Underground
Exploration Activities at the Kombat Mine**

April 2021

Trigon Mining (Namibia) (Pty) Ltd

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ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED OPEN PIT MINING AND DEWATERING FOR UNDERGROUND EXPLORATION ACTIVITIES AT THE KOMBAT MINE

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ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED KOMBAT OPEN PIT MINING AND DEWATERING FOR UNDERGROUND EXPLORATION ACTIVITIES

1 INTRODUCTION

This Environmental Management Plan (EMP) documents a series of individual management plans (MPs) which are designed to meet legal requirements, avoid, minimise or manage the impacts associated with the implementation of the proposed Kombat open pit mining and dewatering for underground exploration activities. A Scoping Report (and assessment) has been produced by SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR) to cater for the potential environmental issues associated with the open pit mining and dewatering for underground exploration activities which Trigon Mining (Namibia) (Pty) Ltd (Trigon), previously Manila Investments (Pty) Ltd (Manila), is proposing.

The management plans recommended by the individual specialists form part of the scoping and assessment process and have been compiled into this EMP (refer to Table 1-1).

The EMP gives the commitments, which form the 'environmental contract' between Trigon and the Government of the Republic of Namibia; represented by the Ministry of Environment, Forestry and Tourism (MEFT).

1.1 KEEPING EMPs CURRENT

Section 50 (g) of the Minerals (Mining and Prospecting) Act, 33 of 1992 states that the holder of a mining license shall undertake a periodic review of the EMP(s) should circumstances change.

Should a listed activity(s) as defined in the Environmental Impact Assessment Regulations: Environmental Management Act (EMA), 2007 (Government Gazette No. 4878) be triggered (as a result of future modifications/changes at the mine), this EMP will be required to be updated through another EIA process as stipulated in the EMA and its Regulations.

Furthermore, proposed amendments to the approved activities (and facilities) need to be re-assessed and the EMP amended, as and where required.

1.2 DETAILS OF THE COMPANY WHO PREPARED THIS EMP

SLR Namibia (Pty) Ltd (SLR), the independent firm of consultants who compiled the Kombat Open Pit Mining and Dewatering for Underground Exploration Activities Scoping Report also compiled the original EMP in 2018.

This EMP has been updated by Trigon assisted by Namisun Environmental Projects and Development.

TABLE 1-1: SUMMARY OF ISSUES IDENTIFIED IN THE SPECIALIST AND THE SCOPING REPORTS AND CORRESPONDING MANAGEMENT PLANS

Environmental component (reference to Section 7 of the Scoping Report)	Issue (reference to Section 7 of the Scoping Report)	Relevant MP (reference to Section 6 of the EMP)
Third parties' (and animals) safety	Surface excavations and infrastructure ; and movement of mining vehicles	MP7.1 – Stakeholder consultation MP7.2 – Third Party Safety & Security
	Flyrock from blasting	
Soils and land capability	Loss of soil resources from soil pollution	MP7.14 – Waste management
	Loss of soils resource through physical disturbance	MP13 – Soil management
Biodiversity – Natural vegetation and animal life	General disturbance and Physical impacts on biodiversity	MP7.7 – Biodiversity MP7.14 – Waste management
	Spread of alien invasive plant species	MP7.7 – Biodiversity
Surface water	Altering drainage patterns	MP7.3 – Surface Water
	Impacts on surface water quality	MP7.3 – Surface Water MP7.14 – Waste Management
Groundwater	Groundwater abstraction	MP7.4 – Groundwater MP7.11 – Socio-Economic
	Impacts on groundwater quality	MP7.4 – Groundwater MP7.14 – Waste management
Air quality	Air pollution	MP7.5 – Air quality
Noise and vibrations	Noise pollution	MP7.6 – Noise and Vibrations
	Blasting vibrations and airblast side effects	
Archaeology	Impacts on archaeological resources	MP7.9 – Archaeology
Visual	Visual impact	MP7.8 – Visual
Socio-economic	Economic (income and employment) impact due to change of land use	MP7.1 – Stakeholder consultation MP7.2 – Third Party Safety & Security
	Social impact of Change of Land Use	
	Impact on surrounding land users	MP7.11 – Socio-Economic
	Employment and skills development	
	Community health, safety and security	
Traffic	Traffic Impact	MP7.10 - Traffic

2 SCOPE OF EMP

The components of the EMP are included in Table 2-1 below.

TABLE 2-1: CONTENT OF THE EMP

EIA Regulation requirement	EMP Reference
Details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section 1.1
Information on any proposed management or mitigation measures to address the environmental impacts that have been identified in a report contemplated by these regulations, including environmental impacts or objectives in respect of – <ul style="list-style-type: none"> i. Planning and design ii. Construction activities iii. Operation or undertaking of the activity iv. Rehabilitation of the environment v. Closure, where relevant 	Section 7
A detailed description of the aspects of the activity that are covered by the EMP.	Sections 4 & 5
An identification of the persons to be responsible for the implementation of the mitigation measures.	Sections 5 & 8
Where appropriate, time frames within which the measures contemplated in the EMP must be implemented.	Section 8
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section 7 & 9

3 ENVIRONMENTAL LEGISLATION

3.1 INTRODUCTION

Trigon complies with all Namibian legislation, and where legislation is lacking will comply with international best practice procedures. Table 3-1 provides a summary list of the relevant legislation applicable to the Kombat Open Pit Mine.

TABLE 3-1: LIST OF LEGISLATION RELEVANT TO MINING IN NAMIBIA

Year	Name
Current Namibian legislation & Bills	
1990	Petroleum Products and Energy Act No. 13 of 1990, as amended
1990	The Constitution of the Republic of Namibia of 1990
1992	The Labour Act, No. 6 of 1992
1992	The Minerals (Prospecting and Mining) Act No. 13 of 1992
1997	Regulations relating to the Health and Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act, No. 6 of 1992 (GN156, GG 1617 of 1 August 1997)
1998	Affirmative Action (Employment) Act No. 29 of 1998
1997	Namibian Water Corporation Act, No. 12 of 1997
1998	The Health Act No. 21 of 1998
1999	Road Traffic and Transport Act No. 22 of 1999
2000	Petroleum Products regulations
2000	Electricity Act No. 2 of 2000
2000	Explosives Act of 2000
2001	The Forestry Act No. 12 of 2001
2003	Pollution control and waste management bill, 2004
2004	Water Resources Management Act, 2004
2004	National Heritage Act No. 27 of 2004
2007	Labour Act No. 11 of 2007
2005	Atomic Energy and Radiation Protection Act No. 5 of 2005
2007	Electricity Act, No, 4 of 2007
2007	Environmental Management Act No. 7 of 2007
2013	Water Resources Management Act, (Act No. 11 of 2013)
Former South African and SWA legislation still applicable in Namibia	
1919	Public Health Act No. 36 of 1919

Year	Name
1956	Water Act No. 54 of 1956
1956	Explosives Act No. 26 of 1956
	Regulations promulgated in terms of the Explosives Act No. 26 of 1956
1968	Regulations made under the provisions of the Mines, Works and Minerals ordinance, 1968 (Ordinance 20 of 1968)
1969	Soil Conservation Act No. 76 of 1969
1974	Hazardous Substances Ordinance No. 14 of 1974
1975	Nature Conservation Ordinance No. 14 of 1975
1976	Atmospheric Pollution Prevention Ordinance No. 11 of 1976
Namibian policy	
1994	Policy for the Conservation of Biotic Diversity and Habitat Protection
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation
1998	Draft White Paper on the Energy Policy of Namibia
1999	Policy for Prospecting and Mining in Protected Areas and National Monuments
2000	National Water Policy White Paper
2004	Minerals Policy for Namibia
International law to which Namibia is a signatory	
1985	Vienna Convention for the Protection of the Ozone Layer
1987	Montreal Protocol on substances that deplete the Ozone Layer
1989	The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal
1989	The Rotterdam convention on the Prior Informed Consent Procedure for Certain Hazardous chemicals and Pesticides in International Trade
1992	The Rio de Janeiro Convention on Biological Diversity
1992	United Nations Framework Convention on Climate Change

3.2 PERMITS AND APPROVALS

Trigon Mining (Namibia) (Pty) Ltd, an indirect subsidiary of Trigon Metals Inc., holds Mining Licenses 73B, 16, 9 (collectively the old Kombat Copper mine, which is currently under care and maintenance), 73C (the Gross Otavi project) and 21 (the Harasib project). The Mining Licences were transferred to Manila (now Trigon) in April 2012. Trigon Metals Inc., through its 80% shareholding in Trigon, owns 80% of the Kombat

Mine while Epangelo Mining Company (Pty) Ltd (Namibia) and Havana Investments (Pty) Ltd each own 10%.

The mine is located close to the town of Kombat on the southern margin of the Otavi Mountain Range in northern Namibia in the Otjozondjupa region, approximately 41 kilometres (km) east of Otavi on the B8 Road to Grootfontein.

Trigon is considering implementing the following activities upon completion of the Environmental Impact Assessment process and acquiring the relevant permits and approvals:

- Open pit (surface) mining in ML 73B (also referred to as “Asis”) and associated activities;
- Processing of the ore at the existing process plant, currently being refurbished, and associated activities; and
- Dewatering the “Asis Far West” (AFW) Shaft and conducting further underground exploration activities in ML 16.

TABLE 3-2: NOTIFICATION, REGISTRATION, APPROVAL AND PERMITS

Issue	Act/Section	Type of requirement/Ministry
Mining licence	Section 91(f)	Approval of EIA and EMP/MME and MET
Written permission of the MC to erect any accessory works	Section 90 (2) (a)	Written permission from MC/MME
Permission to sell, discharge, etc. Minerals mined	Section 102 (1)	Permission from MC/MME
Permit to store and handle explosives on site	Explosives Act No. 26 of 1956	Permit / MME
Stipulates the use of public water for industrial purposes	Water Act, No 54 of 1956 Section 11 (1) – (7)	Permit
Sets out the requirements to obtain a permit to use public water for industrial purposes	Section 12 (1) – (9)	Permit
Water Abstraction permit – WA002	Section 13 (2)	Permit
Stipulates the purification of waste water and discharge	Section 21 (1) (2) (3) (4) (5) & 22	Permit for industrial waste water and effluent disposal/ water abstraction/ Directorate of Water Affairs in MAWF

Issue	Act/Section	Type of requirement/Ministry
Picking and transport of protected plants	Nature Conservation Ordinance, No. 4 of 1975 Section 73	Plant removal permit/Approval of landowner/Directorate of Parks and Wildlife in MET or the NBRI
Picking, removal of protected plants	Section 73	Permit/DPW in MET
Cultivation of protected plants in nursery (if required)	Section 75	Permit/MET
Scheduled processes in controlled area	Atmospheric Pollution Prevention Ordinance, No. 11 of 1976 Section 5(1)	Air pollution control certification/Ministry of Health and Social Service (MHSS)
Registration, selling, operating, installing of infrastructure related to Group I and III hazardous substances	Hazardous Substance Ordinance, No. 14 of 1974 Section 5 (1)(a)(b)(c)	Licences required for the sale, use and storage of "hazardous substances", which are specified in certain groups. MET and MHSS
Consumer installation certificate	Petroleum Product Regulations, 2000 Section 18 (5)	Certificate/license MME, Department of Energy
Actions to be taken after a spill has occurred (major petroleum spill means 200 l per spill)	Section 49(1)(4)	Notification/MME, Department of Energy
30-days notification prior to commencement of mining operation	Section 21	Notification/MoL
Transport/operating licence to transport goods on public roads	Roads Traffic and Transport Act, 1999 Section 60	Licence/Ministry of Works, Transport and Communication
Approval to work on Sundays, public holidays and continuous operation	Section 33	Approval/Ministry of Labour
Company must inform Chief Inspector (Ministry of Health and Social Services) before commencing building or construction work on the mine	Regulations concerning the Health and Safety of Employees at Work, 1997 (Government Notice 156 of 1997)	Ministry of Health and Social Services and Notification to MME

Issue	Act/Section	Type of requirement/Ministry
VAT registration	Value Added Tax Act, 2000	Certification
Tax registration	Income Tax Act, 1981	Certification
Social Security	Social Security Act, 1994 Section 20	Registration
Valid Affirmative Action compliance certificate	Affirmative Action Act, 1998, Section 42	Certification

TABLE 3-3: LIST OF PERMITS OR CERTIFICATES THAT MAY BE REQUIRED

Permit name	Regulator
Mining licence	MME
Environmental clearance for EIA and EMP	MET
Water abstraction and discharge (NamWater)	Ministry of Agriculture, Water and Forestry (MAWF)
Disposal of domestic and industrial water/solid waste	MET/MAWF
Disposal of domestic and industrial effluent	MET/MAWF
Licence for explosives magazine	MME/Police
Explosive burning permit	MME
Registration certificate for scheduled process	MME

4 PROJECT OVERVIEW

4.1 INTRODUCTION

The Kombat mine is located close to the town of Kombat on the southern margin of the Otavi Mountain Range in northern Namibia in the Otjozondjupa region, approximately 41 kilometres (km) east of Otavi on the B8 to Grootfontein.

Trigon proposes the following activities at the Kombat Mine:

- Open pit (surface) mining in ML 73B (also referred to as “Asis”) and associated activities;
- Processing of the ore at the existing process plant, currently being refurbished; and
- Dewatering the “Asis Far West” (AFW) Shaft and conducting further underground exploration activities in ML 16.

Refer to Figure 4-1 for the layout of the proposed infrastructure, in relation to the existing infrastructure and the town of Kombat.

Minor repairs and upgrades will be required to the available infrastructure on surface in order to fully re-establish the mining operation. This will mainly include the upgrading of the Kombat substation, re-establishment of existing arterial infrastructure, the processing plant and concentrator as well as workshops and offices

The proposed open pit mining activities relates to the Kombat Central and East pits with a combined Life of Mine (LoM) of ± 5 years based on current resources.

The existing process plant will employ conventional well-tested flotation processing methods and is capable of producing copper and lead concentrates. It consists of crushing, milling, flotation, concentrate thickening and filtering circuits. The plant, once refurbished, will be capable of treating the planned 30 ktpm from the proposed Kombat open pit areas.

The AFW shaft has to be dewatered before underground exploration activities can commence. Water will be pumped from AFW to an existing NamWater pipeline and fed into the NamWater system.

The refurbishment and upgrading of existing infrastructure has been conducted over recent years and is still on-going. Therefore construction activities associated with process plant, offices, workshops, access roads, etc. were not relevant to the assessment and this EMP.

The site layout of the proposed open pit mining and associated infrastructure (including the new WRD(s) and TSF) is illustrated in Figure 4-1 below. For the full detailed project description refer to Section 4 of the Scoping Report.



FIGURE 4-1: PROPOSED KOMBAT MINE LAYOUT AND INFRASTRUCTURE

5 ENVIRONMENTAL MANAGEMENT PLAN (ASPECTS AND IMPACTS)

Understanding the biophysical and human environment in which a mine operates is the first step to understanding environmental impacts. The next and possibly more important step is to identify the environmental aspects that give rise to the impacts. For example, the activity of blasting has more than one environmental aspect associated with it; namely, noise, vibration, dust generation and fallout debris (i.e. flyrock). All of these aspects have the potential to cause impacts on the environment in a different way.

Successful management will be gauged by how well Trigon avoids, minimises or mitigates all the impacts associated with each environmental aspect.

As part of the EIA process for the mining, processing and dewatering / exploration activities, environmental aspects and potential environmental impacts associated with the activities and facilities were identified. The full suite of Trigon's facilities and activities, associated with the various phases are described in the Scoping Report and summarised in Section 4 of this EMP. Table 5-1 provides a description of the environmental aspects that are associated with the proposed project and how they impact the biophysical and human environment.

The construction related activities relating to the proposed project are comprised of land clearing, topsoil removal, material loading and hauling, stockpiling, grading, bulldozing and compaction associated with the proposed new ancillary works and mineralised waste facilities. These activities will be conducted prior to the mining activities commencing.

TABLE 5-1: DESCRIPTION OF ENVIRONMENTAL ASPECTS AND POTENTIAL IMPACTS ASSOCIATED WITH THE PROPOSED KOMBAT PROJECT

ASPECT	POTENTIAL ENVIRONMENTAL IMPACT
Clearing of vegetation and soil stripping (earthmoving equipment)	Potential impact on biodiversity (physical impacts and general disturbance) <ul style="list-style-type: none"> • Loss of habitat • Loss of biodiversity • Loss of fertile soil • Spread of alien invasive plant species
	Potential impact on archaeological sites: <ul style="list-style-type: none"> • Destruction and loss of archaeological sites
Dangerous excavations/infrastructure and associated activities	Increased risk of Injury/fatality to third parties or animals: <ul style="list-style-type: none"> • Falling/trapped in the open pit, • Relating to activities associated with the TSF and WRDs.

