


ENVIRONMENTAL MANAGEMENT PROGRAMME(EMP)

FOR

**THE MINING RIGHT APPLICATION FOR THE PROPOSED MINING DEVELOPMENT FOR DIAMOND
KIMBERLITE (DK) AND DIAMOND GENERAL (DG)**

DMRE ref no: FS 30/5/1/2/2/10064MR

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ABBREVIATIONS; ACRONYMS AND DEFINITIONS

Activity-any action needed for the design, construction and completion of a project.

Alien species - a species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities.

Alternative- in relation to the proposed activity means a different way of meeting the general purpose and requirements of the activity.

CEMP – Construction Environmental Management Plan

Construction Activity - any action taken by the Contractor their sub-contractors, suppliers or personnel during the construction process.

Contaminated water – means water contaminated by the contractors' activities, e.g. concrete water and runoff from plant / personnel wash areas.

Department of Agriculture and Rural Development the authority responsible for environment authorisation of proposed development and for input into and approval of the final Environmental Management Plan (EMP)

Environment –The surrounding in which humans exist, and which comprise:

- a) The land , water and atmosphere of the earth
- b) Micro-organisms, plant and animal life
- c) Any part or combination of a) and b) and the interrelationships among and between them; and
- d) The physical, chemical aesthetic and cultural properties and conditions of the foregoing that can influence human health and well being

Environmental Audit – a systematic, documented, regular and objective evaluation to see how well an organisation or facility is operating in terms of the EMP and is complying with statutory requirements and the organisation's environmental policy.

Environmental Authorisation (EA) -the formal written document indicating the granting or refusal of authorisation for a proposed development, issued by the relevant approving authority.

Environmental Control Officer (ECO) – an independent person, appointed by the Proponent/Implementing Agent during the construction phase of the project, who shall be responsible for undertaking site inspections to monitor and report on compliance with the EMP.



Environmental Impact- any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects

Environmental Management Plan (EMP)-this document is recognised as the tool that can provide the assurance that the project proponent has made suitable provision for mitigation. The EMP is the document that provides a description of the methods and procedures for mitigating and monitoring impacts. It also contains environmental objectives and targets which the proponent needs to achieve in order to reduce or eliminate negative impacts.

Environmental Monitoring (EM) - the person to be appointed by the Consulting Engineers to oversee the design and construction phases of Project and to ensure that all environmental specifications and EMP obligations are met during these phases. The Environmental Monitor will be responsible for the monitoring, reviewing and verifying of compliance with the EMP by the Contractor.

Environmental Education Officer (EEO) - Persons to be appointed by the Contractor who will be on site and be responsible for daily inspections at the construction area and camp site.

Fauna- All living biological creatures, usually capable of motion, including insects and predominantly of protein based consistency.

Fence- a physical barrier in the form of posts and barbed wire or any other concrete construction, ("palisade"- type fencing included, constructed with the purpose of keeping humans and animals within or out of defined boundaries.

Fine - A monetary penalty against the Contractor by the PM as per request from the ECO.

Flood line – The line or mark to which a flood could rise 50 (1:50 year flood line), or 100(1:100 year flood line) years.

Flora –All living plants, grasses, shrubs, trees, etc., usually incapable of easy motion and capable of photosynthesis.

Groundwater –The water that fills the natural openings present in rock or unconsolidated sands.

Hazardous wastes- waste that because of their chemical reactivity, toxic, explosive, corrosive radioactive or other characteristics, cause danger, or are likely to cause danger, to health or the environment.

Heritage – the sum total of sites of geological, zoological, botanical and historical importance, national monuments, historic building and structures, works of art literature and music, oral traditions and museum collections and their documentation which provides the basis for a shared culture and creativity in the arts.

Heritage Resources – there are various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources i.e. places or object of cultural significance.

Induction training- Training provided to all new employees prior to them being allowed on site.

Interested and Affected Party (I&AP) – Refers to any person, or group of persons, concerned with, or affected by, an activity and its consequences. These include the authorities, local communities, investors, work force, customers, and consumers, environmental interest groups, and the general public (after the EIA Regulations of September 1997 and Guideline Document: EIA Regulations of 2014)

Land Use– is characterised by the arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it. Definition of land use in this way establishes a direct link between land cover and the actions of people in their environment.

MSDSs - Material Safety Data Sheets

Method Statement– A written submission by the Contractor in response to the Specification/EMP or a request by the Resident Engineer, setting out the plant, material, labour and method of the Contractor proposes using to carry out an activity, identified by the relevant specification or the Resident Engineer is enabled to assess whether the Contractor’s proposal is in accordance with the EMP and associated specifications.

Mitigate – The implementation of practical measure to reduce adverse impacts, or to enhance beneficial impacts, of an action.

MPRDA – The Mineral and Petroleum Resource Development Act (Act No.28 of 2002)

NEMA – National Environmental Management Act (Act No.107 of 1998)

No-Go Area – Areas where construction activities are referred to no go Areas.

Noncompliance- Failure to comply with requirements of the EMP

Non-renewable resources – means the resources that have a finite stock and either cannot be reproduced once they are used or lost, or cannot be reproduced within a time span relevant to present or future generations.

NWA – National Water Act (Act no.36 of 1998)

Pollution – Any change to the environment caused by(i)substance; (ii) radioactive or other waves; or (iii) noise, odours, dust, or heat emitted from any activity, including the storage or treatment of waste or substance, construction and the provision of service, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future (after National Environment Management Act, No.107 of 1998).

PPE – Personal Protective Equipment

Project – the planning, design, construction, operation and maintenance, and eventual decommissioning of the development.

RE – Resident Engineer

Rehabilitation– To re-establish or restore to a healthy sustainable capacity or state.

SAHRA– South Africa Heritage Resource Agency

Solid waste- means all solid waste, including construction debtors, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Wetland –A wetland is land which is transitional between terrestrial and aquatic system where table is usually at or near the surface, or the land is periodically covered with shallow water and which in normal circumstances supported vegetation typically adapted to life in saturated soil (National Water Act, No.36 of 1998)

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1.PROJECT INFORMATION

1.1. Background

INVEST IN PROPERTY 126 (PTY)LTD propose to apply for mining right in a small town Boshof in Free State, South Africa. The area cover is approximately 3389 ha. The mining right application is for a proposed mining development for Diamond kimberlite (DK) and Diamond General (DG). The proposed development is located on Farm Viljoenshof 1655, located 27.9km km north east of Kimberly,120 km west of Bloemfontein and 13 km east of Boshof town. The applicant Mr Verdi Scholtermeyer is the permit holder for prospecting mining right permit granted by the Department of Mineral Resource and Energy (DMRE) in terms of Minerals and Petroleum Resource Development Act (Act 28 of 2002).

The project area is located within the Loxtonsdal kimberlite cluster which hosts two historical diamond mines. All known kimberlites in this cluster are of the Group II variety. Prospective work programs were undertaken at the proposed development mainly to investigate, determine and confirm the presence of diamond Kimberly on Farm Viljoenshof 1655. Non-invasive methods were explored to locate minerals using geophysical survey (magnetic and electromagnetic) soil sampling, google earth satellite images and exiting geological studies previously carried out in farm Viljoenshof 1655. The geological studies undertaken at the propose development area confirms presence of a number of additional anomalies. Mineral chemistry of kimberlitic indicator minerals (pyropic garnets, Cr-spinels and clinopyroxenes) verified high diamond potential of several targets. Moreover, geochemistry of kimberlites is also indicative of high interest mantle source.