ASPECT	POTENTIAL ENVIRONMENTAL IMPACT
Use of machinery, vehicles and equipment that can spill hydrocarbons	Impact on surface water and groundwater water quality.
The area of the open cast pits, causing reduced storm water flow	Hydrological regime alterations: <ul style="list-style-type: none"> • Loss of surface water flow volume as an important ecological driver due to a reduction to the downstream flow.
Drilling, blasting, loading and vehicle movement causing dust	Increase in dust levels/health impacts <ul style="list-style-type: none"> • Nuisance / Air pollution • Increased risk of respiratory diseases
Drilling, blasting, and other mining activities causing noise	Increase in disturbing noise levels (nuisance) <ul style="list-style-type: none"> • Noise pollution
Windblown dust from the WRDs, soil stockpiles and TSF	Increase in dust levels/health impacts <ul style="list-style-type: none"> • Nuisance / Air pollution • Increased risk of respiratory diseases
The operation of the WRDs and TSF may potentially impact on surface water flow and quality	Alteration of natural drainage patterns due to the proposed new WRDs and TSF. Contamination of surface water resources as a result of the WRD stockpiles and the TSF.
The operation of the TSF may potentially impact on groundwater (i.e. seepage)	Contamination of groundwater resources (via contaminated soils/surface water) as a result of the disposal of Tailings.
New WRDs, soil stockpiles and TSF	Increased visual impact
Blasting hazards	Increase in ground vibrations and fly rock have the potential to damage structures and property and impact on third parties and animals safety. <ul style="list-style-type: none"> • Risk of damage to surrounding structures • Fly rock can be released over a distance and can be harmful to people and animals/risk of accidents / injuries / fatalities.
Noise from vehicles, crushing and screening activities	Increase in disturbing noise levels (nuisance)
Dust and gaseous emissions from vehicles, crushing and screening activities	Increase in dust levels (nuisance & health impacts)
Oil and diesel spillages from haulage vehicles and other equipment	Impact on surface water and groundwater water quality.
Movement of big haul trucks on mine roads	Increased risk of Injury/fatality to third parties or animals
The operation of the processing facility may potentially impact on groundwater and surface water quality as a result of spills/leaks from the processing plant.	Contamination of groundwater and surface water resources
Noise from the processing activities	Increase in disturbing noise levels (nuisance impact to third parties)

ASPECT	POTENTIAL ENVIRONMENTAL IMPACT
Dust and gaseous emissions from the processing activities	Increase in dust levels (nuisance & health impacts to third parties)
Increase in vehicular movement	Increased traffic impacts on the roads and the intersection to the mine access road.
Waste disposal	Emissions to land, impact on biodiversity, environmental degradation and nuisance impacts
Sewerage management	
Economic impacts In-migration and community health /safety and security	Impacts on local economy, informal settlements, <ul style="list-style-type: none"> • Increased employment opportunities • Opportunity for skills transfers • Improvement in the business environment • increasing pressure on government services, • increased demand for basic infrastructure, • increased social ills, e.g family breakdowns, teenage pregnancies etc.
Abstraction of ground water (dewatering)	Reduction of groundwater levels due to dewatering of the shaft and pits impacting on other groundwater users.
Discharge of Dewatering from Mine pits causes pollution of Surface Water	Discharge of Dewatering from Mine pits causes pollution of Surface Water

6 OVERALL ENVIRONMENTAL OBJECTIVES FOR THE EMP

The following overall environmental objectives have been set for the proposed Kombat Project:

- To comply with national legislation and standards for the protection of the environment;
- To limit potential impacts on biodiversity through the minimisation of the footprint and the conservation of residual habitat within the mine area;
- To investigate and exploit measures to reduce resource and energy consumption;
- To keep surrounding communities informed of mining activities through the implementation of forums for communication and constructive dialogue;
- To limit contaminated effluent discharge into the environment through the containment, recycling or removal of contaminated water;
- To conserve soil resources by stripping, stockpiling and managing topsoil;
- To protect soils and groundwater resources through the implementation of measures for spill prevention and clean-up;
- To ensure the legal and appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, recycling, management, temporary storage and removal of waste;
- To minimise the potential for dust emissions through the implementation of dust control measures;
- To minimise the potential for noise and vibration disturbance in surrounding areas;
- To protect cultural heritage by implementing a chance find procedure;
- To undertake rehabilitation wherever possible during the life of the mine;
- To incorporate final closure objectives in mine planning;
- To develop, implement and manage monitoring systems to ensure good environmental performance in respect of the following: ground and surface water, air quality, noise and vibration, biodiversity and rehabilitation;
- To avoid potential impacts on the safety of third parties through appropriate site access control; awareness creation and ensuring third parties do not reside dangerously close to the mining and associated activities;
- To support and encourage environmental awareness and responsibility amongst all employees and service providers;
- To provide appropriate environmental education and training for all employees and service providers;
- To prevent pollution and clean up if incidents occur;
- To incorporate the relevant requirements stipulated in this EMP into the mine, plant process design and mine waste residue disposal;
- To ensure the all the contractors adhere to the construction related management commitments; and

- Ensure compliance to the EMP.

7 MANAGEMENT PLANS

The management plans (MPs), listed in the table below, are applicable to all the relevant activities and facilities of the Kombat operations. (The MPs follow in the subsequent sections).

TABLE 7-1: VARIOUS MPS AND NUMBERS

Number	Management plan (MP)
7.1	Stakeholder Consultation/Communication MP
7.2	Third Party Safety and Security MP
7.3	Surface water/stormwater MP
7.4	Groundwater MP
7.5	Air Quality MP
7.6	Noise & Vibrations MP
7.7	Biodiversity MP
7.8	Visual MP
7.9	Archaeology MP
7.10	Traffic MP
7.11	Socio-Economic MP
7.12	Resource MP
7.13	Soil MP
7.14	Waste Management MP

7.1
Stakeholder Consultation/Communication
MP

7.1 STAKEHOLDER CONSULTATION/COMMUNICATION MANAGEMENT PLAN

It is important that channels of communication are maintained over the life of the project for surrounding landowners (specifically the residents of the town of Kombat) and other relevant stakeholders. Table 7-2 shows the stakeholders' communication management plan.

7.1.1 COMPONENTS

This plan is made up of the following component:

- General Stakeholder communication.

7.1.2 MANAGEMENT AND MITIGATION

7.1.2.1 General Stakeholder communication

Objectives

To ensure that regular communication is provided on the relevant mining activities, together with feedback on the environmental management performance of the mine and that opportunity is provided for interested and affected parties to continue to raise comments and concerns (complaints) on the same.

Actions

TABLE 7-2: ACTIONS RELATING TO STAKEHOLDER COMMUNICATION

No	Issue	Management commitment
These commitments apply to <u>all phases</u> of the mining operation		
1	Understanding who the stakeholders are	Maintain and update the Kombat Project stakeholder register. Ensure that all relevant stakeholder groups are included.
2		A representative database would include government, employees, service providers, contractors, farmers, local communities (specifically the residents of the town of Kombat and Kombat Town Caretakers), NGOs, shareholders, customers, the investment sector, community-based organisations, suppliers and the media.
3		If relevant, include marginalised and vulnerable groups in the stakeholder communication process.
4		Record partnerships with local suppliers and investors as well as their roles, responsibilities, capacity and contribution to development.
5	Liaison with interested and affected parties	Devise and implement a stakeholder communication and engagement strategy. Quarterly meetings with the Kombat Town Caretakers and other relevant Town representatives and immediate neighbouring Farmers will be carried out.

No	Issue	Management commitment
6	Cooperative	Keep identified stakeholders informed about the mine's activities.
7	working relationship with stakeholders	Use appropriate communication channels to consult with, and disseminate information to, the identified stakeholder groups.
8	Managing perceptions, issues and/or complaints	<p>Develop and implement a concerns/complaints (grievance) process for stakeholders and publicise the channels through which issues can be submitted to Trigon.</p> <ul style="list-style-type: none"> • Document all complaints in an external communications register; • Respond immediately to acknowledge receipt of complaints and comments; • Investigate and report on findings of issue to the complainant; • Keep complete auditable records of complaints, responses and actions taken; and • Introduce an independent mediator if the grievance / complaint cannot be resolved between Trigon and the affected party.
9	Safety of 3 rd parties	Through appropriate communication and inductions, provide information to educate third parties about the dangers associated with hazardous excavations, infrastructure and movement of mining vehicles.

7.2
Safety & Security
MP

7.2 SAFETY AND SECURITY MANAGEMENT PLAN

It is essential that safety and security measures (relating to third parties) are defined and implemented to adequately protect the mine site from being accessed by unauthorised people. An emergency response plan for incidents is also essential.

Note that a separate Occupational Health and Safety (OHS) Plan shall be developed for the mining activities and that this does not form part of this EMP.

7.2.1 COMPONENTS

This plan is made up of the following components:

- General (third party) safety and security;
- Blasting – Third party safety hazards – i.e. Flyrock; and
- Occupational Health & Safety.

7.2.2 MANAGEMENT

7.2.2.1 General (third party) safety and security

Objectives

The objective of the management measures is to prevent physical harm to third parties and animals from potentially hazardous excavations, infrastructure and movement of mining vehicles.

Actions

TABLE 7-3: ACTIONS RELATING TO GENERAL (THIRD PARTY) SAFETY AND SECURITY

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommission</u> phases		
1	Access of unauthorised people	During the operations (including land clearing and limited construction activities) and decommissioning phases, barriers and/or warning signs will be used to keep people and animals away from the project, including the hazardous excavations and infrastructure and mining vehicles (i.e. haulage of mined material). In this regard, a high security fencing and security access control will be provided around the project areas (including, amongst others the plant, mine areas, soil stockpiles, mineral waste facilities, water storage areas, haul roads, etc.).
2		Security control will be in place at the access point to prevent uncontrolled vehicle and pedestrian access to existing and future mining, processing, stockpile and waste facility areas during the construction, operation and decommissioning phases.
3		Security and safety personnel will manage access to the site. Third parties and/or animals found in potentially risky situations will be managed by the relevant mine personnel.

4		Any persons entering the mine area (pit & plant) will be required to undergo a formal induction.
5		Security cameras at strategic location to be considered by Trigon.
6	Safety risks	A safety zone should be established between the mining activities and third parties. In this regard, the residents adjacent to the proposed Eastern pit, between the pit and the ML boundary, should be moved to a new location outside the ML area. Nobody should be allowed to reside in these properties (within the ML boundaries).
7		Information will be provided at stakeholder information meetings to educate third parties about the dangers associated with hazardous excavations & infrastructure and mining vehicles and machinery.
8		Operate an alcohol-free and drug-free site and include random testing of employees/contractors on entry to site, at the beginning of shifts and at any time on duty.
9		Develop a detailed fire management policy and ensure all employees/contractors are regularly drilled.
10		Ensure all security personnel are well vetted and well trained.
11	Emergency	Develop and implement an emergency response plan for third parties falling into, or off, hazardous excavations and causing injury. This will be kept by the EHS department.
These commitments apply to <u>design, construction and operation</u> phases		
12	Safety Risks	The permanent aboveground mineralised waste facilities and other stockpiles will be designed, constructed and operated in a manner that stability (i.e. safety) is a priority, that flood protection is provided, and that the risk of failure is reduced and maintained at acceptable levels.
These commitments apply to <u>operation</u> phase		
13	Chemicals / reagents	All legal health and safety requirements will be implemented when transporting hazardous chemicals to site.
14		Transport companies will comply with all legal requirements for the handling and transport of hazardous substances.
15		Major spillage incidents will be handled in accordance with the Kombat mine emergency response procedure. Any significant spills will be reported to DWA within 24 hrs and corrective action taken.
16		Induct all relevant employees and contractors in the mine's spillage management procedure.
These commitments apply to <u>closure</u> phase		

17	Safety Risks	Permanent above ground mineralised waste facilities and stockpiles will be closed in a manner that they present land forms that have similar safety attributes to the natural land forms in the area. In this regard, structures will be stable, protected from flood damage, and steep slopes will be contoured where possible.
18		At closure, the open pit perimeters will be bermed off with available waste rock and topsoil material. The viability of providing fencing as an additional measure will be investigated. The pit walls will be made safe from both a stability and access perspective. In the event that people or animals cross the berm and enter the pits the mitigation measures will ensure that there will be no risk of pit wall failure and that there will be safe exit options available. In addition, permanent warning signs will be in place at appropriate intervals, in appropriate languages with danger pictures to warn people of the long term safety risks of entering the open pits. This is depended on the decision to be taken in future whether the pits will be backfilled or not.

7.2.2.2 Blasting – third party safety hazards, i.e. flyrock

Objectives

The objective of the management and mitigation measures is to prevent physical harm to third parties and animals as a result of flyrock from blasting.

Actions

TABLE 7-4: ACTIONS RELATING TO GENERAL (THIRD PARTY) SAFETY AND SECURITY

No	Issue	Management commitment
These commitments apply to <u>operation and decommission</u> phases		
1	Safety risk due to fly rock	Refer to the management and mitigation measures presented in Table 7-3 – most of these also being relevant to this issue.
2		No houses should be located closer than 150 m from the pits. A safety zone should be established between the mining activities and third parties. In this regard, the residents adjacent to the proposed Eastern pit, between the pit and the ML boundary, should be moved to a new location outside the ML area. Nobody should be allowed to reside in these properties (within the ML boundaries).
3		Leave as much of the surface soft material in place as possible. This helps reduce the airblast and contains flyrock.
4		The best manner to control flyrock is through good blast design combined with accurate control of the charging operation.
5		No overcharged holes or underburdened holes along the free face are acceptable.

6	Shallow stab holes with short stemming lengths should not be used as there is a high risk of cratering.
7	Use crushed aggregate for stemming material. Drill cuttings and soil are not acceptable. Use a suitable tamping material in the underground exploration areas.
8	Ensure that the timing and sequencing of the blast allows for adequate relief of burden so that holes are not chocked. If possible, the blasts should be designed so that when initiated the blast sequence runs away from the infrastructure.
9	As a safety measure a minimum safe distance from the blast area must be cleared of people and animals. A minimum safety radius of 500 m is recommended. This can be varied depending on circumstances.
10	Production QC checks must be implemented as part of the Standard Operating Procedures. This is particularly important if Anfo or bulk explosives are being used. Problems such as running out of diesel (Anfo) or gassing solution (bulk) are not uncommon. During charging up of the holes the blended explosive product should be sampled on an ongoing basis to confirm that density reduction or fueling percentage (Anfo) is correct.
11	Avoid prolonged sleeping of blasts particularly in wet ground conditions. It is preferable to charge and fire the blast in the shortest possible time frame.

7.2.3 OCCUPATIONAL HEALTH & SAFETY

Occupational health and safety aspects of the proposed Kombat Project do not form part of this EMP. Trigon will however, adhere to all the relevant Namibian Legislation regarding health and safety, and implement a formal health and safety management system. The main components which should be included in such a management system are summarised below.

The objectives of the health and safety management system will be to ensure:

- A healthy and safe work environment;
- Safe systems of work;
- Safe plant and equipment; and
- The availability of such information, instruction, and training as required for worker health and safety.

Appropriate Health and safety induction will be a requirement for all employees, contractors and visitors. Specific training sessions will be developed and provided to employees regarding specific health and safety skill sets.

All hazardous chemicals used on site will have readily available material safety datasheets (MSDSs). Chemical hazards training will be an integral part of safety training and induction. Procedures will be developed for the use and handling of all dangerous chemicals. Correct personal protective equipment will be supplied for the relevant work.

7.3
Surface Water
MP

7.3 SURFACE WATER MANAGEMENT PLAN

Water is a scarce resource in Namibia, and Trigon will undertake its operations to maximise the recycling and reuse of water.

7.3.1 CONCEPTUAL STORMWATER MANAGEMENT PLAN

7.3.1.1 Design principles

Design Principles for stormwater management require the following:

- Capacity: dirty water systems are to be designed, constructed, maintained and operated so that they are not likely to spill into a clean water system or the environment more frequently than once in 50 years.
- Conveyance: all water systems are to be designed, constructed, maintained and operated so that they convey a 1:50 year flood event.
- Collect and Re-Use: ensure that dirty water is collected and re-used as far as practicable.
- Diversion: minimise flow of any surface water or floodwater into mine workings.

Figure 7-1 shows the conceptual storm water design for the mining area. Non-contact water should be diverted around pit 2 and allowed to flow over the haul roads. Contact water channel on the western and southern boundaries of the processing plant with a pollution control dam (PCD) downslope. The conceptual stormwater plan is discussed below.

Once the final infrastructure drawings and plans have been completed, the conceptual storm water plan can be updated to take into account the final layouts. It should be noted that the TSF option 4 is located at the start of a secondary catchment and therefore any runoff from this option should be prevented.

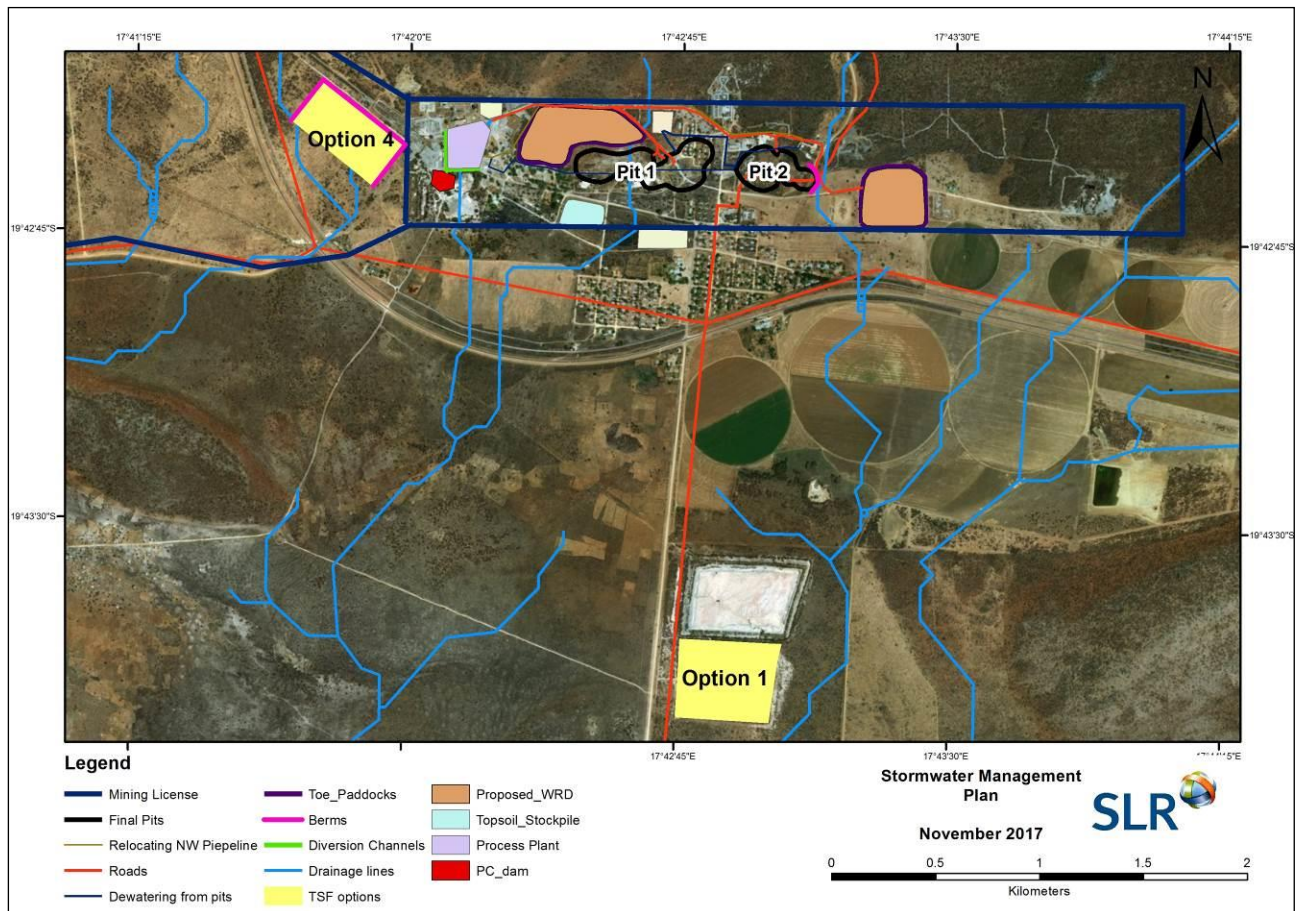


FIGURE 7-1: RECOMMENDED STORM WATER MANAGEMENT MEASURES

The plant infrastructure is divided into different sections and therefore the stormwater plan will include different sections and methods for the most effective collection of contact water, and diversion of non-contact water around infrastructure.

Non-Contact Storm Water

The objective of managing non-contact water is to provide flow pathways for storm water from upstream catchments to be diverted around surface infrastructure, thereby preventing this storm water from becoming contact water. Any water diverted should where possible be re-introduced into the local drainage downstream of the mining infrastructure to continue flowing in the local drainage network.

There are two main catchments upstream of the mining area, the western catchment running to the west of the TSF option 4 and the eastern catchment which intersects the mining area between pit 2 and the eastern WRD. The general drainage slope of the area is in a southerly direction with water accumulating in the higher mountainous area to the north of Kombat.

It is recommended that a berm is constructed around pit 2 to allow storm water to flow around the pit into the natural drainage (Figure 7-1). The haul roads in this area should be constructed to allow possible floodwater to flow over or underneath the roads. Main flow from the catchment will be sheet flow and should

not be allowed to accumulate against the haul road construction. This will prevent surface water from the eastern catchment flowing into the pit and will maintain natural flow pathways across the site, thereby minimizing any disturbance to the natural flow regime.