The proposed overall activity will begin and be implemented in a pilot mining phase for a duration period of one (1) year. A contractor with readily available plants and earthmoving equipment will be responsible for the implementation of pilot phase. This phase is necessary given that the prospecting work program was only limited to non-invasive approach. Additionally, invasive approach such as trenching/pitting and drilling was not conducted as a result of farm property owner restriction to access the property and proscription use of earthmoving plants, machinery and construction vehicles for related prospecting activities. The pilot stage will encapsulate further study of the diamond ore. The primary objective of the pilot mining phase is:

- Open complete area of the kimberlite body(ies) and cut first two benches into kimberlite;
- Process different kimberlite type separately and determine the grades and diamond quality variation;
- Carry out metallurgical studies of the ore for final design of the plant;
- During this stage geophysical survey and diamond core drilling will be implemented to study ore bodies morphology with depth;
- The outcome of geophysical survey and diamond core drilling will be implemented to study ore bodies morphology to be used for long term underground mining method to be used.

The open cast method for mining have been considered as a preferred method for minerals extraction. The open cast method will entail the trenching to the depth of two (2) benches (i.e.12 to 20 m) however, this is dependent on the hosting rock competence and stability. The pilot phase is envisaged to be disassociated with excessive blasting given that the hosting rock is black and grey Ecca shale, which is quite brittle. However, soft blasting will be applied where necessary in particular for cutting into kimberlites. The proposed mine property is characterised by game farming, livestock farming and related agricultural crop farming at a small scale. This necessitates the use of soft blasting to avoid and reduce impact on game farm with noise and flying rocks fragments.

1.2. Introduction

An EMP can be defined as a plan or programme that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored. The EMP will address the environmental impacts during the design, construction and operational phases of a Project. Due regard must be given to environmental protection during the entire Project. To achieve this, a number of environmental specifications/recommendations are made. These are aimed at ensuring that the project proponent maintains adequate control over the Project in order to:

- Minimise the extent of impact during the life of the Project;
- Ensure appropriate restoration of areas affected by the Project; and
- Prevent long term environmental degradation.

This EMP will form part of the EIAR to be submitted for environmental authorisation. An EMP is a stand-alone document that is used to guide and regulate environmental performance through all stages of development. The EMP forms part of the approving authorities decision making tools and upon authorisation become legally binding on the proponent and anyone acting on the proponent's behalf during construction and operational activities. The conditions of the Environmental Authorisation relevant to the EMP must be included in the EMP document. It should be noted that this EMP is a living document and may need to be updated on a regular basis, either as directed by the Environmental Control Officer or by the Environmental Authorities. The EMP's main objective is to ensure best practices are followed with optimal environmental protection being sought. Therefore, this document seeks to bridge the gap between the assessment and the implementation of the project during the construction phase. In doing so, this document draws the Contractor's attention to the requirements of the monitoring, auditing and corrective actions required during implementation.

The key requirements of an EMPR, according to provisions in the Act and the Regulations, are:

1. baseline information for the affected environment;
2. the environmental objectives, both for operation and closure;
3. a quantification of environmental impacts;
4. an implementation programme that includes:
 - technological options;
 - management systems;
 - action plans with time schedules;
 - emergency response plans;
 - monitoring and evaluation;
 - an environmental awareness plan aimed at informing employees; and
 - Pollution/waste prevention, reduction and remediation.

The compilation of a detailed EMPR would be required to at least fulfil the above requirements. The EIA process required to inform the development of the EMPR, in terms of the MPRDA, can be undertaken in parallel with the EIA process required for the proposed Development project in terms of NEMA (application for authorisation to the Limpopo Department of Economic Development, Environment and Tourism, as well as the application for a waste management licence to the Department of Environmental Affairs). The parallel process does, however, need to fulfil the requirements of both Acts.

1.3. Project description

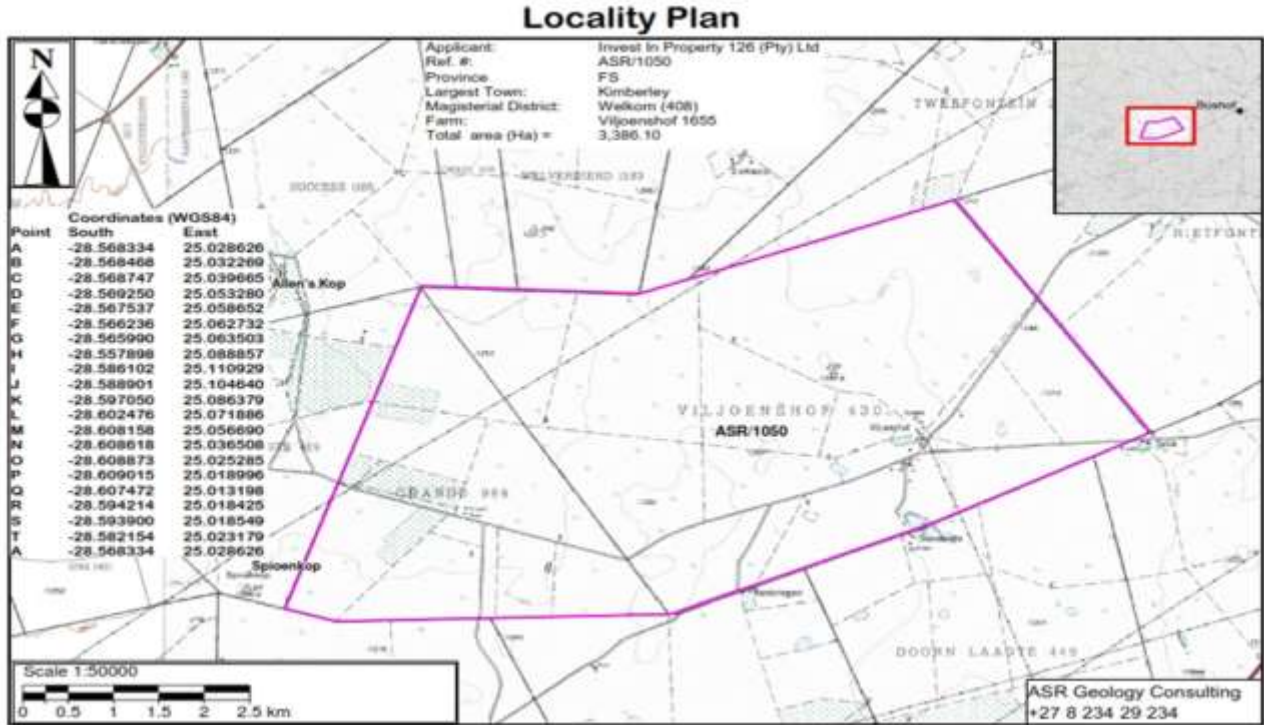
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1.4. Project Location

The project area is situated in Free State Province in a small town Boshof. It falls within the Tokologo Local Municipality of the Lejweleputswa District Municipality; and is situated approximately 27,9km north-east of the Kimberly and 120km west of Bloemfontein.



1.5 Details of the EAP

Table 1: Details of the EAP

Environmental Assessment Practitioner (EAP)			
Name of EAP:	Mr Macebele T		
Consulting Firm	Biomental Services		
Physical Address:	10 jenny street De Aar 7000		
Postal Code:	7000	Cell:	060 5702 461/068 321 4288
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E-mail:	info@biomental.co.za tiyiselani@biomental.co.za mahori@biomental.co.za		
Website:	www.biomental.co.za		
Experience	The EAP, Mr. Macebele Tiyiselani have vast experience in environmental management field and have been involved in number of projects in the public		

	and private sector such as renewable energy projects, mining and construction. Tiyiselani have experience in drafting EMPs, application for Basic assessment, permits & licensing, prospecting mining right and mining rights.
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Environmental Assessment Practitioner (EAP)			
Name of EAP:	Mr Mahori Nhlawulo		
Consulting Firm	Biomental Services		
Physical Address:	10 jenny street De Aar 7000		
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Website:	www.biomental.co.za		
Experience	<p>Mr Mahori Nhlawulo has completed his professional registration in terms of section 20(3) (b) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003) in the field of practice Environmental Sciences (Registration number 125490).</p> <p>He is registered in accordance with the prescribed criteria of Regulation 15(1) of the section 24H Registration Authority Regulations (regulation No.849, Gazette No. 40154 of the National Environmental Management Act (NEMA) Act No. 107 of 1998) as amended) EAP (Registration No. 2019/1026)</p> <p>He obtained his Bachelor of Environmental Sciences in 2016 and Bachelor of Environmental Sciences Honours Degree in 2017 at the University of Venda.</p> <p>Mr Mahori Nhlawulo is an Environmental Assessment Practitioner and has been involved in the compilation, coordination and management of Basic Assessment Reports, Environmental Impact Assessments, Environmental Management Programmes, Waste Licence Applications, Water Use Licence</p>		

	Applications, Mining Permits Application and Baseline Biodiversity Surveys for numerous clients.
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1.6 Objectives of EMP

This EMP is based on the principles of the NEMA and this includes the following:

- To avoid, minimise or correct the disturbance of the ecosystem and loss of biodiversity;
- To avoid, minimise or correct pollution and degradation of the environment;
- To avoid or minimise waste and to re-use or re-cycle waste where possible and to dispose of waste in a responsible manner;
- To apply a risk adverse and cautious approach; and
- To anticipate and to prevent negative impacts on the environment and on people’s environmental rights. Where impacts cannot be prevented, such impacts must be minimised and remedied.
- To integrate plan for monitoring; assessing and controlling potential impacts
- To be a “cradle to grave” document. That is, the document is considered to be a live document that can be reviewed and updated over time to ensure optimal environmental management across the life of the development.

This document serves to outline how the project will be managed through its life cycle and in doing so, designed to improve positive and mitigate environmental impacts associated with this project. The scope of this EMP therefore sets conditions for the implementation of the environmental management component of the project for all contractor(s) executing the project. The EMP also provides an institutional structure for the roles, responsibilities and reporting lines, impact identification and mitigation of potential negative environmental impacts.

The EMP provides detailed strategies to be implemented to ensure management of key performance areas are achieved, namely: Water Management, Waste Usage and Disposal, Storm Water Management, Noise Management, Dust Management, Pollution Prevention, Recycling and Waste Management, Bio-diversity, Transport/ Traffic, Community Awareness and Safety; Environmental Management and others.

2. ROLES AND RESPONSIBILITIES

The implementation of this EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during all the phases of the project.



Chart 1. Implementing structure and project management team

2.1. Department of Mineral Resources and Department of Economics, Small Business Development and Environmental Affairs

- The Department of Mineral Resources (DMRE) and Department of Economics, Small Business Development and Environmental Affairs are the designated authorities responsible for authorizing this EMP. The Competent Authorities overall responsibility for ensuring that Invest In Property 126 (Pty) Ltd adheres to and implement the conditions of its environmental authorization as well as this EMP. The competent authority shall also be responsible for approving any amendments that may be required to the EMP and it may also perform random site inspections to check compliance with the EMP.

2.2. INVEST IN PROPERTY 126 (PTY)LTD

The proponent is responsible for the implementation of the EMP and the financial cost of all environmental control measures. Invest In Property 126 (Pty) Ltd must ensure that any person acting on their behalf complies with the conditions/specifications contained in this EMP. Invest In Property 126 (Pty) Ltd is also responsible for the appointment of the Engineer, Contractor and Environmental Control Officer (ECO) and shall address any site problems pertaining to the environment at the request of the Engineer and/or the ECO.

2.2. MINE MANAGER

The mine manager shall oversee the planning, design, and construction, operational and decommissioning phases of the project. The Manager shall designate a Mining Engineer or Engineer's Representative (referred to as the ME) to act as the implementing agents. The Engineers shall work in conjunction with ECO and SHE Officer to address any site problems pertaining to the environment.

2.3. CONTRACTOR

The Contractor shall have the following responsibilities:

- To implement all provisions of the EMP. If the Contractor encounters difficulties with specifications, he must discuss alternative approaches with the RE and/or the ECO and Health and Safety Officer prior to proceeding.
- To ensure that all staff are familiar with the EMP.
- To monitor and verify that the environmental impacts are kept to a minimum.
- To make personnel aware of environmental problems and ensure they show adequate consideration of the environmental aspects of the project.
- To prepare the required Method Statements
- To report any incidents of non-compliance with the EMP to the RE and the ECO.
- To rehabilitate any sensitive environments damaged due to the Contractor's negligence. This shall be done in accordance with the RE's and ECO's specifications.

Failure to comply with the EMP may result in fines and reported non-compliance may lead to the suspension of work or termination of the contract by the RE.

2.4. MINING ENGINEER (ME)

The Mining Engineer would act as an on-site implementing agent and has the responsibility to ensure that Invest In Property 126 (Pty) Ltd responsibilities are executed in compliance with the EMP. Any on-site decisions regarding environmental management are ultimately the responsibility of the ME. The ME shall assist the ECO where necessary and shall have the following responsibilities in terms of the implementation of this EMP:

Reviewing and approving the Contractor's Method Statements with input from the ECO where necessary.

- Monitoring and verifying that the EMP and Method Statements are adhered to at all times and taking action if specifications are not followed.
- Keeping a photographic record of construction activities on site.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary.
- Ordering the removal of person(s) and/or equipment not complying with the EMP specifications.
- Issuing fines for transgressions of site rules and penalties for contravention of the EMP.
- Delaying any construction activity if he/she believes the integrity of the environment has been or is likely to be seriously jeopardized.
- Providing input into the ECO's ongoing internal review of the EMP.
- The ME shall communicate environmental issues to the Environmental Officer.

2.5. ENVIRONMENTAL CONTROL OFFICER (ECO)

The Environmental Control Officer's (ECO) duties shall include, *inter alia*, the following:

- Ensuring the necessary environmental authorizations and permits, if any, has been obtained.
- Advising the Contractor and/or the ME on environmental issues within defined construction areas.
- Undertaking regular site visits to ensure compliance with the EMP and verifying that environmental impacts are kept to a minimum throughout the contract.
- Completing environmental checklists and or environmental audits during site visits.
- Keeping a photographic record of progress on site from an environmental perspective.