An alternative option is to design a diversion channel around pit 2 with the following characteristics, the channel should be designed to convey the peak flow expected during a 1:50 annual probability event which is approximately 24 m³/s. The channels should be contoured into the existing terrain around the pit, and should be compacted to reduce erosion and infiltration (see Figure 7-2 for design details). The channel passes under the haul road so that storm water is released towards the natural flow channels downstream of the road and does not cause erosion or ponding issues at the road.

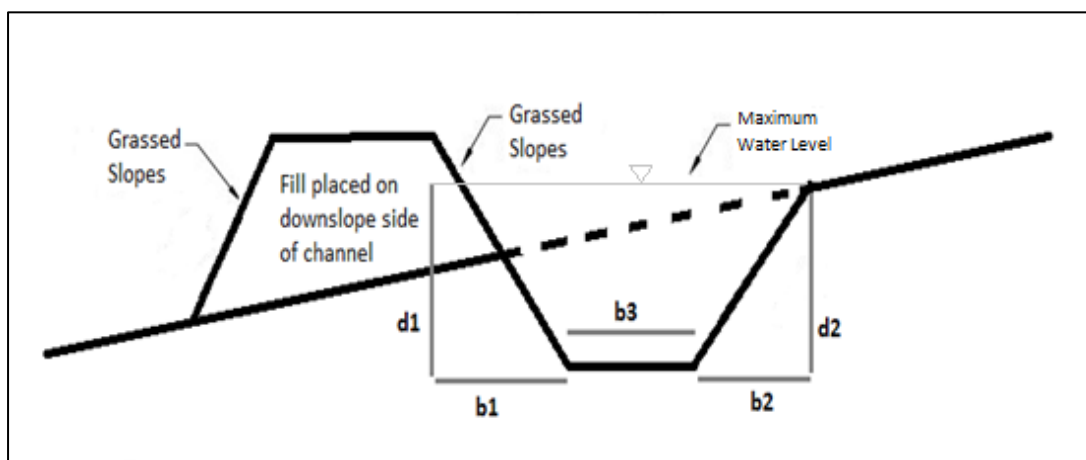


FIGURE 7-2: RECOMMENDED STORM WATER CHANNEL DESIGN

It is also recommended that a berm is constructed upstream of the TSF to divert any surface water flow around the TSF and back into the natural flow regime Figure 7-1.

Contact Storm Water

The objective of managing contact water is to collect all storm water which is potentially polluted by contact with mining activities, and to dispose of this water without it being released to the environment as runoff. Water quality testing of the captured contact water should be undertaken to indicate whether the contact storm water quality is sufficiently good for the water to be utilised for dust suppression purposes, or if it should only be stored and allowed to evaporate. The options for the site are discussed below.

The contact water generation area is divided into different sections, due to the small surface areas and locations of planned infrastructure different methods will be used to control contact water. Areas contributing to contact water include the TSF, Processing plant, open mine pits and the WRDs. Rainfall water on the TSF will be collected by berms on the surface of the TSF where it will either evaporate or be used in processing and therefore berms should be constructed high enough to contain the 1:50 year peak volumes, runoff from the TSF should be collected in toe paddocks and allowed to evaporate. Runoff water

from the WRD will be collected in toe paddocks around each WRD and allowed to evaporate while contact water from the processing area will be collected in a lined pollution control dam (PCD) to be used for dust suppression purposes depending on the quality.

The contact water generating area for the processing plant is approximately 38,278 m²; If a 1 day (24hrs) storm with 1:50 year recurrence takes place over this area, the volume of water can be calculated as follows:

- 1:50 year 24 hour rainfall intensity (HRU 2/78 IDF curves) = 110.3 mm
- 1:50 year 24 hour rainfall intensity (Modified Hershfield equation) = 145 mm

Average of the two methods = 127 mm over an area of 38,278 m² gives a volume of 4,861 m³, then taking an estimated runoff coefficient of 0.7 produces a runoff volume of approximately 3,402 m³. Hence the total holding capacity for the PCD should be the same.

The contact water channels can be the same design as the non-contact water channels, but the peak flow value for the reduced contact water catchment with a 1:50 year recurrence will be approximately 1.1 m³/s and should be compacted to reduce erosion and infiltration.

Channel design and dimensions will be done once final infrastructure plans are available

7.3.2 MANAGEMENT

7.3.2.1 Impacts on surface water quality - general

Objectives

The objective of the management measures is to prevent pollution of surface water run-off.

Actions

TABLE 7-5: ACTIONS RELATING TO THE MANAGEMENT OF SURFACE WATER – GENERAL

No	Issue	Management commitment
These commitments apply to <u>all phases</u>		
1	Clean & dirty water separation	Where possible, surface water management facilities will be designed, constructed and operated so that dirty water is kept separate from clean water run-off through a system of berms, channels, trenches, flood protection measures, erosion protection or dams.
2	Discharge of	Dewater from boreholes not the pit itself, where possible.
3	Dewatering from Mine pits	Monitor water quality to ensure that any discharge to the channel is of acceptable quality.

No	Issue	Management commitment
4	causes pollution of Surface Water	Water from mine pits to be pumped to settling dams and to be used for mine operation such as dust suppression on haul roads.
5	Rain water becomes	Construct berms around the TSF to prevent runoff from rainfall to overflow and pollute the surface water.
6	contaminated while flowing	Erosion protection e.g. rehabilitation of TSF with vegetation and WRD material after mine closure
7	over TSF and contaminates surface water	Non-contact water to be diverted around surface infrastructure and directed southwards
8		Contact water to be collected in toe paddocks and allowed to evaporate
9	Rainfall runoff mobilizes	Diverting clean offsite runoff water around potential contaminant sources with berms and drainage ditches
10	contamination from site (incl.	Collecting runoff from potential polluted sources to containment dams for reuse within mine.
11	dust) and pollutes surface water	Design of diversion berms or channels and containment dams to deal with 1:50 year storm
12		Rehabilitation of TSF with vegetation after mine closure
13		Dust suppression on haul roads and during operation of TSF
These commitments apply to <u>construction, operation and decommissioning phases</u>		
14	General surface water pollution/spills	All hazardous chemicals (new and used), dirty water, mineralised wastes, and non-mineralised wastes are handled in a manner that they do not contaminate surface water run-off or, where this is not possible, demonstrate (through regular monitoring) that the potential contamination is within acceptable limits from a human and environmental health perspective.
15		Prevent pollution through sound infrastructure design and through education and training of workers (permanent and temporary) in the storage, handling, dispensing and dispersal of hazardous materials (solid and liquid).
16		Develop an emergency response plan to ensure fast reaction to contain and remediate pollution incidents.
17		Ensure that contractors provide MSDS documents for all products brought to site, and that they have all the necessary hazardous protection equipment for people utilising the product, as well as the necessary equipment for the containment and clean-up of the environment in the advent of a spill.
18		Verify that the fuel transport company's spill containment (emergency clean up) plan and spill clean-up agreement are in place.

No	Issue	Management commitment
		Ensure that fuel transporting companies adhere to the Petroleum Products and Energy Act (13 of 1990) and Regulations
19		Establish and maintain concrete or lined impermeable bunded areas around diesel generators, hazardous material stores, wash bays, workshop floors etc. Ensure drainage to oil and silt sumps that are regularly cleaned.
20		Implement and maintain hazardous materials and hydrocarbon spill management procedures.
21		Ad hoc spills will be cleaned up/remediated immediately in line with spillage management procedure.
22		Place spill kits in all areas where hazardous substances are dispensed and stored and train staff to use it.
23		Develop audit criteria for post rehabilitation in situ spills to ascertain when/whether the remediation has been successful.
24	Mine infrastructure	Ensure that where mine infrastructure becomes damaged, or causes surface water contamination, that it is adequately repaired and maintained.
25	Emergency	Major spillage incidents that contaminate flood waters will be handled in accordance with the Trigon emergency response procedure and reported to the authorities as stipulated in the Namibian legislation.
26	Training and awareness	Induct all employees and contractors in Trigon's spillage management procedure.
27	Safe disposal and rehabilitation of hydrocarbon contaminated soils and water	Develop and implement a hydrocarbon remediation procedure that explains how to deal with the treatment of contaminated environments (soil and water). Train selected staff in the remediation of soils or water contaminated by hydrocarbon spills.
28	Monitoring of hydrocarbon	Ensure that checking for hydrocarbon spills is included in the daily inspections.
29	and other hazardous spills	Report spillages as per the incident management procedure and Namibian legislation.

Please refer to Section 7.14 for management measures relating to waste management.

Spill remediation options include in situ treatment or disposal of hydrocarbon contaminated soils as hazardous waste. The former is generally considered to be the preferred option because with successful in situ remediation the soil resource is retained. The *in situ* options include bioremediation at the point of

pollution, or removal of soils for washing and/or bio remediation at a designated area after which the soils are replaced. Soils contaminated with more hazardous materials should be disposed of at a registered hazardous landfill site.

7.3.2.2 Industrial effluent

Objectives

The objective of the management measures is to prevent pollution of surface water, etc. due to industrial effluent.

Actions

TABLE 7-6: ACTIONS RELATING TO INDUSTRIAL EFFLUENT

No	Issue	Management commitment
These commitments apply to <u>operation phase only</u>		
1	Discharge	Ensure that no discharge takes place (closed system).
2	Spillage of industrial effluent	Prevent spillages of industrial effluent. Where spillage does occur, ensure it is properly contained.
3		Checking for industrial effluent spills included in the daily inspection checklist.
4		Report spillages as per the incident management procedure and clean up spills as soon as possible.
5	Pollution of soil and / or water when spillage or discharge occurs.	In the event of industrial effluent discharge into the environment, follow the relevant emergency response procedures and then investigate the cause of the incident.
6		In the event of soil or water pollution, spills will be cleaned up/remediated as soon as possible in line with spillage management procedure.
These commitments apply to <u>construction, operation and decommissioning</u>		
7	Prevent industrial effluent from polluting the environment (PCD)	Ensure that the various effluent streams are managed to prevent overflow of the PCD
8		Ensure that a freeboard is maintained to accommodate run-off during a 1:50 year storm event.
9		Monitor the effectiveness of the mitigation measures (e.g. liner) for damage to ensure that seepage does not occur.
10		Design storage/containment facilities with sufficient capacity to cater for the various sources of water, including rainfall.
11		Ensure that all the industrial effluent is discharged into the PCD.
12		Install oil separators at all wash bays to separate hydrocarbons from the water.

No	Issue	Management commitment
13	Discharge of industrial effluent to the PCD	Skim oil separator regularly and dispose of hydrocarbons as per the waste management procedure.
14	Spillage of industrial effluent	Maintain pipes, drains, pumps, valves, etc. to minimise the likelihood of leaks.
These commitments apply to <u>construction and operation</u> only		
15	Prevent industrial effluent from polluting the environment	Recycle all process water back into the plant as per the design specifications.
16	Storage and disposal of liquid waste (hydrocarbons)	All liquid hydrocarbon waste will be collected, safely stored in sealed drums on impermeable surfaces within bunded areas, preferably under rain proof cover. These areas will be designed to contain 110% of the volume of one or the largest (in a multi drum setup) drum and will be equipped with traps and oil separators to contain spilled hydrocarbons. The used hydrocarbon liquid waste will be provided to third parties for environmentally acceptable recycling thereof. Related records will be kept.

7.3.2.3 Domestic effluent

Objectives

The objective of the management measures is to prevent pollution of surface water, etc. due to domestic effluent.

Actions

TABLE 7-7: ACTIONS RELATING TO DOMESTIC EFFLUENT

No	Issue	Management commitment
These commitments apply to <u>construction, operations and decommissioning</u>		
1	Discharge of raw sewage and grey water	Conduct regular monitoring to ensure that effluent is not being discharged into the environment.
2	Spillage of domestic and treated effluent	Report spillages as per the incident management procedure and clean up spills within as soon as possible in line with the spillage management procedure.
3	Pollution of soil and / or ground	In the event of domestic effluent discharge into the environment, stop the incident as soon as possible and find the root cause.

No	Issue	Management commitment
4	water when spillage occurs.	In the event of soil or water pollution, decontaminate the polluted area(s) using an appropriate methodology. Once clean, rehabilitate the area.
5	Awareness and Training	Train operators to understand the legal requirements and how to achieve compliance.
6		Induct Trigon employees and contractors in the use of the spill management procedure.
These commitments apply to the <u>construction</u> phase		
7	Discharge of raw sewage and grey water into appropriate sewage treatment facilities	Ensure that portable facilities / septic tanks constructed during the construction and decommissioning phases are managed according to the design specifications.
8	Spillage of domestic and treated effluent	Maintain portable facilities, pipes, drains, pumps, valves, etc. to minimise the likelihood of leaks.
9		Ensure that checking for domestic and treated effluent spills is included in the daily inspection checklist.
10	Ablution facilities	Ensure that portable toilets are working properly and are cleaned at least weekly, so they do not pollute the surrounding environment or create hygiene problems.
11		Ensure that sewage from the portable toilets is disposed of at the nearest approved sewage works.
12	Transport of sewage to municipal facility	Ensure that the contractor responsible for removal of sludge to a municipal facility has an emergency response plan in place in case of accidental spills. Also, the contractor must provide proof of safe disposal of sewage at the Municipal sewage works.
These commitments apply to <u>operation and decommissioning</u> only		
13	Sewage treatment	Trigon to work in close collaboration Havana Investments (Pty) Ltd to improve the current wastewater/sewerage treatment or to design and implement a new treatment system altogether, prior to implementing the proposed project.
14		Ensure the treatment facility is regularly serviced and maintained to keep it in proper working condition.

No	Issue	Management commitment
15		If the treated water is acceptable for discharge it will be reused.
16		Sewerage sludge shall be removed by the sewage services contractor for appropriate disposal or will be land farmed to produce compost for mulching and rehabilitation purposes.
17	Legal compliance	Ensure the permit requirements by DWAF are renewed due to the changed to the facility, where required.
These commitments apply to <u>operation</u> only		
18	Treatment of sewage and grey water	Develop an operations manual for the facility and ensure the sewage treatment facility operates according to the operations manual to ensure optimum performance.

7.3.2.4 Spills (Hazardous and hydrocarbons)

Objectives

The objective of the management measures is to prevent pollution of surface water, etc. due to spillages.

Actions

TABLE 7-8: ACTIONS RELATING TO SPILLAGES

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u>		
1	Emergency situations – very large spills	Maintain and implement the emergency response procedure to address large scale hydrocarbon, hazardous materials or reagent spills on and off site.
2	Hydrocarbon spills	Ensure Trigon or its contractor have the relevant licences and can provide reports that all surface storage tanks are in good condition (as per legal requirements).
3		Ensure that hydrocarbon (used and new fuel and oil) tanks and drums are stored inside bunded areas on impermeable floors with traps and separators for containing spillages. These areas are designed to contain 110% of the volume of one or the largest (in a multi tank setup) tank and that pumps and pipes are maintained in good working order.
4		All wash bays will be equipped with oil traps and separators. All collected oil will be stored as above.
5		Ensure that all fuel and oil storage facilities and transport tankers have spill kits.
6		Ensure that the fuel transport company has a system in place to deal with hydrocarbon spills and subsequent clean-up thereof.
7		Contain the spill and commence with remediation as soon as possible. Log an incident and report to the authorities if volumes released are above specific limits.
8		If contamination of water ponds occurs, separate the hydrocarbons from water and treat the water before recycling and re-use.
9		Domestic and Industrial effluent
10	Ensure that capacities of the various facilities and pipes are not exceeded.	
11	All vehicles and equipment will be serviced in workshops and wash bays with contained impermeable floors, dirty water collection facilities and oil traps.	
12	Contain any spills and clean up as soon as possible and report as per the incident management procedure.	
13	If in situ treatment is not possible or acceptable then the polluted soil must be excavated, and treated as per the Kombat waste management procedure.	

No	Issue	Management commitment
14	Legal Compliance	Comply with all legal requirements regarding spills and containment structures.
15	– all spills	Hydrocarbon spills of 200l or more must be reported to MME in terms of Section 49 of the Petroleum Products Regulations 2000.
16	Monitoring of spills – all spills	Ensure that the monitoring of all tanks, pipelines and bunds are included in the daily inspection programme to develop an early detection system for leaks.
17		Update, maintain and implement a maintenance plan for tanks, tankers, pipelines and bunds.
18		Identify post rehabilitation audit criteria for verifying that remediation has been successful.
19		Conduct periodic audits of facilities to ensure compliance with legal and company standards.
20	Awareness and training – all spills	Induct all Trigon employees and contractors in the Environmental Policy, spillage management and incident management procedures.
21		Train selected employees in the containment, and handling of spills and in the de-contamination and rehabilitation of affected environments.
22	Emergency situations – all large or remote spills	Major spillage incidents must be handled in accordance with the emergency response procedure.
23		Identify and contract a service provider/specialist to assist with the handling and clean-up of emergency spills off site. I&APs will be provided with the details of the EHS team so that they can notify them of any spills that have occurred in the area. The EHS team will be responsible for contacting the above-mentioned service provider.
24		Periodically test the emergency response procedures.
These commitments apply to <u>operation</u> only		
25	Reagent spills	Ensure that the reagent supply and/or transportation companies are in possession of the relevant transport licences, can prove transport and storage tanks are in good condition and have an emergency response system in place to deal with spills the clean-up thereof.
26		Ensure that reagent tanks are housed inside impermeable lined, or concrete, bunds and that dispensing takes place on an impermeable surface. No reagents may be discharged to the environment. Spills must be cleaned up and waste disposed of according to MSDS recommendations.
27		Ensure that bunds are designed to contain 110% of the volume of the SX area and that pumps and pipes are maintained in good working order. (Risk assessment mitigation measures must be implemented).

No	Issue	Management commitment
28	Process solution spills	Ensure that bunds have been designed to capture any release of solution to the extent of 110% of the largest tank constructed inside the bunded area.
29		As far as possible keep bunds clean and empty.
30		Ensure that pumps and pipelines are in place to pump solutions from the bunds back into the process.
31		Maintain and implement an emergency procedure for the containment and clean-up of process solutions if bunds are breached, and the consequent treatment of contaminated areas.
These commitments apply to <u>operation and decommissioning</u> only		
32	Reagent spills	Contain the spill using appropriate spill kits, and clean up as soon as possible as per the MSDS specification, report and investigate as per the incident management procedure.
33		All solid reagents to be picked up and placed in the relevant reagent tank for use in the plant. If the reagent is polluted it must be disposed of at a hazardous landfill.
34		If contamination of water occurs, contain the water and treat it, or direct it into the process dam for use into the process plant.
35		Identify and utilise a service provider to assist with the clean-up of very large reagent spills (emergency situations) as required.
36		All major spills (>200l) will be reported to the MAWF.
37		Continuous monitoring of the spill site will take place until such time as it is proven that contamination no longer occurs.

7.4
Groundwater
MP

7.4 GROUNDWATER MANAGEMENT PLAN

Potential groundwater quality and quantity impacts are a potential issue during the construction and operation of the various mining activities and infrastructure, unless measures are undertaken to prevent and mitigate such impacts. The purpose of this groundwater management and mitigation plan is to provide for methods to be followed to achieve such mitigation.

The commitments derived from the EIA Report with regards to groundwater management forms the basis of this MP.

7.4.1 COMPONENTS

This plan is made up of the following components:

- Water abstraction (dewatering); and
- Contamination of groundwater.

7.4.2 MANAGEMENT

7.4.2.1 Water Abstraction (dewatering)

Objectives

The objective of the management measures is to manage the proposed water demands and supply and to monitor and mitigate the loss of groundwater in supply boreholes due to these activities.

Actions

TABLE 7-9: ACTIONS RELATING TO WATER ABSTRACTION (DEWATERING)

No	Issue	Management commitment
These commitments apply to <u>design and operations phase</u>		
1	Pit and shaft dewatering	A dedicated groundwater monitoring network should be implemented by the mine. That includes the drilling of monitoring boreholes and the regular measurement of water levels and the reporting to the authorities. The independent monitoring by the DWAF and NamWater should, however, continue.
2		Groundwater levels from selected existing boreholes on farms surrounding the Kombat Mine also have to be monitored (water levels, water quality).
3		The continuous monitoring will allow the assessment of possible negative impacts of abstraction on farmers and other water users in the surroundings of the Kombat Mine. If a user is negatively impacted, e.g. the water level dropped due to the additional abstraction for mining purposes and the borehole does not yield the usual volumes then the Kombat Mine will have to compensate the user. That could be the deepening of a boreholes, the drilling of a new borehole or the supply of water by other means. The proposed mitigation measures reduce the probability that farmers and other

No	Issue	Management commitment
		users in the surroundings of the Kombat Mine will be negatively affected by the proposed six-year long groundwater abstraction of the mine.
4	Groundwater inflow	Groundwater inflow to the AFW shaft should be chemically sealed where possible to reduce impact on surrounding groundwater levels and to avoid the production of excess water.
5	Blasting	Good housekeeping is essential to help keep water pollution in check. The practice of setting bulk pump trucks up by discharging a quantity of explosive into the pit to allow systems to be checked should be prevented. Similarly, cleaning of the feeder pipes, pumps and loading hose by blowing them clean and discharging this material into the open pit should be prevented.
6		Spillage on the surface of the bench should be kept to a minimum. These control measures are essential to prevent unnecessary pollution.
7		The bulk explosive storage areas should be bunded to contain spillage that may occur during transfer of raw materials to or from the storage silos. A method of handling and disposing of this oil based waste must be approved and implemented.
8	Legal aspects	An abstraction permit has to be obtained from the Department of Water Affairs and Forestry for the dewatering of the Asis Far West Shaft and also for the pumping from Shaft 1 and Shaft 3 for the dewatering of the open mine pits and water supply of the mining operations. This has to be coordinated with NamWater who are pumping from dedicated production boreholes intersecting the mine workings near Shaft 1 and plan to abstract >700m ³ /h for supplementary water supply to the Central Areas of Namibia. It was agreed between the two parties to apply for a joint abstraction permit with the DWAF. A total of 1,000 m ³ /h is estimated to be abstracted from the mining area, of which only approximately 150 m ³ /h will be used for mining purposes.
9		This EIA and groundwater model will form the basis for the abstraction permit application and the permit will specify what frequency and type of groundwater monitoring is required.

7.4.2.2 Impacts on Groundwater Quality

Objectives

The objective of the mitigation measures is to prevent impacts on third party ground water users.

Actions

TABLE 7-10: ACTIONS RELATING TO PROTECTION OF GROUNDWATER CONTAMINATION

No	Issue	Management commitment
These commitments apply to <u>design and construction phases</u>		
1	Potential seepage from the TSF	Implement TSF option 4 (i.e. new lined TSF).
2		Implement a TSF design that conserves the groundwater resources.
3		Install an impermeable HDPE liner and seepage control and recycling system The transport model shows that if a liner is in place, the seepage plume would be restricted to the TSF perimeter
4		Comply with Namibian legal requirements (benchmarking against South African standards and best practice international standards)
5	Seepage of process fluids, sewage systems, oil or fuel from the Processing Plant and construction vehicles	Construct the TSF on the earmarked Mulden Group phyllites west of the plant area. The phyllites are mostly impermeable and prevent/retard possible seepage plume reaching the regional dolomite aquifer.
These commitments apply to <u>operations phase only</u>		
6	Potential seepage from the TSF	Engineered containment of process areas, sewage treatment facility, vehicle maintenance areas, and fuel and oil storage areas.
7	Seepage of process fluids, sewage systems, oil or fuel from the Processing Plant and construction vehicles	Drill monitoring boreholes on TSF perimeter for detection of possible contaminated seepage.
8		Site speed limit and traffic signage to reduce risk of vehicle accidents
9		All vehicles to carry fuel and oil spill kits, with staff trained in the use of spill kits.
10		Regular and effective training of employees who handle these potential contaminants.
		Refer to Waste Management Plan

No	Issue	Management commitment
11	Non-hazardous waste landfill	A groundwater monitoring borehole should be drilled between the landfill and the planned mine pit. The monitoring borehole has two functions: it will provide information on the dewatering status of the open pit and detect potential pollution from the landfill site.
12	WRDs	It is recommended to carry out an Acid Base Accounting study of WRD material to confirm the neutralizing potential of the carbonaceous country rock.

7.5
Air Quality
MP

7.5 AIR QUALITY MANAGEMENT PLAN

There are a number of emission sources of the Proposed Kombat Project that have the potential to pollute the air. The activities associated with mining of the two pits have the potential to cause additional dust related impacts, particularly the access / haul road associated with the proposed mine where receptors reside in close proximity to these activities.

In the decommissioning phase these activities are temporary in nature and the air quality impacts are expected to be low. The operational phase will present more long term activities and the closure phase will present final land forms that may have the potential to pollute the air through long term wind erosion. The assessment below therefore focuses on the operational phase (worst case) of the project.

The commitments derived from the Scoping Report with regards to Air Quality form the basis of this MP.

7.5.1 COMPONENTS

This plan is made up of the following component:

- Dust fallout, PM₁₀ and other gaseous emissions.

7.5.2 MANAGEMENT

Objectives

The objective of the management measures is to prevent unacceptable air quality related pollution impacts.

Actions

TABLE 7-11: ACTIONS RELATING TO FALL-OUT DUST, PM₁₀ AND GASEOUS EMISSIONS

No	Issue	Management commitment
These commitments apply to the <u>construction, operations and decommissioning</u> phases		
1	Dust, PM ₁₀ and other gaseous emissions	It is proposed that a separation distance of 250 m is maintained at all times between proposed activities at Kombat Central and Kombat East opencast mines and residential land users. As a minimum, all receptors falling in the 250m separation distance within the Mine Licence Area must be relocated prior to commencement of the mining activities. The receptors falling within the 250m separation distance outside of the Mine Licence Area must be monitored throughout the Life of Mine (LOM) and in the case of unacceptable exceedances (more than 4-days per year of the recommended daily Air Quality Limit of 75 µg/m ³), these must also be relocated. (Refer to section 9.1.2 for more details on air quality monitoring).

No	Issue	Management commitment
		Therefore, people should not be allowed to stay within the ML area. Also, the old schools and hostels (north of the proposed pits) should not be used during the mining activities.
2		Trigon to commit to adequate air quality management planning throughout the life of the Project.
3		In controlling vehicle entrained PM, it is recommended that water be applied (> 2 litres/m ² /hr) on unpaved haul roads to ensure a control efficiency of at least 75% – alternatively chemical suppressant can result in more than 90% control efficiency.
4		Hoods with fabric filters be fitted to primary and secondary crushers to achieve a control efficiency of up to 85%.
5		In minimizing windblown dust from stockpile areas, temporary wind breaks to be installed to reduce wind speeds over the area and establish vegetation cover on the dormant areas.
6		Implement a dust monitoring programme (refer to section 9.1.2).
7		If fumes occur after a blast then the immediate vicinity of the blast area must be kept clear until these have dissipated. The wind direction and local weather conditions must also be kept in mind to ensure that the fumes do not impact further afield.
8		Implement management and mitigation measures regarding blasting impacts to further avoid/minimize air quality impacts as a result of blasting.

7.6
Noise and Vibrations
MP

7.6 NOISE AND VIBRATIONS MANAGEMENT PLAN

There are a range of activities that have the potential to generate noise and cause noise pollution. Furthermore, blasting can cause vibration related impacts to nearby receptors.

The commitments derived from the Scoping Report with regards to noise and vibrations form the basis of this MP.

7.6.1 COMPONENTS

This plan is made up of the following components:

- Noise pollution
- Blasting vibrations

7.6.2 MANAGEMENT

7.6.2.1 Noise

Objectives

The objective of the management measures is to limit excessive noise.

Actions

TABLE 7-12: ACTIONS RELATING TO NOISE

No	Issue	Management Commitment
These commitments apply to <u>construction, operation and decommissioning</u>		
1	Impact of noise on the environment/sensitive receptors	It would be prudent to relocate all residential, educational, and or institutional structures within the ML area. However, given the nature of desktop impact assessments and uncertainties associated with source term estimates and theoretical simulations, the following is proposed: <ol style="list-style-type: none"> 1) It is understood that mining will commence within the western part of the Kombat Central pit. Both source and ambient noise monitoring should be conducted as mining commences and progresses eastward at regular intervals to verify simulation results and projected impact areas. 2) The results of monitoring should be used to update estimates of the 55 dBA impact zone. 3) All residential, educational, and or institutional structures within the confirmed impact zone should then be relocated prior to mining activities progressing so far as to impact NRs.
2		It is further recommended that general good practice measures for managing noise as set out below, be implemented (Refer to the Noise Specialist Report for more detail) as far as practically possible:

No	Issue	Management Commitment
3	Controlling noise at the source	<p><u>General Good Practice Measures</u></p> <p>The following good engineering practice should be applied:</p> <ul style="list-style-type: none"> ○ All diesel-powered equipment and plant vehicles should be kept at a high level of maintenance. ○ In managing noise specifically related to vehicle traffic, efforts should be directed at: <ul style="list-style-type: none"> ○ Minimising individual vehicle engine, transmission, and body noise/vibration. This is achieved through the implementation of an equipment maintenance program. ○ Maintain haul road surfaces regularly to avoid corrugations, potholes etc. ○ Keep all roads well maintained and avoid steep inclines. ○ Avoid unnecessary idling times. ○ Minimising the need for trucks/equipment to reverse. This will reduce the frequency at which disturbing but necessary reverse warnings will occur. Alternatives to the traditional reverse 'beeper' alarm such as a 'self-adjusting' or 'smart' alarm could be considered. ○ Limiting traffic to hours between 06:00 and 18:00 specifically during the beginning stages of the mining activities until further noise monitoring has been conducted to confirm modelling results and further management and mitigation measures stipulated by a noise specialist, as and where required. ○ Where possible, other non-routine noisy activities such as construction, decommissioning, start-up and maintenance, should be limited to day-time hours. ○ A noise complaints register must be kept.
4		<p><u>Specifications and Equipment Design</u></p> <p>Equipment and methods to be employed should be reviewed to ensure the quietest available technology is used. Equipment with lower sound power levels must be selected in such instances and vendors/contractors should be required to guarantee optimised equipment design noise levels.</p>
5		<p><u>Enclosures</u></p> <p>As far as is practically possible, source of significant noise should be enclosed.</p>
6		<p><u>Use and siting of equipment</u></p> <p>Plant and equipment should be sited as far away from NRs as possible. Also:</p> <ul style="list-style-type: none"> • Machines (e.g. cranes and drill rigs) used intermittently should be shut down between work periods or throttled down to a minimum and not left running unnecessarily. This will reduce noise and conserve energy. • Plants or equipment from which noise generated is known to be particularly directional, should be orientated so that the noise is directed away from NR's. • Acoustic covers of engines and compressors should be kept closed when in use or idling. • Construction materials such as beams and bricks should be lowered and not dropped.
7	Monitoring	<p>An environmental noise monitoring campaign should be conducted annually (refer to section 9.1.3). Also, in the event that noise related complaints are received short term (30-min to 24-hours in duration) ambient noise measurements should be conducted</p>

No	Issue	Management Commitment
		as part of investigating the complaints. The results of the measurements should be used to inform any follow up interventions.

7.6.2.2 Blast Impacts

Objectives

The objective of the management measures is to limit air blast and ground vibrations.

Actions

TABLE 7-13: ACTIONS RELATING TO AIR BLAST IMPACTS

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u>		
1	Control of ground vibration	A change to the drill and blast method may be required to limit the PPV levels to acceptable levels. This could include reducing the hole diameter, using cartridge explosives with deck charges (multiple if required) coupled with sequenced firing of the individual holes and decks to minimise vibration levels. An application like this will require the use of electronic detonators. The emphasis must be with safety in mind given the proximity of the houses to the open pits.
2		Blasting in the open pits should start at the western end of the central pit and move progressively to the east. When blasting starts the impact at distances of 50m, 100m, 150m and 200m from the blast should be determined. This will allow the disturbance levels to be quantified and linked to specific blast designs. This information can then be used to assist with future blast designs, which will be essential as the blasting moves to the east and closer to the houses in Kombat.
3		The modelling indicates that at a distance of 150m from the blast that a ground vibration level of 6mm/sec is expected for single hole firing. This increases to 14mm/sec at a distance of 90m. Vibrations at 6mm/sec are extremely unpleasant for people who are inside buildings at the time. Levels of 14mm/sec will be intolerable. These impacts suggest that the houses located at distances of 150 m and closer should be abandoned. This decision should be considered not only because of the ground vibration disturbance levels but also because of the risk of flyrock and other impacts.
4		Disturbance monitoring is essential and should be carried out from the first blast using industry specific seismographs, which are equipped with a triaxial geophone and a separate microphone. This allows simultaneous measurement of ground vibrations and air blast.

No	Issue	Management commitment
5		Seismographs should be positioned at sensitive or potentially sensitive locations. Seismographs should be set up on a permanent basis at pre-determined locations around the pits. These locations should be finalised and the stations positioned before the first blast is set off. Typically the buildings closest to the mining operations would be used to position the stations.
6		The ground vibration and airblast levels measured must be compared to the blast design and modelling results as well as to recognised and accepted industry standards to ensure compliance (see Appendix 2 for a summary of these). Use the seismograph information to check that the disturbance levels are compliant. If not the blast designs should be reviewed and changes made to the design to bring the levels down.
7		Keep accurate and comprehensive blast records. All of the blast parameters as well as the timing and sequencing used to delay the blast should be recorded, as the individual seismograph measurements made need to be linked to the blasts. The blast information can be referenced and used to assist with future blast designs.
8		Although the USBM limit for ground vibrations is accepted in many countries by the authorities, consideration should be given to applying the DIN standard where structures in poor condition or of suspect build quality are encountered. If DIN is used then the PPV levels will need to be limited to less than 5 mm/sec.
9		The holes must not be overcharged. This must be rigorously policed to ensure that the explosive supplier does not slip up and then cover up.
10		After charging up is complete and prior to stemming the holes closed, they should be taped to determine the explosive column rise to confirm that the required stemming length is obtained. Any errors must be corrected before the hole is stemmed closed.
11		The correct stemming material should be used to stem the holes closed. Crushed aggregate is recommended for stemming material in the open pit. Material that has an average diameter of 0.10 times the hole diameter should be used. Suitable tamping should be used in the underground blasts.
12		Small charge masses per delay is required to limit disturbances when the mining takes place close to the houses and other buildings. The number of holes that can be fired together will vary depending on the location of the blast/s relative to this infrastructure.
13		Small charge masses per delay will be needed in all sections of the pits. Individual hole firing will be required from the start of the operation.

No	Issue	Management commitment
14		If the disturbance levels are still excessive then the holes will need to be deck charged to reduce the charge mass per delay even further. Smaller diameter holes may also need to be drilled.
15		Electronic detonators should be used to initiate the blasts. They provide the accuracy required to ensure individual hole firing and the accurate firing of deck charges.
16		If sensitive structures are present in an area then specific design work may need to be carried out to ensure that the disturbances caused by blasting are kept as low as possible.
17	Control of airblast	Make use of the seismograph information recorded at the permanent stations (see 10.1 point 2 in Blasting Review report) to ensure that the levels are acceptable. If not, the blast design should be reviewed and amended as required.
18		Local conditions such as wind strength and direction, presence of low clouds or temperature inversion conditions need to be considered when making a decision as to whether a blast should be set off or not. If the adverse weather conditions exist, postpone the blast.
19		Leave as much of the surface soft material in place as possible. This helps reduce the airblast and contains flyrock.
20		The holes must not be overcharged. This must be rigorously policed to ensure that the explosive supplier does not overcharge the holes.
21		After charging up is complete and prior to stemming the holes closed, they should be taped to determine the explosive column rise to ensure that the required stemming length is obtained. Any errors must be corrected before the hole is stemmed closed. A minimum stemming length of 20 hole diameters is required.
22		The correct stemming material should be used to stem the holes closed. Crushed aggregate is recommended for stemming material. Material that has an average diameter of 0.10 times the hole diameter should be used. Suitable tamping should be used in the underground blasts.
23		Short stab holes can (and often do) crater, resulting in high airblast levels. Stab holes should be avoided if possible. If required, they should be lightly charged. Alternatively, a small satellite charge can be positioned higher up in the primary blasthole to help break the rock in the collar region.
24		Accurate control is required when marking out hole positions to ensure that holes are not positioned too close to poor areas of the face that could result in the hole/s being underburdened as this could result in face blowouts.
25		Detonating cord should be outlawed for use on surface or down the hole. Only electronic detonators should be used to initiate the blasts.

No	Issue	Management commitment
26		No unconfined blasting should take place. Any pre-split holes should be plugged at a depth equal to eleven hole diameters. The section of hole above the plug should then be stemmed closed with aggregate.
27	General	Prior to the start of blasting the proposed blast design should be modelled to determine the firing sequence, number of holes firing together and the combined charge mass per delay. Based on these figures the peak particle velocities should be calculated at the points of concern. These predictions should be compared to recognised standards – such as the United States Bureau of Mines Standard (USBM RI 8507) and DIN standard – to ensure compliance. When acceptable results are obtained, the design should be fixed for use in the field. The approved blast design should be marked and drilled off in the field.
28		After the blast is drilled off and before charging up commences, the holes drilled should be inspected and all ‘problem’ holes identified for corrective action. Examples of ‘problem’ holes could include holes that are under burdened, holes that are short drilled, holes surrounded by badly cracked ground and off pattern holes that could potentially lead to problems.
29		An instruction stating the number of kilograms of explosive to be placed in each hole or the final stemming length required must be given to the explosive supplier.
30		The initial blasts should be checked and approved by a senior person on site. The purpose of the exercise is to spot potential problems to allow these to be corrected before a blast is set off. This helps ensure compliance with design and addresses “finger problems” such as overfilled holes, underburdened holes, short stemmed holes etc. These oversights need to be managed accordingly as any errors at this stage can have knock on effects that can increase disturbance levels significantly.
31		Ongoing QC controls in the field must be implemented by the explosive supplier. The blaster in charge should police this to ensure that this happens.
32		The tie up should be carried out according to the blast plan to ensure that the timing and sequencing of the blast proceeds as planned.
33		Exercise ongoing care and control during all stages of the drilling and blasting operation. Check, check and check again.
34	Other Considerations	The allowable vibration level will be a combination of damage and complaint factors. It is therefore essential that good relations be maintained with the public in the vicinity of blasting operations to help manage the ‘negative’ perceptions.