- Assisting the Contractor and/or the ME in finding environmentally acceptable solutions to construction problems.
- Recommending additional environmental protection measures should be necessary.
- Keeping a register of complaints and recording and dealing with any community issues or comments.
- Giving a report back on the environmental issues at site meetings.
- Ensuring that Invest In Property 126 (Pty) Ltd is informed of work progress on site.
- Reporting any incidents that may have caused damage to the environment or breaches of the EMP to the Competent Authority
- Preparing an environmental audit report at the conclusion of the construction phase.

The ECO shall communicate directly with the ME. Should problems arise on site that cannot be resolved between the ECO and the ME, the ECO shall take the matter up with the Engineer. If the Engineer does not respond the ECO shall report the non-conformance to the relevant Authority.

2.6. ENVIRONMENTAL OFFICER (EO)

The Contractor (s) shall appoint, at own cost, an Environmental Officer (EO) to ensure that the EMP is implemented and ensure that all environmental specifications and EMP requirements are met at all times. The EO shall be responsible for monitoring, reviewing and verifying the Contractor's compliance with the EMP. The EO's duties in this regard shall include, *inter alia*, the following:

- Monitoring and verifying that the EMP and conditions of Environmental Authorization are adhered to at all times and taking action if specifications are not followed.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Arrangement and maintenance of all traffic accommodation measures required for the duration of the contract.
- Assisting the ME and ECO in finding environmentally responsible solutions to problems.
- Inspecting the site and surrounding areas on a regular basis with regard to compliance with the EMP.
- Keeping accurate and detailed records of these inspections.
- Reporting any incidents of non-compliance to the ME and/or the ECO.

- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.

3.PROJECT ACTIVITIES AND POSSIBLE ENVIRONMENTAL IMPACTS

The impact management outcomes including management; identified impacts and risks which will be avoided, managed, and mitigated as identified through the Scoping and EIAR process will cover all the phases of development including:

- Planning and design
- Preconstruction activities
- Rehabilitation of the environment after construction
- Operation activities

Table 2: The risks and key issues identified during the scoping phase are tabulated below:

Aspect	Impact Description
Topography	
Change in the Project surface area due to site clearing activities for the preparation of construction of infrastructure.	The removal of vegetation and topsoil will change the surface of the Project area and will therefore change the topography.
Change to topography due to construction of surface infrastructure.	The construction of surface infrastructure will add features to the topography thereby changing it.
Changes to the topography due to open casting ,excavations ,blasting and development of infrastructure for mining.	The development of surface infrastructure will add features to the topography while drilling and blasting will create voids thus changing the topography.
Change in local topography due to the operation of surface infrastructure.	Operation of the stockpiles, waste rock dumps and the TSF will add to the surface and thereby change the topography of the Project area.
Visual	
Site clearing activities influencing the visual Environment.	The removal of topsoil and vegetation will have a negative visual impact on the receiving

	environment. Furthermore, the infrastructure (especially the TSF) will become noticeable to the surrounding receptors.
Construction of surface infrastructure influencing the visual environment.	The construction of the mine's surface infrastructure will have a negative visual impact on the receiving environment.
blasting and development of infrastructure and shafts for mining will Influence the visual aspects of the project area.	The drilling, blasting (generation of dust) and development of infrastructure and shafts for mining will have a negative visual impact on the receiving environment.
Adding material to the waste rock dumps, stockpiles and TSF.	Operation of the ore stockpile, waste rock dumps and TSF will have a negative visual impact on the receiving environment. This will be as a result of continuously adding material to these waste rock dumps and stockpiles.
Flora and Fauna	
Loss of Impacted Vegetation due to construction activities.	Mine construction activities will lead to the loss of impacted vegetation thus impacting the biodiversity value of the areas affected.
Loss of general biodiversity	The construction and operation of the mining infrastructure will lead to the potential loss of general biodiversity within the Project Area, thus decreasing the biodiversity value of the areas affected.
Loss of flora and fauna Species of Special Concern.	The construction and operation of the mining infrastructure will lead to the potential loss of flora and fauna Species of Special Concern (SCC).
Influx of alien invasive species.	Construction, operation and decommissioning activities may cause the uncontrolled influx of

	alien invasive species within and around the Project area
Surface Water	
Surface water run-off from mining activities.	Increased run-off due to large concrete terraces and roads and poor-quality run-off from mining activities could impact the surface water quality.
Impact on local road infrastructure and Access Road	
Effect on road infrastructure Effect of access roads into the proposed development roads	Increase traffic volume on the R64 Noise Dust Impacts on game animals
Soil	
Soil compaction and topsoil loss due to erosion	Activities during early works, construction and operational phase in the Project area could lead compaction of soils and soil erosion.
Impact of site rehabilitation on soil and land capability	During the decommissioning activities, impacts to soil resources may include compaction and contamination which may be significant only in the short term.
Air Quality	
Dust emissions effect on neighbouring farm properties	Movement of mining vehicles and its operational related plants will directly or indirectly induce dust emission Impacts on neighbouring farm
Social Impacts	
Construction phase and Operational Phases	Job creation during construction
	Multiplier effects on the local economy
	Economic empowerment of communities
	Skills transfer and development

	Community development induced by Local Economic Development (LED) and Corporate Social Initiatives (CSI) projects
	Economic displacement
	Disruption of movement patterns
	Construction-related health and safety impacts
	Visual/acoustic/vibration and air quality impacts
	Increase in spread of communicable diseases and social pathologies
	Conflict/competition between newcomers and incumbent population
	Increased pressure on local services/ resources
	Establishment and growth of informal settlements
	Opposition because of perceived negative impacts
	Job creation during operation
	Regional economic development
	Dependency on mine for sustaining local economy
	Operation-related health and safety impacts
Decommissioning phase	Impacts on the work force
	Impacts on the local community
	Impacts on the wider community
	Job creation

3.1 ENVIRONMENTAL MANAGEMENT PROGRAMME

Table 3: Environmental Management Programme

Project activities	Receiving environment	Objectives	Management and mitigation measures	Frequency	Legal requirements	Recommended action plan	Duration	Responsible person
Construction								
1.Site Clearing Removal of Topsoil and vegetation	Topography	<p>1.To minimise topographical change and disruption of surface water flow</p> <p>2.To minimise soil erosion and topsoil loss</p>	<ol style="list-style-type: none"> 1. Do controlled dumping at the tailings dump facility. 2. Stabilise the mine residue deposits. 3. Employ effective rehabilitation strategies to restore surface topography of tailings dumps and plant site. 4. Pick up all tailing material up to natural ground level. 5. Stabilise underground workings. 	Weekly	N/A	1. .Mine Plan		Environmental Manager/Environmental Control Officer/Mine Manager

			6. All temporary infrastructures will be demolished during closure					
	Aesthetic and Visual Impact	To minimise the negative visual impact caused by the removal of topsoil and vegetation	<ol style="list-style-type: none"> 1. Topsoil and vegetation should only be removed when and where necessary 2. Topsoil stockpiles should be vegetated and positioned to reduce visual disturbance where possible 3. During the construction of the mine infrastructure, consideration to the natural hues can be achieved by painting infrastructure with matt tones 	Weekly	N/A	<ol style="list-style-type: none"> 1. Mining Plan 2. Fire Control Plan 	MLS (Mine Life Span)	Environmental Manager/Environmental Control Officer /Mine manager