No	Issue	Management commitment
35		It is advisable to schedule the blast for a time when the least number of people are likely to be at home. Avoid blasting early in the morning or late in the afternoon when school children and many adults are home. These are also the worst 'climatic' times to set off a blast.
36		Clear notification of blast times and location should be given. This information should be posted at the entrance to the pits for information of mine personnel. The blast times should also be made available to members of the community as good neighbourliness is important.
37		A pre blast crack damage survey should be considered. The purpose of the pre-blast survey is to describe, photograph and document the crack damage in the structures. Cracks occur in most structures but the owners are usually unaware of them. However, as soon as blasting starts any cracks that are then noticed are immediately attributed to the blasting.
38		The mandatory safety requirements (clearing the area, posting guards, closing of roads, evacuating the people from the school and retirement home, making safe etc.) must be defined and implemented by the mine management.
39		The closest houses to the pits may need to be evacuated when blasting takes place at the eastern end of the central pit and in the eastern pit. This will need to be planned in advance and well-coordinated.

7.7
Biodiversity
MP

7.7 BIODIVERSITY MANAGEMENT PLAN

To understand biodiversity one must appreciate all of its components. It is not just about the species of plants and animals and the different habitats in which they live (biodiversity patterns), but also the way that factors, such as wind, water, steepness of slope and presence of pollinators, affect the habitats and the species living in them (ecosystem processes).

Due to the existing, historical damage on site, the re-use of damaged areas and the non-toxic nature of the tailings, the potential impacts on vegetation were found to be relatively low despite the location in the Karstveld Otavi Mountainlands, which carry a highly diverse flora with many species of conservation importance.

The commitments derived from the Scoping Report with regards to Biodiversity form the basis of this MP.

7.7.1 COMPONENTS

This plan is made up of the following components:

- Managing the general disturbance and physical destruction of biodiversity; and
- Managing the spread of alien invasive species.

7.7.2 MANAGEMENT

7.7.2.1 General Disturbance Physical destruction of biodiversity

Objectives

The objective of the management measures is to prevent or limit the unacceptable loss of biodiversity and related functionality through general disturbance and physical destruction.

Actions

TABLE 7-14: ACTIONS RELATING TO THE GENERAL DISTURBANCE AND PHYSICAL DESTRUCTION OF BIODIVERSITY

No	Issue	Management commitment
These commitments apply to <u>design phase</u>		
1	Physical destruction of biodiversity	Keep footprint of project as small as possible and enforce the operational boundaries through highly visible signs and regulatory mechanisms such as fines or similar.
2	TSF Options	<ul style="list-style-type: none"> • Trigon to investigate the possibility of combining TSF Options 3 and 4 (see section 6.2), thereby reducing option 4, if possible. • Consideration should be given to relocating <i>Aloe zebrina</i> populations that will be destroyed. In addition the loss of <i>Searsia lancea</i> trees

No	Issue	Management commitment
		could be offset by planting this species, which is commercially available.
These commitments apply to <u>construction and operation phase</u>		
3	Physical destruction of biodiversity	Unnecessary collateral damage due to large construction vehicles should be controlled by the environmental manager on site, particularly during development of the new facilities.
4		The large protected trees in the active area previously mentioned should be retained and protected. It is likely that new staff parking areas and other facilities not yet considered will have to be provided. These should not be permitted to affect those individuals, which should be mapped as soon as possible and their localities shared with mine planning personnel.
5		Raise awareness through awareness campaigns and training of key staff.
6		With regards to the TSF and WRD that will remain in perpetuity, a restoration plan should be compiled in consultation with a suitably qualified specialist. This plan should include monitoring in the post-operative phase to ascertain the effectiveness of the implementation of the restoration plan.
These commitments apply to <u>construction, operation and decommissioning phases</u>		
7	General disturbance of biodiversity	The working area of the mine will be fenced.
8		Develop a policy that limits independent movements by staff into the veld outside the fenced-in mining site. Strictly prevent poaching and harvesting, including of firewood, or possession of any such natural materials.
9		Allow only mining personnel, service providers and construction staff, as well as registered mine visitors on site.
10		Train all mine staff to appreciate the values of biodiversity, as well as legislation relating to protected species.
11		Raise awareness concerning recognising venomous snakes (of which there are some extremely venomous in the area) and invertebrates (scorpions) from non-dangerous ones, and ensure that sufficient personnel are trained to handle snakes/invertebrates so as to move them away from the mine without killing them.
12		Drivers must be licensed, and given regular awareness training on the need to keep to speed limits, keep on designated tracks. Some form of speed monitoring should be implemented. Limit night time driving.
13		Use yellow outdoor lights (sodium vapour floodlights with orange covers, or yellow bulbs/tubes for incandescent and fluorescent lights) wherever possible as this is less glaring to invertebrates while serving human requirements.

No	Issue	Management commitment
14		If automated, UV-attractant pest management devices have to be deployed, such systems should be either kept indoors (e.g. in maintenance sheds, inside administrative blocks, or inside production plants) or should be covered with wire mesh to ensure that only target organisms of the right size are electrocuted.
15		Ensure that animals have no access to contaminated water sources.
16		Fence in TSF, PCD and other areas that are regularly artificially wetted and use other proven means to deter birds from reaching them. Try to avoid pooling of mine related water.
17		All chemicals, emissions, and leaching products must be strictly contained and regularly and timely cleaned or neutralised, adhering to best practices.
18		Develop a site waste management policy and actively enforce it.
19		Develop policy for the management of hazardous materials and actively enforce it.
20		Provide temporary waste deposition facilities on site (rubbish bins, skips), which are secure from scavengers, storms, or other disturbance (especially jackals and badgers).
21		Provide adequate toilet facilities for all workers at work sites.
22		Where possible, avoid destroying trees or disturbing their proximity, so that animals can continue to use them
23		Major spillage incidents will be handled in accordance with the Trigon emergency response procedure.
24		Certain instances of injury to animals may be considered emergency situations. These will be managed in accordance with the Trigon emergency response procedure.
25	Monitoring	The health of the vegetation around springs in the vicinity should be monitored, starting with a baseline assessment before dewatering proceeds.
These commitments apply to <u>decommissioning & closure phases</u>		
26	Closure planning	As part of closure planning, the designs of any permanent and potentially polluting structures will take consideration of the requirements for long term pollution prevention and confirmatory monitoring. Dispose of re-usable waste (such as power cables, pipelines and building material) in the appropriate manner (recycling is preferable).

No	Issue	Management commitment
		A mine rehabilitation and closure plan must be developed and updated at least every two years, and adequate provision made for decommissioning and closure.

7.7.2.2 Managing the spread of alien invasive species

Objectives

The objective of the mitigation measures is to prevent, as far as is possible, further spread of alien invasive species and to improve current situation on site.

Actions

TABLE 7-15: ACTIONS RELATING TO THE SPREAD OF ALIEN INVASIVE SPECIES

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning phases</u>		
1	Invasive Aliens	Urgent attention should be given to ongoing clearing of alien invasive species on the mine site and on any other properties (such as domestic housing) owned by the mine. <i>Leucaena leucocephala</i> (Wonderboom), <i>Cryptostegia grandiflora</i> (Rubber Vine), and <i>Tecoma stans</i> (Yellow bells) are of particular concern right now.
2		Consideration should be given to collecting mature seed of important local tree species and dispersing them down the slopes of the old TSF as well as in the containers there. The Prosopis trees that were planted on the old TSF in the early 1980s should be cut down and carefully painted with Garlon® to rid the area of this invasive species

7.8
Visual
MP

7.8 VISUAL MANAGEMENT PLAN

Additional mining infrastructure has the potential to alter the landscape character of the site and surrounding area through the establishment of both temporary and permanent infrastructure.

The general area where the project will be implemented has already been disturbed by the old Kombat mine, and associated infrastructure, the town of Kombat and other developments. The landscape character has therefore already been impacted along this section of the B8 road, i.e. within the specific location of the project area, and therefore reduced the visual resource in this area.

7.8.1 COMPONENTS

This plan is made up of the following component:

- Visual disturbance.

7.8.2 MANAGEMENT

7.8.2.1 Visual disturbance

Objectives

The objective of the management measures is to limit visual impacts.

Actions

TABLE 7-16: ACTIONS RELATING TO VISUAL DISTURBANCE

No	Issue	Management commitment
These commitments apply to <u>design, construction, operation and decommissioning phases</u>		
1	Earthworks	During earthworks, all reasonable measures should be taken to prevent excessive dust.
2		Keep the working footprint to the minimum size possible, and rehabilitate once no longer in use.
3	Haul roads	Implement dust control measures as per the Air Quality Management Plan. Speed limits on unpaved surfaces must be controlled to reduce dust entrainment.
4	Lighting	Light pollution should be carefully considered and kept to a minimum – without compromising safety.
5		The negative impact of night lighting, glare and spotlight effects, can be mitigated using the following methods: <ul style="list-style-type: none"> • Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the project. • Avoid using bright, white colour lights where possible. Preferably use lights emitting a yellow light which travels less than white coloured lights.

No	Issue	Management commitment
		<ul style="list-style-type: none"> Light public movement areas (pathways and roads) with low level 'bollard' type lights and avoid post top lighting. Avoid high pole top security lighting where possible.
6	Materials	Buildings and structures could be painted with a matte finish in a shade of grey or green that would best reduce the colour contrast between the structures and the receiving landscape. Avoid the use of bright colours and shiny finishes, especially on roofs and taller structures.
7	Project Area Development and General	Retain as much as possible of the existing vegetation within the project area.
These commitments apply to <u>decommissioning & closure phases</u>		
8	Mineralised waste	Final shaping and dumping should be implemented such that the sides of the waste facilities are articulated in a fashion that create areas of light and shadow interplay.
9	facilities	Harsh, steep engineered slopes should be avoided if at all possible. It is important that a long-term view of the TSF's integration with the surrounding landscape be taken.
10	Rehabilitation	Rehabilitation of all the faces of the TSF to grass / scrub bushes and some trees;
11		Only indigenous vegetation should be used for rehabilitation / landscaping purposes.
12	Closure	<p>For the closure phase:</p> <ul style="list-style-type: none"> Trigon will maintain a closure plan and closure costing plan; All components of the non-permanent infrastructure used during operation must be removed. The site must be visually 'cleaned up' so as to portray an uncluttered landscape.

7.9
Archaeology
MP

7.9 ARCHAEOLOGY MANAGEMENT PLAN

No visible archaeological artefacts or heritage sites were noted in the vicinity of the proposed project development areas by SLR during the site visits, nor did any of the neighbouring IAPs raise any such concerns during the public participating process, or Trigon find any such sites during the time they've been conducting activities in the relevant area. The area where the proposed activities will be implemented has also been largely disturbed from previous mining activities.

The old German Shaft (i.e. "Otavi Minen und Eisenbahn Gesellschaft") does have heritage value and is located near the Kombat Mine Office. The old Post Office at the vehicle parking at the Kombat Mine Head Office was the first building for the town and the office was the first shop and building owned by the owner in 1911 till 1925 when the mine flooded for the first time in history. A Fig Tree was planted in that days adjacent to the one wall and it invade and took over and grow totally through and over the portion of one wall of the building which was left. The small house and building on the left hand entrance of the Main Security Gate was the Railway Station of Kombat. This was the only 'Eisenbahn' (small track railway line) to the North. (PP – J. Lusse, January 2018)

None of the above mentioned infrastructure will be affected by the proposed project activities.

7.9.1 COMPONENTS

This plan is made up of the following components:

- Chance heritage finds.

7.9.2 MANAGEMENT

7.9.2.1 Chance archaeological finds

Although no heritage site has been identified in the area, it is still possible that sites or items of heritage significance may be found in the course of development work. The personnel and contractor heritage induction process is intended to sensitise people so that they may recognize heritage "chance finds" in the course of their work. The "chance finds procedure is intended to ensure compliance with the relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): " *a person who discovers any archaeological object must as soon as practicable report the discovery to the Council*". The procedure of reporting set out below must be observed so that heritage remains identified in the field are reported to the NHC.

Objectives

To ensure that the correct actions are taken to preserve or document chance archaeological finds.

Actions**TABLE 7-17: ACTIONS RELATING CHANCE ARCHAEOLOGICAL FINDS**

No	Issue	Management commitment
These commitments apply to <u>construction and operation phases</u>		
1	Chance Finds Procedure	<p>The “chance finds” procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person.</p> <p><u>Action by person identifying archaeological or heritage material:</u></p> <ul style="list-style-type: none"> • If operating machinery or equipment - stop work; • Identify the site with flag tape; • Determine GPS position if possible; and • Report findings to foreman. <p><u>Action by foreman:</u></p> <ul style="list-style-type: none"> • Report findings, site location and actions taken to superintendent; and • Cease any works in immediate vicinity. <p><u>Action by superintendent:</u></p> <ul style="list-style-type: none"> • Visit site and determine whether work can proceed without damage to findings; • Determine and mark exclusion boundary; and • Site location and details to be added to project GIS for field confirmation by archaeologist. <p><u>Action by archaeologist:</u></p> <ul style="list-style-type: none"> • Inspect site and confirm addition to project GIS; • Advise NHC and request written permission to remove findings from work area; and • Recovery, packaging and labelling of findings for transfer to National Museum. <p><u>In the event of discovering human remains:</u></p> <ul style="list-style-type: none"> • Actions as above; • Field inspection by archaeologist to confirm that remains are human; and • Advise and liaise with NHC and Police.

No	Issue	Management commitment
2	Otavi Minen und Eisenbahn Gesellschaft	The old German Shaft to be left undisturbed.
3	Training	All workers (temporary and permanent) will be given training on the chance find procedure.

7.10
Traffic
MP

7.10 TRAFFIC MANAGEMENT PLAN

Given that existing infrastructure will be used for the transportation of the ore, and the fact that the maximum road transport would be 3 to 4 trucks per day, the potential road traffic impacts are not considered significant. However, this MP aims to provide measures to ensure impacts are avoided or minimized.

7.10.1 COMPONENTS

This plan is made up of the following component:

- Infrastructure – road use.

7.10.2 MANAGEMENT

Objectives

The objective of the management measures is to increase safety and reduce the potential for vehicle related impacts on road users.

Actions

TABLE 7-18: ACTIONS RELATING TO ROAD USE

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	Road use	A driver trainer programme for all Trigon employees will be implemented to include: complying with speed limits, holding valid licences, ensuring vehicles are roadworthy, zero tolerance for drinking and driving and using lights appropriately for night driving.
2		All road users are required to comply with Namibian Roads Authority regulations.
3		Trigon should liaise with the roads authority regarding maintenance of appropriate signage on the B8.
4	Emergency	Any mine related road accident must be handled in accordance with the emergency response procedure.
5		All legal health and safety requirements will be implemented when transporting hazardous substances to site.
6		Transport companies will comply with all legal requirements for the handling and transport of hazardous substances.

7.11
Socio-economic
MP

7.11 SOCIAL AND ECONOMIC MANAGEMENT PLAN

The activities associated with the mine have socio-economic impacts in the operations and decommissioning and closure phases – some positive and some negative. These impacts relate to amongst others employment/job creation, inward migration of potential job seekers, local- and regional economies, impact on households and infrastructure close to the mine and community safety and security. This MP aims to provide measures to enhance the positive impacts and limits the negatives impacts.

The commitments derived from the Scoping Report with regards to socio-economic issues form the basis of this MP.

7.11.1 COMPONENTS

This plan is made up of the following components:

- Economic Impact;
- Employment and skills development;
- Impacts relating to in-migration; and
- Impacts on households and infrastructure close to the mine.

7.11.2 MANAGEMENT

7.11.2.1 Economic Impact

Objectives

The objective of the management measures is to enhance the positive impacts associated with job creation and investment.

Actions

TABLE 7-19: ACTIONS RELATING TO ECONOMIC IMPACT

No	Issue	Management commitment
These commitments apply to construction, operation and decommissioning phases		
1	Enhance positive economic impacts	Trigon undertakes to use its best endeavours to: <ul style="list-style-type: none"> • Pay market related salaries and wages; • Lobby the Kombat Town owner to enhance the enabling environment to promote local manufacturing of specialised inputs. • Ensure the mine's procurement policy favours Namibian products & services where feasible; • Liaise with local agricultural producers (of beef, game and horticulture) in order to sell goods to the mine and residents. • Use small-scale contractors and labour intensive work, where feasible. • Partner with the Kombat Town owner to maintain roads and communication links in Kombat.

No	Issue	Management commitment

7.11.2.2 Employment and skills development

Objectives

The objective of the management measures is to maximise employment and skills development.

Actions

TABLE 7-20: ACTIONS RELATING TO EMPLOYMENT AND SKILLS DEVELOPMENT

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	Employment opportunities and development benefits.	Develop criteria for defining Project Affected People (PAP), such as residents of Kombat and the Otjozondjupa Region, as part of its hiring policy and then give preference to Project Affected People through recruitment and training.
2		Have not higher than Grade 12 as the minimum employment requirement.
3		Support the Ministry of Education and NAMCOL, to improve education programmes in Otjozondjupa to enable bright potential employees to gain Grade 12.
4		Throughout the life of mine, promote vocational training among school learners with career talks and linking to bursaries.
6		Develop a human resources policy which prioritises the selection of women for training and recruitment and which supports women to perform well in the workplace while balancing their other duties in the family and community.
7		Adhere to the Namibian Chamber of Mines Mining Charter, which states that mining companies must invest at least 2% of their annual gross payrolls every year in developing the skills of historically disadvantaged Namibians.
8		Ensure that employees, and those of its mining and plant contractors, are paid market related wages, with housing allowances that can promote home ownership and contributions to pension contributions and medical aid.
9		Implement a mine procurement policy which promotes the use of small and medium enterprises (SMEs), giving preference to those provided by the neighbouring community, then other Namibian companies.
10		Channel corporate social investment during mining to support the Government's efforts to focus on the most deprived constituencies to address poverty, inequality and exclusion.

No	Issue	Management commitment
11		Through its Corporate Social Responsibility programme, proactively work with the Otjozondjupa Regional Council and other regional stakeholders to raise education standards in early childhood development, primary and secondary levels to enable people to reach their full potential.
12	Emergency situations and mine closure	<p>An unexpected mine closure could lead to a sudden loss of jobs. To mitigate this situation, the mining company will:</p> <ul style="list-style-type: none"> • Promote employees to diversify and upgrade skills so they benefit from being able to offer labour flexibility and productivity, throughout the LoM and on mine closure. • Offer training on personal financial management to all employees throughout the LoM; • Ensure skills upgrading during employment at the mine is documented and accredited where possible so skills are recognised with future employers; • Ensure that the mine closure plan is understood by the workforce and guarantees final salary pay-outs and pension transfers.

7.11.2.3 Impacts relating to in-migration

Objectives

The objective of the management measures is to ensure community health, safety and security.

Actions

TABLE 7-21: IMPACTS RELATING TO IN-MIGRATION

No	Issue	Management commitment
These commitments apply to <u>operation and decommissioning</u> phases		
1	In-migration	Build up local skills
2		Give employment preference to local and Otjozondjupa residents, particularly to women, to reduce the demand for migrants.
3		Conduct job interviews in Kombat and other regional centres (when the local supply has been exhausted) to reduce in-migration.
4		Inform the public about the employment policies and procedures and when vacancies have been filled to reduce potential migrants.
5		Establish regular meetings with the Kombat town caretakers and Otjozondjupa Regional Council, and plan to minimise and manage the potential impacts.

No	Issue	Management commitment
6		Not build a construction camp at site but will enable construction workers to live locally in Kombat and surroundings to boost the local economy, provided appropriate housing is available.
7		Promote and facilitate home ownership by employees, either within the existing community or to be built in their home areas, given the relatively short life of mine.
8		Negotiate with the Ministry of Health and Social Services (MOHSS) to extend elements of Trigon's health care services to the neighbouring community.
9		Establish a comprehensive HIV, AIDS and TB workplace policy and wellness programme which will detail HIV prevention measures in the workplace and enable easy access to AIDS treatment, care and support for employees.
10		Stipulate that tender requirements for all contractors must adhere to Trigon's HIV and AIDS policy and programme and should be part of their reporting requirements.
11		Design a shift work programme which provides sufficient time to enable workers to take trips home on a frequent and regular basis.
12		Support the Ministry of Education in meeting the demand for school places and to raise education standards in the wider area.
13		Establish a local stakeholder committee in partnership with the existing Kombat Town caretakers to assist with the monitoring of social impacts and the effectiveness of the mitigation measures put in place.
14		Have zero tolerance to alcohol in the workplace and breathalyse all personnel arriving for work.
15		Support partnerships that encourage a sense of community and that combat social ills, e.g. multi-purpose community & skills development centres; sports tournaments, social clubs, youth clubs, activities that promote women's empowerment and gender equality and community policing.
16	Emergency situation	Stakeholders are best handled through a transparent Public Consultation and Disclosure Plan which is regularly reviewed to ensure stakeholders' concerns and grievances are addressed promptly.

7.11.2.4 Impact on households and infrastructure close to the mine

Objectives

The objective of the management measures is to ensure community health, safety and security.

Actions

TABLE 7-22: IMPACT ON HOUSEHOLDS AND INFRASTRUCTURE CLOSE TO THE MINE

No	Issue	Management commitment
These commitments apply to <u>operation and decommissioning</u> phases		
1	Impact on households and infrastructure close to the mine	Engage with the affected communities through a process of informed consultation and participation to reach consensus on the definition of who are Project Affected People. There will be a need to distinguish between residents and migrants coming into the area. The best approach is to develop a Public Consultation and Disclosure Plan (PCDP) early on in the process which should detail how the client will receive and address specific concerns including compensation and relocation, grievance mechanisms and dispute resolution.
2		Inform project affected people of their rights concerning resettlement and provide them with technically and economically feasible options for resettlement based on consultations and an assessment of resettlement alternatives. Keeping affected people fully informed of their rights and responsibilities is crucial to the success of resettlement planning so information must be made accessible and understandable, as agreed in the PCDP.
3		In consultation with all interested and affected parties including women and other vulnerable groups, prepare and publicly disclose a Resettlement Action Plan (RAP).
4		Provide affected people with prompt and effective compensation at full replacement value for loss of assets due to project activities.
5		Provide assistance with relocation expenses (moving allowances, transportation, special assistance and health care for vulnerable groups) where physical relocation is necessary.
6		Develop a detailed fire management policy and ensure all employees/contractors regularly undertake practice fire drills.
7		Provide temporary housing, permanent housing sites, and resources (in cash or in kind) for the construction of permanent housing—inclusive of all fees, taxes and utility connection charges—or, as required, agricultural sites for which a combination of productive potential, locational advantages, and other factors are at least equivalent to the advantages of the old site.

No	Issue	Management commitment
8		Ensure the households (i.e. residents of the affected houses) end up no worse off than currently, and are preferably better off than they were before the project was undertaken.
9	Emergency situation	Stakeholders are best handled through a transparent Public Consultation and Disclosure Plan which is regularly reviewed to ensure stakeholders' concerns and grievances are addressed promptly.

7.12

Resource

MP

7.12 RESOURCE MANAGEMENT PLAN

This MP provides management actions regarding scarce resources like water and provides suggestion for reducing consumption of resources.

7.12.1 COMPONENTS

This plan is made up of the following components:

- Consumption of water; and
- Consumption of fuel.

7.12.2 MANAGEMENT

7.12.2.1 Consumption of water

Objectives

The objective of the management measures is to monitor the water consumption and to optimise water usage.

Actions

TABLE 7-23: ACTIONS RELATING TO WATER CONSUMPTION

No	Issue	Management commitment
These commitments apply to <u>all phases</u>		
1	Water usage and control	Refer to the actions in the Groundwater MP.
2		Install and calibrate water flow meters on pipes at selected locations (where required)
3		Monitor monthly abstraction volumes to ensure that the permitted monthly and annual volumes are not exceeded.
4	Maintenance of equipment	Regularly inspect and maintain tanks, tankers, pumps and pipes.
5	Monitoring of water leaks	Checking for water leaks daily. Report water losses.
6	Training and awareness	Maintain and implement water awareness programme for Trigon employees and contractors.
These commitments apply to <u>operation and decommissioning only</u>		
7	Water usage and control	Ensure that stormwater falling inside the processing area is captured and directed to the relevant dam for containment and reuse.
These commitments apply to <u>operations only</u>		

No	Issue	Management commitment
8	Water usage and control	Ensure that the design of the relevant clean and dirty water systems are sufficient to cater for the water volumes associated with the infrequent flood events and that unacceptable discharges of polluted water are prevented.
9		Optimise the recycling of water in processing phase to reduce the demand for fresh water.

7.12.2.2 Consumption of fuel

Objectives

The objective of the management measures is to monitor the fuel consumption and to find ways to optimise fuel usage.

Actions

TABLE 7-24: ACTIONS RELATING TO FUEL CONSUMPTION

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u>		
1	Fuel consumption	Maintain and implement the preventive maintenance plan for all equipment and mine vehicles using diesel, petrol and gas on site to avoid wastage and leakages.
2		Monitor fuel consumption in all departments.

7.13

Soil

MP

7.13 SOIL MANAGEMENT PLAN

Management of soils is important as mining is a temporary land use where-after rehabilitation is the key to re-establishing post closure land capability that will support conservation, agricultural and tourism type land uses. Soil is a key part of rehabilitation. The general area where the project will be implemented has already been disturbed by the old Kombat mine, and associated infrastructure and little topsoil is available from previous activities. Any available topsoil therefore needs to be conserved for future use (i.e. closure).

7.13.1 COMPONENTS

This plan is made up of the following component:

- Topsoil stockpiling/management.

7.13.2 MANAGEMENT

7.13.2.1 Topsoil stockpiling/management

Objectives

The objective of the management measures is to ensure that all topsoil stripping, stockpiling and replacement operations will be undertaken in a manner that limits impacts on the soil functionality and to ensure it can be used for rehabilitation as and when required.

Actions

TABLE 7-25: ACTIONS RELATING TO TOPSOIL STOCKPILING/MANAGEMENT

No	Issue	Management commitment
These commitments apply to <u>construction phase</u>		
1	Topsoil removal and stockpiling	A few, relatively small, topsoil stockpiles (with very little topsoil) exist at the Kombat site. These stockpiles need to be preserved, and those falling within the footprint of the proposed development need to be relocated.
2		Strip topsoil in relevant areas before mining (including the areas where the WRDs and the TSF will be located) and stockpile for restoration use after mining.
3		Once mining is completed (or during the LoM where relevant), replace topsoil on affected areas according to a comprehensive restoration plan (to be developed as part of the mine closure planning).
4		Stripping will only occur where soils are to be disturbed by activities that are described in the design report.
5		Soils should preferably be handled in dry weather conditions so as to cause as little compaction as possible.

No	Issue	Management commitment
6		The "Utilisable" soil should be stripped to a depth of 750mm where possible or until hard rock/calcrete is encountered. These soils will be stockpiled together with any vegetation cover present (only large vegetation to be removed prior to stripping).
7		Stockpiling areas will be identified in close proximity to the source of the soil to limit handling and to promote reuse of soils in the correct areas.
8		Soils stockpiles will be demarcated, and clearly marked to identify both the soil type and the intended area of rehabilitation.
These commitments apply to <u>operations phase</u>		
9	Topsoil stockpile	Implement measures, such as seeding or inert rock cladding, the stockpiles to prevent erosion thereof.
10	management	Stockpiles will be established/engineered with stormwater diversion berms in place to prevent erosion.
11		Soil stockpile and berm heights will be restricted where possible to <1.5m to avoid compaction and damage to the soil seed pool. However, depending upon the footprint of the intended stockpiles, where stockpiles higher than 1.5m cannot be avoided, these will be benched to a maximum height of 15m. Each bench should ideally be 1.5m high and 2m wide. For storage periods greater than 3 years, vegetative or rock cover is necessary. The stockpile side slopes should be stabilised at a slope of 1 in 6. This will promote vegetation growth and reduce run-off related erosion.
12		Equipment, human and animal movement on the soil stockpiles should be limited to avoid topsoil compaction and subsequent damage to the soils and seedbank.
These commitments apply to <u>decommissioning and closure phases</u>		
13	Rehabilitation of Disturbed land & Restoration of	Stockpiled soil will be used to rehabilitate disturbed sites either ongoing as disturbed areas become available for rehabilitation and/or at closure. The stockpiled topsoil must be placed on the rehabilitated areas to 300 – 500 mm deep and contoured to achieve an approximate free draining surface profile.
14	Soil Utilisation	The stockpiled soils will be analysed to determine the nutrient status and chemistry. Based on the analysis, fertilisers will be applied if necessary.
15		Erosion control measures will be implemented to ensure that the soil is not washed away and that erosion gulleys do not develop prior to vegetation establishment.
16		If soil (whether stockpiled or in its undisturbed natural state) is polluted, the first management priority is to treat the pollution by means of in situ bioremediation.
17		If <i>in situ</i> treatment is not possible then the polluted soil must be placed in bins and transported to a licenced hazardous landfill facility.

7.14
Waste Management
MP

7.14 WASTE MANAGEMENT PLAN

Waste is generated during all phases of the mine. This MP deals with solid waste management.

7.14.1 COMPONENTS

This plan is made up of the following components:

- Non-hazardous solid waste (non-mineralised);
- Hazardous solid waste (non-mineralised); and
- Medical waste.

7.14.2 MANAGEMENT

7.14.2.1 Non-hazardous solid waste (non-mineralised)

Objectives

The objective of the management measures is to ensure proper storage, recycling, re-using, removal, transportation and disposal of non-hazardous solid waste.

Actions

TABLE 7-26: ACTIONS RELATING TO NON-HAZARDOUS SOLID WASTE (NON-MINERALISED)

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	General	The waste management procedure for Trigon must cover the recycling, re-use, storage, handling, transportation and disposal. Ensure that the contractors responsible for the above are made aware of these procedures.
2	Collection of waste	Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity. Receptacles must have lids to prevent wind borne litter, or scavenging by animals.
3	Waste handling / disposal – General (domestic waste)	Determine what recycling initiatives are feasible on site and in the area. All recyclable waste must be separated at source into the relevant containers, before being removed to wheelie bins or luggar bins and skips.
4		Provide the recyclable materials to agencies that can utilise them – where possible.
5		Non-recyclable, general waste will be collected and be disposed within the existing general landfill site or the proposed new TSF.
6		The Central Pit might potentially overlap, in future, with the northern section of the landfill site. In this scenario, the waste will be removed from this facility and

No	Issue	Management commitment
		disposed of on a dedicated area in the proposed new TSF (on already disposed tailings material, without compromising the liner). The remainder of the void (not part of the central pit will be closed with waste rock and rehabilitated.
7	Waste handling / disposal – Empty oil and reagent drums (cleaned drums).	Washed/neutralised drums are to be separated into salvageable and non-salvageable groups. Non salvageable drums (and drums that contained hazardous materials) should be flattened and sold as scrap or disposed of within the existing general landfill site.
8	Waste handling / disposal – Scrap metal	Dedicated labelled bins to be placed in demarcated areas at each of the waste generating points
9		Remove all oil, grease and petroleum products.
10		Scrap metal to be sold to relevant companies through an appointed contractor.
11	Waste handling / disposal – Garden waste	Move to designated composting area (to be used as part of progressive rehabilitation).
12	Old tyres that cannot be re-treaded and conveyors.	Disposed within the existing general landfill site (as per the Trigon waste management procedure).
13	Managing the (existing) general waste site	Trigon will continue to use the existing general Landfill (waste) site, located adjacent (south) of the proposed central pit) to dispose of general / non-hazardous waste (that cannot be recycled) only.
14		The site is to be fenced off and access controlled.
15		The fence will be maintained to prevent the scavenging by people.
16		Dispose of waste at the on-site landfill facility as follows: <ul style="list-style-type: none"> • Only non-hazardous waste that cannot be recycled to be placed in the landfill facility. • Place the food scraps in the landfill (containment pits) in a distinct area and cover it with earthen fill daily to avoid animals being attracted and scavenging from these food scraps. • Compact the other waste and temporarily cover material that can become airborne from wind with a thin layer of soil/ inert waste rock. Additional refuse may be placed on top of the thin earthen fill layer and this sequence may be repeated several times. A cover consisting of 150 mm of material should be placed over the waste.

No	Issue	Management commitment
		<ul style="list-style-type: none"> Waste should rather be compacted by passing heavy equipment over the deposited waste, to reduce the voids in waste and the overall volume. Compaction is best achieved if the waste is spread in thin layers and compacted by a purpose-built landfill compactor. Windblown litter must be picked up and removed from fences and vegetation.
17	Waste classification (domestic and industrial)	A waste inventory should be maintained.

7.14.2.2 Hazardous solid waste (non-mineralised)

Objectives

The objective of the management measures is to ensure proper storage, removal, transportation and disposal of hazardous solid waste.

Actions

TABLE 7-27: ACTIONS RELATING TO HAZARDOUS WASTE (NON-MINERALISED)

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	General	The waste management procedure for Trigon will cover the storage, handling, and transportation of waste. Ensure that the contractors responsible are made aware of these procedures.
2	Collection of waste	Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity.
3	Waste storage	Ensure that hazardous waste is kept covered, in impermeable bunded areas until it can be removed from site to the hazardous facility (i.e. Windhoek/Kupferberg).
		Store empty print cartridges in a designated box at the office assistant's desk until removal from site.
4		Store fluorescent tubes in a special labelled steel drum.
5		Collect and accumulate other hazardous waste i.e. car batteries, miscellaneous batteries, oil filters, etc. until such time that the amounts can be removed from site.

No	Issue	Management commitment
6		All explosive bags are to be collected together and safely burnt at the dedicated site (i.e. magazine site) according to permit conditions and procedures.
7		Place oil and greasy cloths and rags into a steel drum and when full transported off site to the hazardous waste site.
8		The yard will have a dedicated used oil storage area that will include an impermeable concrete slab, bunding, an oil trap and sump.
9		Keep empty reagent bags/drums (for a short period of time) at the reagents store until removed by the reagent contractor for refills.
10		Ensure that waste storage areas and/or containers meet the risk needs for that specific waste (e.g. impervious floor, bunded areas with drainage/containment systems, lids to prevent light material from blowing away or sealed containers for hazardous material).
11	Waste classification	An inventory of wastes will be compiled and will include estimated quantities of waste. The inventory will be kept up to date.
12	Disposal of Treated timber crates, printer cartridges, batteries, fluorescent bulbs, paint, solvents, empty hazardous material containers (not cleaned), etc.	Hazardous waste will be disposed of at a permitted hazardous waste disposal site (most likely in Windhoek).
13		No Hazardous waste will be disposed of on the TSF.
14	Disposal of hydrocarbons (oils, grease)	Used oil will be sent to a reputable recycling company for recycling.
15	Disposal of materials contaminated with oils and greases	Disposed of at a permitted hazardous waste disposal site.
16		Oil contaminated soil will be bioremediated.
17	Disposal records	Written evidence of safe disposal of waste will be kept.

7.14.2.3 Medical waste

Objectives

The objective of the management measures is to ensure proper storage, removal, transportation and disposal of medical waste.

ACTIONS**TABLE 7-28: ACTIONS RELATING TO MEDICAL WASTE**

No	Issue	Management commitment
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	General	The medical waste handling procedure for Trigon will cover the storage, handling, and transportation of all medical waste. Ensure that the contractors responsible are made aware of these procedures.
2	Disposal	Incinerate the medical waste at an approved medical facility.

8 PARTIES RESPONSIBLE FOR THE IMPLEMENTATION OF THE EMP

This section describes the roles and responsibilities for implementing the various management plans.

8.1 GENERAL MANAGER

The Kombat Mine General Manager has overall responsibility for environmental management on the mine and for ensuring this EMP is implemented. To assist the General Manager, Kombat will have an Environmental Manager / Officer that will be dedicated to managing and monitoring the environmental issues associated with the mine's activities.

The General Manager must ensure the Environmental Management Plan is included in all contracts and to ensure that contractors adhere to the conditions of the EMP.

Contract documents should consider the inclusion of penalties for non-conformance to the EMP, or to link the sign off of the Contract to a retainer clause. The client retains part of the contract fees until Trigon's appointee (Environmental Manager / Officer) has signed off the clearance certificate, indicating satisfaction with the rehabilitation of the Contractor's work and laydown area.

8.2 ENVIRONMENTAL DEPARTMENT

The Kombat Environmental Manager / Officer will be responsible for assisting the General Manager and various other managers in all environmental and community issues, and specifically to ensure that the commitments as set out in this EMP are implemented during the design, operations, decommissioning and closure phases.

In addition to the above, the Environmental Officer is responsible for ensuring that all persons involved with the Kombat Mine comply with this EMP.

The Environmental Manager / Officer will be responsible for the following aspects related to compliance of this EMP:

- Regular inspections and auditing compliance to this EMP and any other relevant legal requirements e.g. permits and authorisations.
- Conduct environmental awareness training during induction training and on an ad hoc basis thereafter.
- Conduct scheduled monitoring as outlined in section 9 as well as any additional monitoring required by permit and authorisations issued to Trigon by relevant authorities.

- Ensure compliance to this EMP and permits and authorisations issued to Trigon by relevant authorities. Ensure responsibilities and target dates are developed for each one of the commitments in this EMP. This will be through one of the following mechanisms:
 - Design requirements; or
 - Construction tender documents and contracts.
 - Management system / procedure
- Submit required information to relevant authorities such as reporting related to monitoring and with regard to compliance with the EMP, permit and relevant authorisations.
- Liaise with Trigon Management and various external stakeholders such as authorities and interested and affected parties on environmental management (where required).

8.3 CONTRACTORS

All contractors and their sub-contractors and employees will be contractually required to comply with the various commitments in this EMP.

8.4 EXTERNAL SPECIALISTS

Trigon may appoint external environmental specialists, as and when required, to assist with the implementation of certain commitments made in the various management plans.

An independent auditor will also assess compliance against the EMP on an annual basis.