			<p>to help camouflage the infrastructure</p> <ol style="list-style-type: none"> 4. Construction activities and associated infrastructure to be shielded/concealed as far as possible. 5. Construction activities are to be limited to day light working hours 6. No construction crews are to be accommodated onsite after hours, except for a night watchman 7. Low level and frequency lighting are to be utilized wherever possible 8. Dust from Stockpile areas, roads and other activities must be managed by 					
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			<p>means of dust suppression to prevent excessive dust.</p> <p>9. Stockpiles should not exceed 15m in height.</p> <p>10. Rehabilitation of the area must be done as the mining is completed.</p> <p>11. The visual impact can be minimized by the creation of a visual barrier.</p> <p>12. The retention of as much existing vegetation as possible, specifically the existing mature trees in the area to conceal the mining activity as much as possible.</p> <p>13. During the construction of the mine infrastructure, consideration</p>					
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			<p>to the natural hues can be achieved by painting infrastructure with matt tones to help camouflage the infrastructure.</p> <p>14. Down-lighting should also be implemented to minimise light pollution at night.</p>					
	Soil	Prevent or minimise soil degradation	<ol style="list-style-type: none"> As far possible try to limit construction activities to the dry season (May – Oct) Prevent hydrocarbon spillages Restrict the extent of disturbance within the Project area 	Daily	MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; 2.CARA Section 4(1) and regulation 6(1)	<ol style="list-style-type: none"> Mine Plan Soil Management Plan. 	MLS	Environmental Manager/Environmental Control Officer/Mine Manager

			<p>and minimise activity within designated areas of disturbance</p> <ol style="list-style-type: none">3. Stripping operations should only be executed when soil moisture content will minimise the risk of compaction (during dry season)4. During stockpiling, preferably use the 'end-tipping' method to keep the stockpiled soils loose5. Ensure stockpiles are placed on a free					
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			draining location to limit waterlogging Physical demarcation of the working area ahead of construction must be undertaken to ensure that construction remains within the area to be disturbed 6. Access routes to / from / around the site will be designated prior to actual construction. 7. Should any evidence of soil contaminatio n be discovered,					
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			<p>appropriate measures should be taken to remediate the soil. (See hydrocarbons in surface water above).</p> <p>8. The temporary by-pass road must be rehabilitated as per the methodology outlined in the EMP after construction.</p> <p>9. Compacted soil must be rip and suitably ameliorated to ensure the successful establishment of vegetation.</p>					
	Flora	Limit footprint of disturbed areas		Daily / Monthly	1.National Environmental Management Act (Act No. 107 of 1998)	1.Biodiversity Management Plan	MLS	Environmental Manager/Environmental Control Officer

			<p>1. Highly sensitive areas should be avoided. These include all Ridges, Bushveld and Impacted Ridge Bushveld areas with the exception of the Ridge Bushveld that will be impacted on by the tailing facilities</p> <p>2.Areas that are not directly affected by mining activities should be conserved</p> <p>3.Where SSC are encountered, permits for the removal of these species must be obtained</p>		<p>2. National Water Act (Act No. 36 of 1998)</p> <p>3.Conservation of Agricultural Resources Act (Act No. 43 of 1983)</p> <p>4.The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or protected species a legal status and protection</p>	<p>2.Alien Invasive Control Management Plan</p> <p>3.Rehabilitation Plan</p>		
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			4.A nursery is recommended which will serve to propagate indigenous species in order that they can restore disturbed areas, immediately after an activity has ceased					
	Fauna	Limit footprint of disturbed areas	<p>1.Do not develop near or on the areas of Very High Sensitivity (e.g. wetlands and riparian edges)</p> <p>2.Where SSC encountered, permits for the removal of these</p>	Daily/ Weekly /Monthly	<p>1.National Environmental Management Act (Act No. 107 of 1998)</p> <p>2. National Water Act (Act No. 36 OF 1998)</p> <p>3. Conservation of Agricultural Resources Act (Act No. 43 of 1983)</p> <p>4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or</p>	<p>1. Biodiversity Management Plan</p> <p>2.Rehabilitation Plan</p>	MLS	Environmental Manager/Environmental Control Officer

			species must be obtained.		protected species a legal status and protection			
	Noise	To prevent the noise emanating from the construction machinery having an impact on the sensitive receptors	<p>1. As far as possible keep constructions activities to daylight hours</p> <p>2. Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers</p> <p>3. Switching off equipment when not in use</p>	<p>1. Vehicles to be serviced according to service plan</p> <p>2. Machinery to be switched off when not in use</p> <p>3. Construction activities must be limited to day time hours</p>	<p>1. National Environmental Management Air Quality Act (Act 39 of 2004)</p> <p>2. Environmental Conservation Act (Act 73 of 1989)</p>	<p>1. Noise Monitoring Programme</p> <p>2. Regular vehicle inspections</p>	Construction Phase	Environmental Manager/ Environmental Control Officer

			4. Fixed noise producing sources such as generators, pump stations to be either housed in enclosures or barriers put up around the noise source					
	Air Quality	To minimise/ prevent fugitive dust from being released	<p>1. The area of disturbance must be kept to a minimum and no unnecessary clearing of vegetation must occur</p> <p>2. Topsoil should be re-vegetated to reduce the exposed areas.</p> <p>3. During the loading of topsoil onto trucks or stockpiles, the dropping heights</p>	Daily / Weekly	National Environment Management: Air Quality Act (Act No. 39 of 2004	Air Quality Monitoring Plan	Construction phase	Environmental Manager/ Environmental Control Office

			<p>should be minimised.</p> <p>4. Dust suppression must occur on the mining site and in areas where significant dust may be generated.</p>					
<p>2. Construction of surface infrastructure e.g. access roads, pipes, storm water diversion berms, change houses, admin blocks etc.</p>	<p>Topography</p>	<p>To minimise topography, change and disruption of surface water flow</p>	<p>1. Limit the surface area of infrastructure where possible</p> <p>2. Store construction materials away from surface water and drainage lines</p> <p>3. Numerous roads should not be constructed alongside each other</p>	<p>Weekly</p>	<p>N/A</p>	<p>1. Mine Plan</p> <p>2. Surface water Monitoring Plan</p>	<p>MLS</p>	<p>Environmental Manager/Environmental Control Officer/ Mine Manager</p>