9 MONITORING AND AUDITING

9.1 MONITORING

The management plans in Section 7 have covered various aspects of the proposed monitoring. This section both augments those requirements and sets further detail where relevant. Trigon will develop detailed monitoring procedures including the relevant monitoring commitments spelled out in this EMP.

As a general approach, the monitoring procedures will comprise the following:

- A formal procedure;
- Appropriately calibrated equipment – regular inspections and calibration of equipment will be undertaken in line with the equipment calibration/validation procedure;
- Where samples require analysis, they will be preserved according to laboratory specifications;
- Where practical, an accredited, commercial laboratory will undertake sample analyses;
- Parameters to be monitored can be identified in consultation with a specialist in the field and/or the relevant authority;
- If necessary, following the initial monitoring results, certain parameters may be removed from the monitoring programme in consultation with a specialist and/or the relevant authority;
- Monitoring data will be stored in a structured database;
- Data will be interpreted and reports on trends in the data will be compiled on a quarterly basis; and
- Both the data and the reports will be kept on record for the life of mine.

As a general comment, if monitoring points become damaged or redundant then they can be replaced with new points.

9.1.1 WATER MONITORING

9.1.1.1 Groundwater monitoring (and model update)

Trigon should establish a local groundwater monitoring network aiming at monitoring the cone of drawdown created by dewatering and water supply activities and potential groundwater contamination from pollution sources such as TSF, Processing Plant, Mine Pits and Landfill Site. The location and number of monitoring boreholes to be drilled has still to be determined but a tentative monitoring plan is presented in Figure 9-1 below.

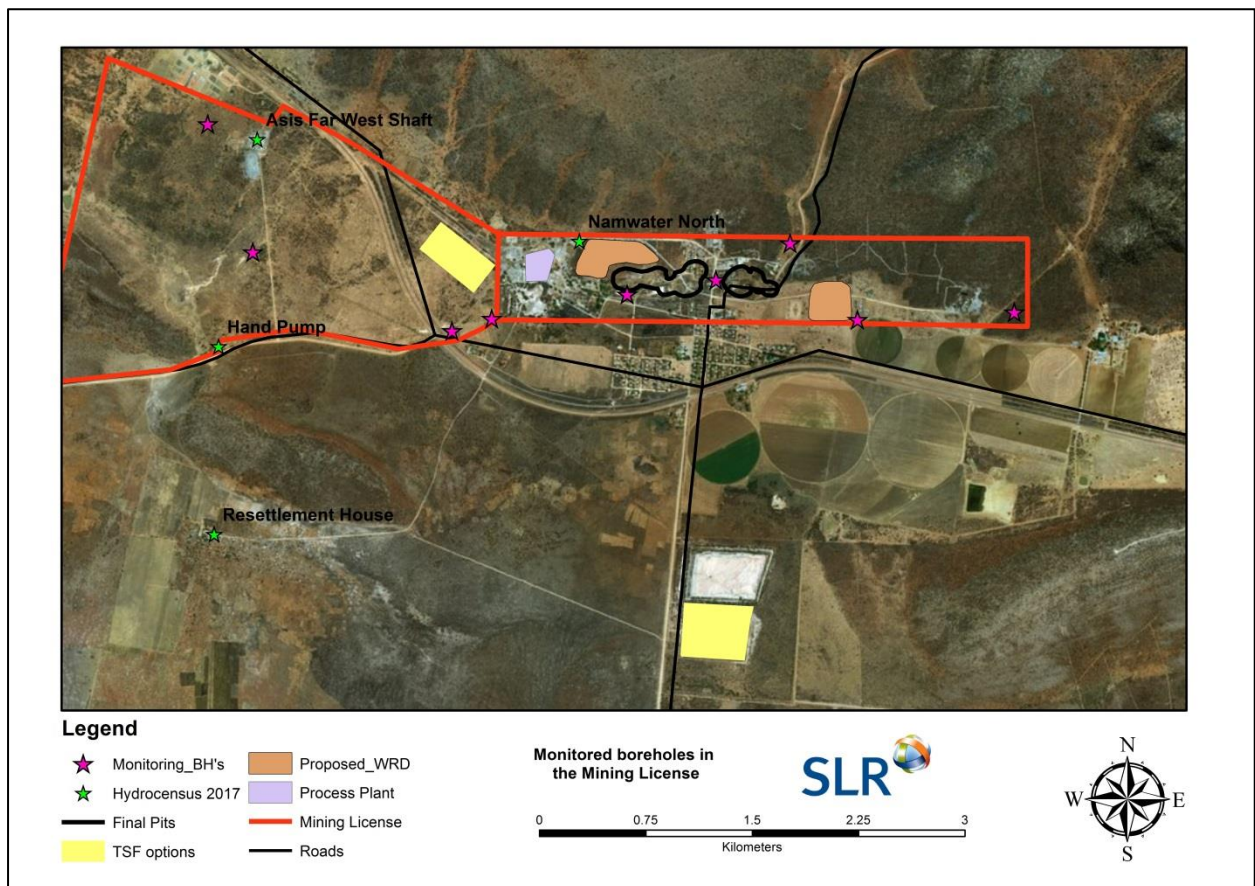


FIGURE 9-1: TENTATIVE LOCATIONS OF MONITORING BOREHOLES IN THE CLOSER MINING AREA

In addition, existing boreholes of farms potentially affected by the mining activities should also be monitored. Figure 9-2 shows the expected maximum extent of the drawdown area caused by cumulative pumping (refer to Scoping Report - Scenario 1). It is recommended to monitor existing boreholes on farms within and adjacent to the cone of drawdown. Monitoring includes groundwater sampling and the measuring of groundwater levels where possible.

The following farms, as a minimum (where boreholes exist) needs to be included in the monitoring programme:

- Gross Otavi; Sommerau; Johannestal; Awagobib; Asis Ost; Nehlen; Schentelsfarm; Blumental; Rendezvous; Meatco-Buschbrunnen; Rietfontein; Guchab; Kombat Suid; Segen; Eggert; and Naueis.

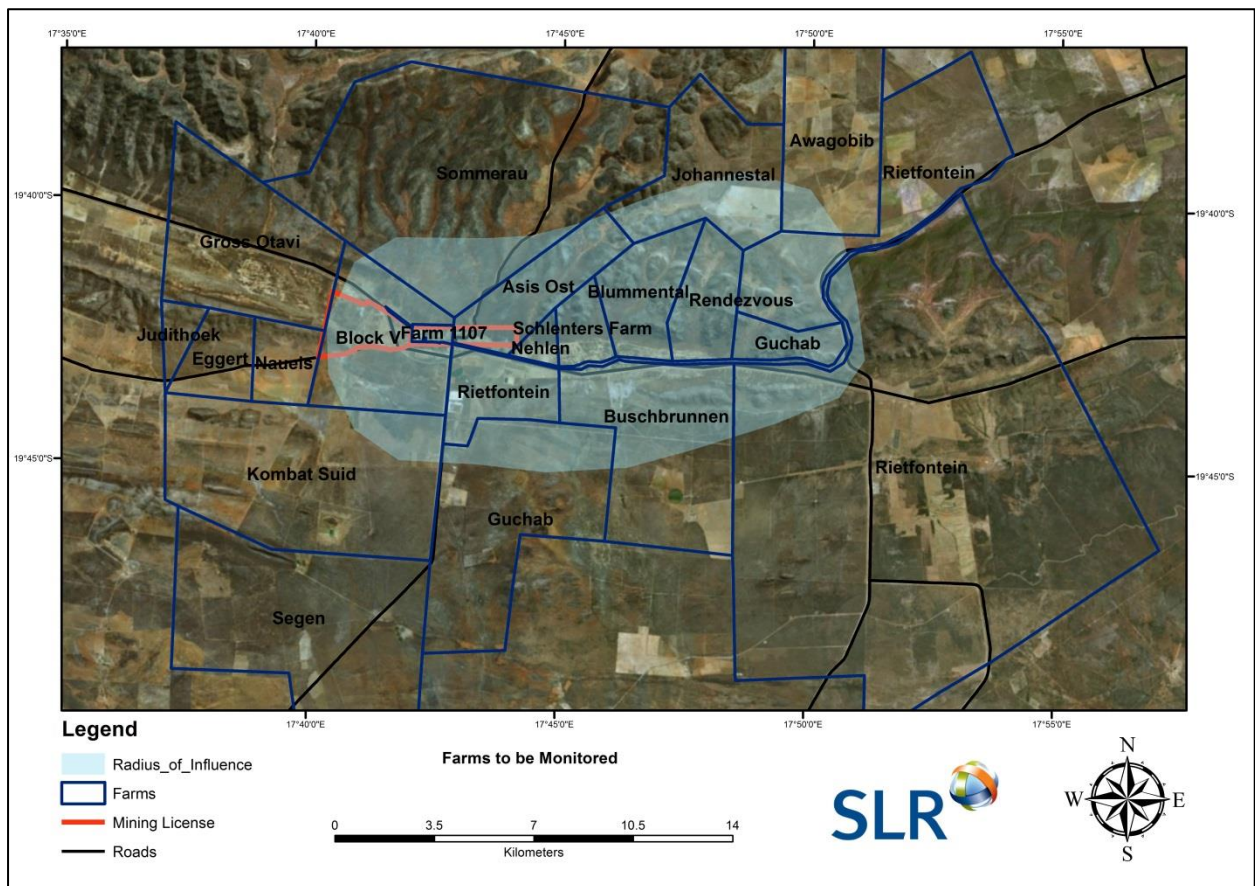


FIGURE 9-2: TENTATIVE LOCATIONS OF MONITORING BOREHOLES IN THE CLOSER MINING AREA

The monitoring frequency for the local monitoring boreholes network, operated by the mine, is quarterly. The regional monitoring boreholes on neighbouring farms should be visited twice a year.

The chemical parameters to be analysed for groundwater monitoring are presented in Table 9-1.

TABLE 9-1: CHEMICAL PARAMETERS TO BE ANALYSED FOR GROUNDWATER MONITORING

Kombat Copper Sampling Parameters			
MAJOR IONS	UNIT	TOTAL METALS	UNIT
Analytical Laboratory		DDScience	
pH		Aluminium as Al	µg/l
Electrical Conductivity	mS/m	Antimony as Sb	µg/l
Turbidity	NTU	Arsenic as As	µg/l
Total Dissolved Solids (calc.)	mg/l	Barium as Ba	µg/l
P-Alkalinity as CaCO ₃	mg/l	Beryllium as Be	µg/l
Total Alkalinity as CaCO ₃	mg/l	Bismuth Bi	µg/l
Total Hardness as CaCO ₃	mg/l	Boron as B	µg/l
Ca-Hardness as CaCO ₃	mg/l	Cadmium as Cd	µg/l
Mg-Hardness as CaCO ₃	mg/l	Chromium as Cr	µg/l
Chloride as Cl	mg/l	Cobalt as Co	µg/l
Fluoride as F	mg/l	Copper as Cu	µg/l
Sulphate as SO ₄	mg/l	Iron as Fe	µg/l
Nitrate as N	mg/l	Lead as Pb	µg/l
Nitrite as N	mg/l	Lithium as Li	µg/l
Sodium as Na	mg/l	Manganese as Mn	µg/l
Potassium as K	mg/l	Mercury Hg	µg/l
Magnesium as Mg	mg/l	Molybdenum as Mo	µg/l
Calcium as Ca	mg/l	Nickel as Ni	µg/l
Free and saline ammonia	mg/l	Selenium as Se	µg/l
Stability pH, at 25°C		Strontium as Sr	µg/l
Langelier Index		Tellurium as Te	µg/l
Ryznar Index		Tin as Sn	µg/l
Corrosivity ratio		Titanium as Ti	µg/l
		Uranium as U	µg/l
		Vanadium as V	µg/l
		Zinc as Zn	µg/l

The numerical groundwater model should be updated once additional monitoring data (rainfall, water levels, groundwater abstraction data and water quality data) become available, usually every second year.

9.1.1.2 Surface Water

During run-off events, water samples should be collected from clean water channels and analysed against guideline values to ensure that no contaminated surface water is released into the environment.

During the rainy season, water from the PCD should be regularly (monthly) analysed and tested for contaminants that would prevent the use as dust suppressant on the mine site. Parameters to be analysed are the same as for groundwater monitoring (Table 9-1).

A weather station should be established and maintained on site and rain gauges installed at strategic locations in the catchment.

9.1.2 AIR QUALITY MONITORING

Key performance indicators against which progress of implemented mitigation and management measures may be assessed form the basis for all effective environmental management practices. In the definition of key performance indicators, careful attention is usually paid to ensure that progress towards their achievement is measurable, and that the targets set are achievable given available technology and experience.

Performance indicators are usually selected to reflect both the direct source of the emission (source monitoring) and the impact on the receiving environment (ambient air quality monitoring). For instance, ensuring that no visible evidence of windblown dust exists represents an example of a source-based indicator, whereas maintaining off-site dustfall levels to below 600 mg/m²/day represents an impact- or receptor-based performance indicator.

Ambient Air Quality Monitoring

Recommended dustfall and PM₁₀ monitoring locations are presented in Figure 9-3. It is recommended that continuous dustfall monitoring at 12 locations, and PM₁₀ monitoring at 3 locations be conducted as part of the Project's air quality management plan. This should be undertaken throughout the Project duration to provide air quality trends. The coordinates and description of these locations, as well as the monitoring methodology is included in the Air Quality Assessment report (Airshed, 2017) appended to the Scoping Report.

The 250 m buffer distance from proposed activities at Kombat Central and Kombat East opencast areas is indicated with a yellow dotted line in Figure 9-3. The receptors falling within the 250 m separation distance outside of the Mine Licence Area must be monitored throughout the Life of Mine (LOM) and in the case of unacceptable exceedances (more than 4-days per year of the recommended daily Air Quality Limit of 75 µg/m³), these must also be relocated.

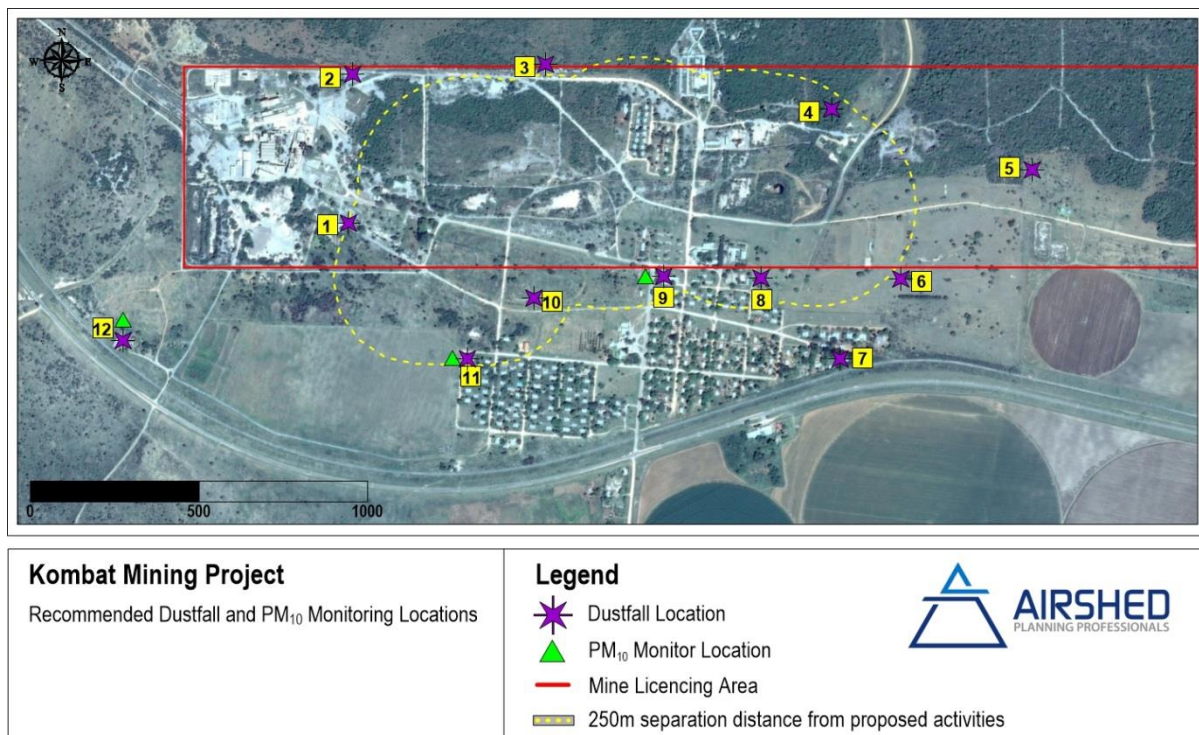


FIGURE 9-3: RECOMMENDED AMBIENT AND DUSTFALL MONITORING NETWORK AT KOMBAT MINE

9.1.3 NOISE MONITORING

Noise monitoring at sites where noise is an issue or may become an issue is essential. The sites listed in Table 9-2 should be included in the annual environmental noise monitoring programme to be conducted annually.

Also, in the event that noise related complaints are received short term (24-hour) ambient noise measurements should be conducted as part of investigating the complaints. The results of the measurements should be used to inform any follow up interventions. The investigation of complaints should include an investigation into equipment or machinery that likely result or resulted in noise levels annoying to the community. This could be achieved with source noise measurements.

TABLE 9-2: RECOMMENDED NOISE MONITORING POINTS FOR INCLUSION IN ANNUAL NOISE MONITORING PROGRAMME

NR No.	Description	Coordinates		Site inclusion in monitoring programme	
		Longitude	Latitude	Years with mining at Kombat Central	Years with mining at Kombat East

1	Structure directly north of Kombat Central pit footprint, inside ML area	17 42.748' E	19 42.495' S	✓	✓
2	Kombat Town, closest residence to Kombat Central, inside ML area	17 42.765' E	19 42.667' S	✓	-
3	Kombat Town, closest residence to Kombat Central, outside ML area	17 42.795' E	19 42.74' S	✓	-
4	Kombat Town, closest residence to Kombat East, inside ML area	17 42.92' E	19 42.691' S	-	✓
5	Kombat Town, closest residence to Kombat East, outside ML area	17 42.937' E	19 42.735' S	-	✓
6	Kombat Town, closet residence to processing plant, outside ML area	17 42.473' E	19 42.879' S	✓	✓
7	Kombat Town centre, outside ML area	17 42.789' E	19 42.87' S	✓	✓
13	Project Relocation area, outside ML area	17 42.696' E	19 42.752' S	✓	✓

The following procedure should be adopted for all noise surveys:

- Any surveys should be designed and conducted by a trained specialist.
- Sampling should be carried out using a Type 1 Sound Level Meter (SLM) that meets all appropriate International Electrotechnical Commission (IEC) standards and is subject to annual calibration by an accredited laboratory.
- The acoustic sensitivity of the SLM should be tested with a portable acoustic calibrator before and after each sampling session.
- Samples of 30 min to 24 hours in duration and sufficient for statistical analysis should be taken with the use of portable SLM's capable of logging data continuously over the time period. Samples representative of the day- and night-time acoustic environment should be taken.
- The following acoustic indices should be recorded and reported: $L_{Aeq}(T)$, statistical noise level L_{A90} , L_{AFmin} and L_{AFmax} , octave band or 3rd octave band frequency spectra.
- The SLM should be located approximately 1.5 m above the ground and no closer than 3 m to any reflecting surface.
- Efforts should be made to ensure that measurements are not affected by the residual noise and extraneous influences, e.g. wind, electrical interference and any other non-acoustic interference, and that the instrument is operated under the conditions specified by the manufacturer. It is good practice to avoid conducting measurements when the wind speed is more than 5 m/s, while it is raining or when the ground is wet.
- A detailed log and record should be kept. Records should include site details, weather conditions during sampling and observations made regarding the acoustic environment of each site.