	Visual	To minimise the negative visual impact caused by the construction of surface infrastructure	<ol style="list-style-type: none"> 1. The area of the surface infrastructure should be limited where possible 2. Surface infrastructure should be painted with natural hues so as to blend into the surrounding landscape where possible 3. Down lighting should be implemented to minimise light pollution at night 4. Pylons and metal structures should be galvanised so as to weather to a 	Weekly	N/A	Mine Plan	MLS	Environmental Manager /Environmental Control Officer Mine Manager
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			<p>matt grey finish rather than be painted silver. If pylons and metal structures are to be painted it is recommended that a neutral matt finish be used</p> <p>5. Construction of vegetation berms should be implemented close to infrastructure so that vegetation can be established</p> <p>6. Numerous haul roads should not be created alongside each other</p> <p>7. Roads should be wetted</p>					
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			frequently by means of a water bowser to suppress dust					
	Soil	<ol style="list-style-type: none"> 1. Prevent or minimise soil degradation 2. Minimise soil compaction 	<ol style="list-style-type: none"> 1. Refer to the mitigations measures for soil in the Site Clearing activity section above 2. Vehicles need must stay on designated routes and roads 	Daily	MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; CARA Section 4(1) and regulation 6(1)	<ol style="list-style-type: none"> 1. Mine Plan 2. Soil Management Plan 	MLS	Environmental Manager /Environmental Control Officer /Mine Manager
	Flora	Limit footprint of disturbed areas	Refer to the mitigation measures for flora in the Site Clearing activity section above	Daily/Monthly	<ol style="list-style-type: none"> 1. National Environmental Management Act (Act No. 107 of 1998) 2. National Water Act (Act No. 36 of 1998) 3. Conservation of Agricultural Resources Act (Act No. 43 of 1983) 4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or protected species a 	<ol style="list-style-type: none"> 1. Biodiversity Management Plan 2. Weed Control and Alien Invasive Control Plan 3. Rehabilitation Plan 	MLS	Environmental Manager/Environmental Control Officer

					legal status and protection			
	Fauna	Limit footprint of disturbed areas	Refer to the mitigation measures for fauna in the Site Clearing activity section above	Monthly	<ol style="list-style-type: none"> 1. National Environmental Management Act (Act No. 107 of 1998) 2. National Water Act (Act No. 36 OF 1998) 3. Conservation of Agricultural Resources Act (Act No. 43 of 1983) 4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or protected species a legal status and protection 	<ol style="list-style-type: none"> 1. Biodiversity Management Plan 2. Weed Control and Alien Invasive Control Plan 3. Rehabilitation Plan 	MLS	Environmental Manager/ Environmental Control Officer
	Noise	To prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	Refer to the mitigation measures for noise in the Site Clearing activity section above	Refer to the frequency for noise in the Site Clearing activity section above	<ol style="list-style-type: none"> 1. National Environmental Management Air Quality Act (Act 39 of 2004) 2. Environmental Conservation Act (Act 73 of 1989) 	<ol style="list-style-type: none"> 1. Noise Monitoring Programme 2. Regular vehicle inspections 	Construction phase	Environmental Manager/ Environmental Control Officer
	Air Quality	To minimise/prevent	Refer to the mitigation measures for air quality in the	Daily/Weekly	National Environment Management: Air Quality Act (Act No. 39 of 2004)	<ol style="list-style-type: none"> 1. Air Quality Monitoring Plan 	Construction phase	Environmental Manager/ Environmental Control Officer

		fugitive dust from occurring	construction of surface infrastructure section above					
	Surface Water Quality	To prevent water quality deterioration through siltation	<ol style="list-style-type: none"> 1. Containment of all stormwater runoff according to the storm water management programme 2. No storage of hydro-carbon permitted at the construction site, with the exception of a diesel bowser for generators used for lighting purposes. 3. Frequent inspections of vehicles and machinery must be undertaken to 	Daily	National Water Act (Act 36 of 1998)	<ol style="list-style-type: none"> 1. Surface water Monitoring Plan 2. Stormwater Management Programme 	MLS	Environmental Manage/Environmental Control Officer /Mine Engine

			<p>identify oil leaks / spills. Leaking machinery must be removed off site for maintenance purposes. No maintenance of vehicles or machinery must be undertaken onsite.</p> <p>4. In the event of fuel or hydrocarbon spillage, soil will be removed to a designated area for bioremediation with suitably recognized product designed for this purpose.</p>					
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	Surface Water Quantity	Increase the water reporting to the catchment	The dirty water area isolated from the catchment must be minimized to reduce the volume of runoff prevented from reporting to the catchment	Daily/Weekly	National Water Act (Act 36 of 1998)	1. Stormwater Management Programme	MLS	Environmental Manager /Environmental Control Officer Mine Manager 
3. Transportation of materials and workers on site	Topography	<ol style="list-style-type: none"> To minimise topography, change and disruption of surface water flow To minimise soil erosion and topsoil loss 	<ol style="list-style-type: none"> Numerous roads should not be constructed alongside each other Ensure that drainage off roads does not result in soil erosion 	Weekly	N/A	<ol style="list-style-type: none"> Surface Water Monitoring Plan Soil Management Plan 	MLS	Environmental Manager /Environmental Control Officer Mine Manager
	Visual	To mitigate the negative visual impact caused by the drilling, blasting and development of	<ol style="list-style-type: none"> The area of the surface infrastructure should be limited where possible Surface infrastructure should be 	Weekly	N/A	Mine Plan	MLS	Environmental Manag/ Environmental Control Officer Mine manager

		infrastructure for mining	<p>painted with natural hues so as to blend into the surrounding landscape where possible</p> <p>3. Down lighting should be implemented to minimise light pollution at night</p> <p>4. Pylons and metal structures should be galvanised so as to weather a matt grey finish rather than be painted silver. If pylons and metal structures are to be painted it is recommended that a neutral matt finish be used</p> <p>5. Construction of vegetation berms should be</p>					
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			implemented close to infrastructure so that vegetation can be established					
	Air Quality	Minimise the generation of dust and fugitive emissions	<ol style="list-style-type: none"> 1. Speed limits need to be observed and erecting speed humps 2. Application of wetting agents or application of dust suppressant to bind soil surfaces to avoid soil erosion 3. During the loading of topsoil onto trucks or stockpiles, the dropping heights should be minimised 4. Roads must be sealed as for as possible using a 	Daily/Weekly	<ol style="list-style-type: none"> 1. National Environment Management: Air Quality Act (Act No. 39 of 2004) 	<ol style="list-style-type: none"> 1. Air Quality Monitoring Plan 	Construction Phase	<ul style="list-style-type: none"> • Environmental Manager] • Environmental Control Officer • Mine Manager

			bitumen coating					
4. Excavation, blasting and development of infrastructure for mining	Topography	To minimise topography change and disruption of surface water flow	Limit the surface areas of infrastructure where possible	Weekly	N/A	Mine Plan	MLS	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine Manager
	Visual	To mitigate the negative visual impact caused by the drilling, blasting and development of infrastructure for mining	Refer to the mitigation measures for visual in the Transportation of materials and workers on site section above	Weekly	N/A	Mine Plan	MLS	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine Manager
	Noise	To prevent the noise emanating from blasting / drilling activities from impacting on the sensitive receptors	Refer to the mitigation measures for noise in the Site Clearing activity section above	Refer to the frequency for noise in the Site Clearing activity section above	1. National Environmental Management Air Quality Act (Act 39 of 2004)	<ol style="list-style-type: none"> 1. Noise Monitoring Programme 2. Regular vehicle inspection 3. Blasting Programm 	Construction phase	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer

					■ Environmental Conservation Act (Act 73 of 1989)			
	Air Quality	To minimise/prevent fugitive dust from occurring	Refer to the mitigations measures for air quality in the construction of surface infrastructure section above	Daily/ Weekly	National Environment Management: Air Quality Act (Act No. 39 of 2004)	1. Air Quality Monitoring Plan	Construction phase	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer
	Surface Water Quality	Minimise the introduction of nutrients into surface water bodies	<ol style="list-style-type: none"> 1. Control stormwater run-off according to the management plan 2. Cut-off trenches should be constructed around the explosives area 3. Explosives to be stored in an 	Daily /Weekly	National Water Act (Act 36 of 1998)	1. Stormwater Management Programme	MLS	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine Manager

			enclosed area with an impermeable surface					
	Ground Water Quality	Prevent Seepage from the TSF	<ol style="list-style-type: none"> 1. Monitor water groundwater quality in the potentially affected areas 2. Toe drains should be installed on the downslope sides of the TSF to capture any shallow seepage within the unsaturated zone 	Daily/Weekly	National Water Act (Act 36 of 1998)	<ol style="list-style-type: none"> 1. Groundwater Monitoring Plan 	MLS	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine Manager
5. Temporary storage of hazardous chemicals and fuels	Soil	Prevent and minimise soil contamination	<ol style="list-style-type: none"> 1. Construction vehicles and equipment should be serviced regularly, in a designated area 2. Service areas must be paved 	Daily /Weekly	MPRDA Regulation 56 (1) to (8); soil pollution and erosion control	<ol style="list-style-type: none"> 1. Soil Management Plan 2. Equipment Maintenance Plan 3. Incident register and action plan 	MLS	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer

			<p>with concrete paving</p> <p>3. Construction vehicles should remain on designated and prepared compacted gravel roads</p> <p>4. Areas that are used to store hydrocarbons must be banded and be able to contain the hydrocarbons in the event of a spillage occurring</p> <p>5. Drip trays must be used when machinery and/or vehicles are serviced</p> <p>6. Spill containment</p>			4. Emergency Response Plan		
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			and clean up kits should be available onsite and clean-up from any spill must be in place and executed at the time of a spillage with appropriate disposal as necessary					
	Surface water quality	Prevent/contain spillages of hazardous material	1. Refer to the mitigation measures for aquatics in the Temporary storage of hazardous chemicals and fuels above	Continuously	National Water Act (Act 36 of 1998)	1. Material Safety Data Sheets 2. Surface water monitoring plan	Construction phase	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control officer
	Ground Water	Prevent/contain spillages of hazardous material	1. All spillages of hazardous materials should be cleaned up immediately 2. Clean-up spill kits must be placed at all hazardous	Continuously	National Water Act (Act 36 of 1998)	1. Material Safety Data Sheets 2. Surface water monitoring plan	Construction phase	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control officer

			<p>material storage areas</p> <p>3. Store hazardous material according to manufacturing specifications</p> <p>4. Store hazardous material on cemented/concrete floor in a bunded area</p>					
Operation Phase								
6. Removal of PGM's (underground mining process)	Topography	To minimise subsidence resulting in topography change and disruption of surface water flow	Underground mining areas	Ensure that sufficient pillars are left to support	Weekly	N/A	1.Surface Water Monitoring Plan	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine Manager • Mine Engineer
	Visual		1. Store waste rock, tailings and stockpiled		Weekly	N/A	Mine Plan	<ul style="list-style-type: none"> • Environmental Manager

		<p>1. To reduce the negative visual impact caused by the mine and the associated infrastructure</p>	<p>ore away from surface water and drainage lines</p> <p>2. Limit the footprint area of the waste rock dumps, TSF and ore stockpile if possible</p> <p>3. Limit the quantity and time of ore stockpiled on site</p> <p>4. Ensure ore stockpiles, waste rock dumps and the TSF are contoured</p> <p>5. Ensure all dirty water is channelled towards</p>					<p>Environmental Control Officer</p> <ul style="list-style-type: none"> • Mine Manager • Mine Engineer
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			<p>pollution control dam</p> <p>6. Ensure berms are well maintained and contour</p>					
	Air Quality	To minimise the generation of fugitive dust generation and fugitive emissions	<p>1. Install, filtration systems to remove the pollutants from the air prior to surface release via the vent shaft</p> <p>2. Use of efficient diesel fuel (low sulphur ppm value) for heavy underground machinery</p>		Daily/Weekly	<p>1. National Environment Management: Air Quality Act (Act No. 39 of 2004)</p>	Air Quality Monitoring Plan	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer
	Ground Water Quantities	Minimise the impact on the groundwater table as a result of the underground works	Monitor the groundwater levels of the affected areas		Daily/Weekly	<p>2. National Water Act (Act 36 of 1998)</p>	Ground Water Monitoring Plan	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine Engineer

<p>7. Operation of surface infrastructure such as the operation of the mining shaft, crusher, pipelines, the TSF and processing plant (includes water use and storage on site, including pollution control dams)</p>	<p>Visual</p>	<ol style="list-style-type: none"> 1. To minimise the negative visual impact caused by the operation of the ore stockpile, waste rock dumps and TSF 2. To minimise the negative visual impact caused by the dust from operation of the crusher 	<ol style="list-style-type: none"> 1. The ore stockpile, waste rock dumps and TSF should be positioned to reduce visual disturbance where possible 2. The quantity and time of ore stored on site should be limited where possible 3. The height of the waste rock dumps and TSF should be limited where possible 4. The waste rock dumps and TSF should be 	<p>Weekly</p>	<p>N/A</p>	<ol style="list-style-type: none"> 1. Mine Plan 2. Erosion Control Plan 	<p>MLS</p>	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine Manager • Mine Engineer
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			<p>top soiled and vegetated where possible</p> <p>5. Dust suppression should be used during operation of surface crushing</p>					
	Soil	Prevent or minimise soil degradation	<p>1. Re-vegetate cleared areas and stockpiles to avoid water erosion losses</p> <p>2. Preserve looseness of stockpiled soil by executing fertilisation and seeding operations by hand</p> <p>3. Soil stockpiles should be monitored for</p>	Weekly	MPRDA Regulation 56 (1) to (8); soil pollution and erosion control	<p>1. Mine Plan</p> <p>2. Erosion Control Plan</p>	Operational Phase	<ul style="list-style-type: none"> • Environmental Manager • Environmental Control Officer • Mine manager • Mine Engineer

			fertility via sampling and testing					
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	Flora	Limit footprint of disturbed areas	<ol style="list-style-type: none"> 1. Areas of contiguous natural Bushveld must be managed on site and in adjacent sites where mining is proposed, as part of a Biodiversity Action Management Plan 2. Cleared areas should be monitored for colonisation by alien species and a proactive approach should be undertaken to control alien species as soon as they are established 3. Where possible use pesticides or techniques 	Monthly	<ol style="list-style-type: none"> 1. National Environmental Management Act (Act No. 107 of 1998) 2. National Water Act (Act No. 36 OF 1998) 3. Conservation of Agricultural Resources Act (Act No. 43 of 1983) 4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or protected species a legal status and protection 	Weed Control and Alien Invasive Control Plan	MLS	Environmental Manage/Environmental Control Officer
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			to control pests that will not harm the environment					
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	Fauna	Eliminate impact of pest control activities on the current fauna	Pesticides or techniques to control pests that will not harm the environment should be explored and used	Daily	<ol style="list-style-type: none"> 1. National Environmental Management Act (Act No. 107 of 1998) 2. National Water Act (Act No. 36 OF 1998) 3. Conservation of Agricultural Resources Act (Act No. 43 of 1983) 4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or protected species a legal status and protection 		MLS	Environmental Manager/Environmental Control Officer
	Noise	To prevent the noise emanating from the operation of machinery and equipment from impacting on the sensitive receptors	<ol style="list-style-type: none"> 1. Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective 	<ol style="list-style-type: none"> 1. Vehicles to be service according to service plan 2. Machinery to be switched 	<ol style="list-style-type: none"> 1. National Environmental Management Air Quality Act (Act 39 of 2004) 	<ol style="list-style-type: none"> 1. Noise monitoring programme 2. Regular vehicle inspections 	Operational Phase	Environmental Manager/Environmental Control Officer Mine Manager/Main