9.1.4 BLASTING VIBRATIONS MONITORING

- Disturbance monitoring is essential and should be carried out from the first blast using industry specific seismographs, which are equipped with a triaxial geophone and a separate microphone. This allows simultaneous measurement of ground vibrations and air blast.
- Seismographs should be positioned at sensitive or potentially sensitive locations. Seismographs should be set up on a permanent basis at pre-determined locations around the pits. These locations should be finalised and the stations positioned before the first blast is set off. Typically the buildings closest to the mining operations would be used to position the stations. This is based on the fact that the disturbance levels typically decrease with increase in distance. Any structures further away from the pits than the seismograph monitoring station would therefore experience lower levels of disturbance than those registered at the closest station.
- The ground vibration and airblast levels measured must be compared to the blast design and modelling results as well as to recognised and accepted industry standards to ensure compliance (see Appendix 2 for a summary of these). Use the seismograph information to check that the disturbance levels are compliant. If not the blast designs should be reviewed and changes made to the design to bring the levels down.
- Keep accurate and comprehensive blast records. All of the blast parameters as well as the timing and sequencing used to delay the blast should be recorded, as the individual seismograph measurements made need to be linked to the blasts. The blast information can be referenced and used to assist with future blast designs.

9.1.5 BIODIVERSITY MONITORING

The biodiversity monitoring will include the following:

- Monitor the health and control the loss of large *Aloe Zebrina* specimens, with input from a botanist.
- Monitor any unnecessary collateral damage as a result of construction vehicles.
- Monitoring and ensuring that large protected trees in the active area are retained. Monitor the health of these species, with input from a botanist.
- Regular inspection of the TSF and ensuring that mature seed of important local tree species are dispersed down the slopes of the old TSF as well as in the containers there.

9.1.6 SOIL MANAGEMENT MONITORING

Regular inspections of soil stockpiles and rehabilitated areas will be undertaken to ensure that the soil conservation procedure is being implemented.

9.1.7 MINERALISED WASTE FACILITIES

The following issues will, where relevant, be monitored on a quarterly basis and reported as required by relevant permits and authorisations issued to Trigon by the authorities:

- Slope stability, integrity of walls and liner in the TSF, presence of seepage, capacity of dirty water system, and functioning of drains.
- The volume of mineralised waste generated as well as the disposal area, height and footprint of mineralised waste disposal/storage facilities will be monitored and recorded as required. The results will be reported bi-annually.

9.1.8 NON-MINERALISED SOLID AND LIQUID WASTE

Weekly inspections of non-mineralised waste handling and management facilities will be undertaken to ensure that the waste management procedures are being implemented. The volume and type of non-mineralised waste, and the disposal destination, will be monitored and recorded as required. The results will be reported bi-annually.

9.2 AUDITING COMPLIANCE OF THE EMP

The commitments contained in this EMP will, once an environmental clearance has been obtained, be Trigon's contractual agreement with the Namibian authorities for sound environmental management. All employees, contractors and sub-contractors and any visitors to site will be expected to comply with the commitments contained herein.

9.2.1 AUDITS AND INSPECTIONS

The Environmental Manager / Officer will conduct internal management audits against the commitments in the EMP. During the 'construction phase' (i.e. site clearing, etc.), these audits will be conducted every month. In the operational phase, these audits will be conducted on a quarterly basis. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

In addition, an independent professional will conduct an EMP performance assessment at least once a year for the Bi-Annual Report. The mine's compliance with the provisions of the EMP and the adequacy of the EMP relative to the on-site activities will be assessed in this report.

The Environmental Manager / Officer will furthermore conduct daily inspections during 'construction' and weekly inspections during mining operations.

9.2.2 SUBMISSION OF INFORMATION

As a minimum, the following documents will be submitted to the relevant authorities on an ongoing basis:

- The bi-annual report required by the MET will be submitted every six months; and

- Other monitoring reports will be provided to the relevant authorities as per the permit requirements and other agreements.

APPENDIX A: MINE CLOSURE FRAMEWORK

1. Introduction

The aim of this Mine Closure Framework (MCF) is to present Trigon's commitment and approach towards closure of all aspects relating to the mine's operations. Ultimately it provides the basis for developing the Mine Closure Plan in conjunction with:

- Applicable legislation and relevant guidelines;
- All stakeholders; and
- Best Practice.

This document will therefore be a living document to be reviewed and updated when applicable and will form the basis of the Mine Closure Plan.

2. Approach

The *Namibian Mine Closure Framework* specifies the following content for this MCF:

- "Key objectives (for instance housing, community integration, future use of disturbed areas);
- Main closure aspects and associated components;
- Closure risk analysis;
- Stakeholder expectations;
- Evaluation of alternatives; and
- Identification of preferred alternatives.

Trigon intends to follow the above mentioned guidance in developing its Mine Closure Plan which will be a dynamic process that is integrated with life-of-mine planning to ensure a seamless transition from the operational to the decommissioning phases in the project life cycle. Regular risk and opportunity assessment will be undertaken to ensure a consistent approach to the identification and management of issues associated with mine closure.

Successful mine completion is achieved with final lease relinquishment, the key to which is early establishment and agreement amongst all parties concerned, on attainable closure criteria. The Mine Closure Plan which is central to this process evolves in complexity throughout the life of the mine. There will always be a level of residual risk or uncertainty throughout the process and this requires on-going assessment and management. All closure planning will therefore be risk-based and consider environmental, social, economic and regulatory risks.

3. Legislation

Guidance relating to mine closure is provided in the *Namibian Mine Closure Framework* developed by the Namibian Chamber of Mines in November 2008. This document outlines the Namibian regulatory setting in some detail, with reference to the following pieces of legislation:

- Minerals Policy of Namibia, 2002;
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation, 1994;
- Policy for Prospecting and Mining in Protected Areas and National Monuments, 1999;
- General Environmental Assessment Guidelines for Mining (Onshore and Off-shore) Sector of Namibia, 2000;
- Policy for the Conservation of Biotic Diversity and Habitat Protection, 1994;
- The Minerals (Prospecting & Mining) Act, No 33 of 1992;
- The Environmental Management Act, 7 of 2007;
- Water Act, 54 of 1956;
- The Atmospheric Pollution Prevention Ordinance, 11 of 1976; and
- Labour Act No. 6 of 1992.

Trigon will take into account the requirements of the above mentioned legislation and will implement the relevant requirements when developing the Mine Closure Plan.

4. Mine closure objectives

The Kombat Mine closure planning process will be guided by the following objectives that are endorsed by the Namibian Chamber of Mines (2008):

- To enable all stakeholders to have their interests considered during the mine closure process;
- To ensure the process of closure occurs in an orderly, cost-effective and timely manner;
- To ensure the cost of closure is adequately represented in company accounts and that the community is not left with a liability;
- To ensure there is clear accountability and adequate resources for implementation of the closure plan;
- To establish a set of indicators which demonstrate the successful completion of the closure process; and
- To reach a point where the company has met agreed completion criteria to the satisfaction of the responsible Government regulator.

It must however be highlighted that the proposed open pit mining and processing (and other associated) activities will most likely be followed by future underground mining and processing by Trigon. The LOM will therefore likely extend beyond the LOM relating to the proposed open pit mining activities. The MCP should therefore be developed in stages to take, firstly the open pit mining, and then the underground mining activities into consideration. However, progressive rehabilitation of the open pit (and relevant associated activities) must be planned for by Trigon at the end of the proposed project (i.e. open pit mining activities). There might be an “interim closure” before the underground activities commence, and Trigon needs to plan for this as part of the closure planning.

Ultimately it will be necessary for Trigon to demonstrate that closure of the Kombat Mine is socially, technically, and economically feasible without incurring long term liabilities for the government of Namibia. In addition to the above, Trigon also acknowledges the mine closure objectives as specified in the *Namibian Mine Closure Framework*:

- Prepare for changes in employment conditions at closure (negative social effects on people dependent on mine);
- Understand closure risks and prepare to mitigate impacts on associated communities and dependent businesses;
- Protect public health and safety and the environment by using safe and responsible closure practices;
- Reduce or eliminate adverse environmental effects once the mine ceases operations;
- Establish conditions which are consistent with the predetermined end use objectives; and
- Reduce the need for long-term monitoring and maintenance by establishing effective physical, chemical and ecological stability of disturbed areas.

5. Key closure objectives

The Mine Closure Framework is based on addressing the following key closure objectives (These objectives relate to the final closure of the Kombat Mine. The Mine Closure Plan (MCP) must however cater for progressive rehabilitation at the end of the LOM of the open pit mining activities, taking the relevant objectives into account):

- Disturbed areas other than those comprising the mineralised waste facilities will be returned to as close to the natural habitat as practicable;
- The possibility of backfilling the surface pits with waste rock to be considered as part of the development of the mine closure plan. Trigon would most probably not close the pits within the next couple of years (i.e. after the LoM of the two pits) as the depth of these pits mainly depends on economics (Copper price, costs, etc.);
- Progressive/on-going rehabilitation to be undertaken throughout the LOM so as to limit the remaining rehabilitation efforts required at closure (i.e. progressive re-vegetation of side walls of the proposed new TSF to be undertaken as far as possible);
- Disturbed areas other than those comprising the proposed new (and historic) TSFs and remaining waste rock dump will be returned to as close to their original state as is practical;
- Permanent visible features such as the TSF and WRD(s) and related environmental bunds will be left in a form that blends with the surrounds;
- Contamination beyond the mine site by wind, surface run-off or groundwater movement will be prevented through appropriate erosion resistant covers, containment bunds and drainage to the open pit;
- The processing plant, crusher and conveyors will all be dismantled, and salvageable elements will be de-contaminated and sold. The remainder of the processing plant including steelwork, concrete, liners, brickwork etc. will be dismantled or broken up and disposed of at a site approved by the relevant authorities;
- Linear infrastructure comprising roads, pipelines, conveyors and related components will be removed and the disturbed land rehabilitated to blend with the surrounding natural environment;
- Topsoil will be replaced on all roads and re-contoured infrastructure sites; and
- Socio-economic impacts (including the loss of employment) will be minimised through careful planning and preparation for closure.

The above principles and concepts will be refined as part of ongoing detailed closure planning and costing during the life of mine.

6. Closure needs

Trigon has developed a number of closure needs, based the closure objective as described in Section 4. These include the following:

- Remove all infrastructure;
- Re-establish a landscape that can over time regenerate sustainable endemic vegetation communities;
- Ensure that an ecologically functioning (Fauna & flora) environment is left behind;
- Effectively decontaminate and remediate all areas affected by the mine; and
- Socio-economic factors (employees, suppliers, community).

In addition to the above, the government and community needs will also be taken into consideration but there is currently limited information available on this. However, the objective of future stakeholder engagement is, amongst others, to understand these stakeholders' mine closure needs.

7. Stakeholder consultation

Trigon acknowledges the importance of both the positive and negative effects of the mine's activities on key stakeholders, including employees, local suppliers, communities, government and interested non-government organisations. The development of a successful Mine Closure Plan will require the involvement of all affected parties.

Understanding the concerns and obtaining the input from stakeholders will be an important part of the process while Trigon develops the Mine Closure Plan and during its periodic review throughout the LOM. Trigon believes the benefits of a successful stakeholder engagement process include:

- Improved planning decisions;
- Improved cooperation with government;
- Better closure decisions;
- Good corporate governance; and
- Improved community receptiveness.

Trigon expects to take the following steps to ensure quality stakeholder engagement:

Stakeholder identification

Stakeholders include employees, management and shareholders of the company, as well as external parties such as communities (for instance, local business and landholders (specifically in the town of Kombat), NGOs, and government (ministries, departments, local government and parastatals).

During the identification of the stakeholders for mine closure, Trigon will recognise the difference between those directly affected by mine closure such as employees and those that have an interest in the process of mine closure, and will address the issues of each different group in the Mine Closure Plan.

Effective consultation and working with communities

Trigon will consult and provide feedback to stakeholders and interested parties and intends to follow a two-way communication approach. Additionally, Trigon's intention will be to manage and guide expectations of affected stakeholders and to mitigate, as best as possible, negative (economic, social and bio-physical) impacts and to enhance positive impacts for the establishment of the mine project.

Targeted communication strategy

Trigon aims to develop a communication strategy ensuring that the needs of stakeholder groups and interested parties are adequately addressed and reflected in the Mine Closure Plan.

Trigon understands that the different stakeholder groups, having different concerns and needs, are addressed in the appropriate manner, e.g. employees and suppliers will need to find other business opportunities, and the local communities will like to see the area adequately restored.

Adequate human and financial resources

Trigon's intention is that all stakeholders have the necessary information to cooperate effectively in the closure process. To achieve this goal Trigon intends to ensure that adequate human and financial resources are allocated from the start of the life of mine to plan for mine closure.

8. Alternatives

Different closure alternatives still need to be identified and further investigated as part of the closure planning process.

9. Closure criteria

Completion criteria will be used to facilitate the fulfilment of mine closure objectives and the closure needs, as follows:

- Specific to the Kombat mine site reflecting its set of environmental, social and economic circumstances;
- The basis on which successful reclamation is determined, and should be developed in consultation with stakeholders. This ensures that there is broad agreement on both the end land use objectives and the basis for measuring the achievement of that objective;
- Flexible enough to adapt to changing circumstances without compromising the agreed end objective. This provides certainty of process and outcome (relinquishment of tenement when the conditions have been met);

- Progressive rehabilitation – planning for closure of the open pit mining (and associated) activities first;
- Completion criteria are periodically reviewed and modified in light of improved knowledge or changed circumstance;
- The closure criteria will be developed and included in the Mine Closure Plan and will take, amongst others, the following commitments into consideration:
 - The removal of all infrastructure, plant and equipment;
 - The engineering of all remnant mine landforms such that they are stable, non-polluting and blend into the surrounding landscape as far as possible;
 - The rehabilitation of ecology/land use (e.g. ecosystem functionality);
 - The implementation of an effective community exit strategy;
 - Establishing an accurate closure cost estimate such that adequate closure provision can be made; and
 - Post closure monitoring and maintenance.

10. Risk assessment

All closure planning is risk-based and considers environmental, social, economic and regulatory risks.

A formal closure risk assessment is required to fully evaluate the potential closure risks and possible mitigation/control strategies.

The basis of this risk assessment process is the identification of Environmental Aspects and Impacts associated with mine closure. This process was initiated through the EIA process conducted. Moreover, this will be further refined through the mine's closure planning process as more detail becomes available.

The risk assessment shall take the following categories into consideration:

- Mined area;
- Infrastructure;
- Processing Plant and Logistical support;
- Mineralised waste facilities; and
- Stakeholders (Employees, contractors/service providers, Government, local community, NGOs).

Risk assessment process

The following steps will be undertaken when conducting the risk assessment:

- 1) Under each category (as described above) establish the "risk title" which describes the specific risk.
- 2) Determine the causes/indicators/triggers for each risk title.
- 3) Describe the potential impacts/consequences for each of the above
- 4) Establish which controls are already in place

- 5) Provide a likelihood and a risk rating (consequence) for each potential impact with reference to the descriptors in Table 1 and Table 2.
- 6) Determine the risk level based on the matrix presented in Table 3.
- 7) Provide risk management measures during operations and closure.

TABLE 1: LIKELIHOOD DESCRIPTORS

LIKELIHOOD DESCRIPTORS		
	Description	Indicative frequency
Almost Certain:	The event will occur on an annual basis	Once a year or more frequently
Likely:	The event has occurred several times or more in your career	Once every three years
Possible:	The event might occur once in your career	Once every ten years
Unlikely:	The event does occur somewhere from time to time	Once every thirty years
Rare:	Heard of something like the event occurring elsewhere	Once every 100 years

TABLE 2: CONSEQUENCE DESCRIPTORS (CONCEPTUAL)

CONSEQUENCE DESCRIPTORS						
Severity level	Consequence Types					
	Financial (Revenue/Costs)	Health and safety	Natural environment	Social/cultural Heritage	Community/govt./reputation/media	Legal
Catastrophic:	>\$100M	Multiple fatalities, or significant irreversible effects to >50 persons	Very serious, long-term environmental impairment of ecosystem functions			Significant prosecution and fines Very serious litigation including class action
Major:	\$20M –\$100M	Single fatality and/or severe irreversible disability		On-going serious social issues. Significant damage to structures/items of cultural significance	Serious public or media outcry (international)	Major breach of regulation Major litigation
Moderate:	\$1M - \$20M	Moderate irreversible disability or impairment (>30%) to one or more persons	Serious medium term environmental effects	On-going social issues. Permanent damage to items of cultural significance	Significant adverse national media/public/NGO attention	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fine possible
Minor:	\$100, 000- \$1M	Objective but reversible disability requiring hospitalization	Moderate, short-term effects but not affecting ecosystem functions	On-going social issues. Permanent damage to items of cultural significance	Attention from media and/or heightened concern by local community. Criticism by NGOs	Minor legal issues, non-compliances and breaches or regulations
Insignificant:	<\$100,000	No medical treatment required	Minor effects on biological or physical environment	Minor medium-term social impacts on local population. Mostly repairable	Minor Adverse local public or media attention or complaints	

TABLE 3: RISK CATEGORIES (CONCEPTUAL)

RISK CATEGORIES					
LIKELIHOOD	CONSEQUENCES				
	1	2	3	4	5
	Insignificant	Minor	Moderate	Major	Catastrophic
5 Almost Certain:	<u>M</u>	<u>H</u>	<u>H</u>	<u>VH</u>	<u>VH</u>
4 Likely:	<u>M</u>	<u>M</u>	<u>H</u>	<u>H</u>	<u>VH</u>
3 Possible:	<u>L</u>	<u>M</u>	<u>H</u>	<u>H</u>	<u>H</u>
2 Unlikely:	<u>L</u>	<u>L</u>	<u>M</u>	<u>M</u>	<u>H</u>
1 Rare:	<u>L</u>	<u>L</u>	<u>M</u>	<u>M</u>	<u>H</u>

11. Closure planning

The end use of the mine site has still to be determined through negotiation with stakeholders (including relevant Governmental Departments, NGOs and I&APs).

At this stage in planning, the closure strategy is to remove all buildings and structures from the project area and rehabilitate the sites, disposing of all chemicals and contaminated material in an environmentally-safe manner. All physical landforms/features resulting from mining operations are to be engineered in such a manner that their long-term landforms are stable, safe and re-vegetated. The water quality of any seepage or run-off will be such that it meets baseline water standards.

12. Closure Plan

Trigon acknowledges the requirements for the Closure Plan content specified in the *Namibian Mine Closure Framework* and the Mine Closure Plan will therefore include:

- Social Plan (employees and communities);
- Progressive rehabilitation plan;
- Decommissioning plan;
- Final rehabilitation plan;
- Monitoring plan; and
- Detailed closure costing.