			<ul style="list-style-type: none"> e.g. installed exhaust mufflers 2. Switching off equipment when not in use 3. Fixed noise producing sources such as generators, pump stations to be either housed in enclosures or barriers put up around the noise source 	<ul style="list-style-type: none"> 3. Construction activities must be limited to day time hours 	<ul style="list-style-type: none"> 2. Environmental Conservation Act (Act 73 of 1989) 			<ul style="list-style-type: none"> tenance Workshop Manager / Supervisor
	Air Quality	To minimise the generation of fugitive dust generation and fugitive emissions	<ul style="list-style-type: none"> 1. Install water sprays around the crushing area 2. Ensure the crusher is enclosed 3. The TSF should undergo routine maintenance throughout the lifespan of the mine – with on-going re-vegetation 	Daily/Weekly	National Environment Management: Air Quality Act (Act No. 39 of 2004)	Air Quality Monitoring Plan	Operational Phase	Environmental Manager/Environmental Control Officer

			to avoid exposed surface amenable to wind erosion					
	Surface Water Quality	Minimise surface water run-off	<ol style="list-style-type: none"> 1. Only dirty water should be managed in the storm water management plan 2. No clean water should be stored 3. Runoff should be managed in such a manner that channel straightening and erosion does not result in habitat loss 	Daily/Weekly	National Water Act (Act 36 of 1998)	Surface water Monitoring Plan /Storm Water Management Programme	MLS	Environmental Manager/Environmental Control Officer/Mine Manager /Mine Engineer
	Ground Water Quality	Prevent seepage from the TSF	<ol style="list-style-type: none"> 1. Please refer to the mitigation measures for Groundwater quality in the blasting and development of infrastructure 	Daily/Weekly	National Water Act (Act 36 of 1998)	Groundwater Monitoring Plan	MLS	Environmental Manager/Environmental Control Officer/Mine Manager /Mine Engineer

			for mining section above					
8. Storage, handling and treatment of hazardous products (fuel, explosives, and oil) and waste activities (waste, sewage, discards, PCD)	Soil	Prevent or minimise soil contamination	1. Refer to the mitigation measures for soil in the temporary storage of hazardous chemicals and fuels above	Weekly	MPRDA Regulation 56 (1) to (8); soil pollution and erosion control	1. Mine Plan 2. Soil Management Plan	MLS	Environmental Manager/Environmental Control officer
	Surface Water Quality	Prevent/contain spillages of hazardous material	1. Refer to the mitigation measures for aquatics in the temporary storage of hazardous chemicals and fuels above	Continuously	National Water Act (Act 36 of 1998)	1. Material Safety Data Sheets 2. Groundwater Monitoring Plan	Operational phase	Environmental Manager/Environmental Control officer

	Ground Water Quality	Prevent/contain spillages of hazardous material	1. Refer to the mitigation measures for aquatics in the temporary storage of hazardous chemicals and fuels above	Continuously	National Water Act (Act 36 of 1998)	1. Material Safety Data Sheets 2. Groundwater Monitoring Plan	Operational phase	Environmental Manager/Environmental Control officer
Decommissioning Phase								
9. Demolition and removal of all infrastructure (including transportation off site)	Topography	To rehabilitate the topography	1. Ensure, as far possible, that all infrastructure is removed	Weekly	N/A	1. Rehabilitation Plan	1. Decommissioning Phase	Environmental Manager/Environmental Control Office/Mine Manager
	Visual	To increase the positive visual impact caused by the removal of all infrastructure	1. Ensure all unnecessary infrastructure is removed 2. Ensure all concrete	Weekly	N/A	1. Rehabilitation Plan	2. Decommissioning Phase	Environmental Manager/Environmental Control Officer/Mine Manager

			foundations are removed					
	Soil	To prevent or minimise soil degradation.	<ol style="list-style-type: none"> 1. Re-vegetate cleared areas and stockpiles to avoid water erosion losses 2. Monitoring of the condition of all unpaved roads is necessary due to the high rainfall and potential water runoff and erosion of the soils present in the Platreef Project site 	Weekly	<ol style="list-style-type: none"> 1. MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; CARA Section 4(1) and regulation 6(1) 	<ol style="list-style-type: none"> 1. Mine Plan 2. Soil Management Plan 	MLS	Environmental Manager/Environmental Control Officer Mine Manager
	Flora	Prevent the spread of alien species	<ol style="list-style-type: none"> 1. Cleared areas should be monitored for colonisation by alien species and a proactive approach should be undertaken to control alien species as soon 	Monthly	<ol style="list-style-type: none"> 1. National Environmental Management Act (Act No. 107 of 1998) 2. National Water Act (Act No. 36 OF 1998) 3. Conservation of Agricultural Resources Act 	<ol style="list-style-type: none"> 1. Biodiversity Management Plan 2. Rehabilitation Plan 	Decommissioning Phase	Environmental Manager/Environmental Control Officer

			<p>as they are established</p> <p>2. Re-vegetate areas where infrastructure has been demolished</p>		<p>(Act No. 43 of 1983</p> <p>4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or protected species a legal status and protection</p>	<p>3. Weed Control and Alien Invasive Control Plan</p>		
	Surface Water Quantity)	Minimise surface water run-off	Only dirty water should be managed in the storm water management plan	Daily/weekly	National Water Act (Act 36 of 1998)	Stormwater Management Program	MLS	Environmental Manager/Environmental Control Officer
	Noise	To prevent the noise emanating from the demolition activities from impacting on the sensitive receptors	<p>1. As far as possible keep operational activities to daylight hours</p> <p>2. Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms</p>	<p>1. Vehicles to be serviced according to service plan</p> <p>2. Machinery to be switched</p>	<p>1. National Environmental Management Air Quality Act (Act 39 of 2004)</p> <p>2. Environmental Conservation Act (Act 73 of 1989)</p>	<p>1. Noise monitoring programme</p> <p>2. Regular vehicle inspections</p>	Decommissioning Phase	Environmental Manager/Environmental Control Officer/Mine Manager/Maintenance/Workshop Manager / Supervisor

			<p>are effective e.g. installed exhaust mufflers</p> <ol style="list-style-type: none"> Switching off equipment when not in use Fixed noise producing sources such as generators, pump stations to be either housed in enclosures or barriers put up around the noise source 	<p>off when not in use.</p> <ol style="list-style-type: none"> Construction activities must be limited to day time hours 				
	Air Quality	To minimise/prevent fugitive dust from occurring	<ol style="list-style-type: none"> The area of disturbance must be kept to a minimum Dust suppression must be applied to areas where possible dust could generate from 	Daily/weekly	National Environmental Management Air Quality Act (Act 39 of 2004)	Air Quality Monitoring Plan	Decommissioning Phase	Environmental Manager/Environmental Control Officer
	Ground water Quality	Prevent/contain possible hydrocarbon spillages	<ol style="list-style-type: none"> Maintain vehicles on a regular basis 	Continuously	National Water Act (Act 36 of 1998)	Implement vehicle maintenance schedule	<ol style="list-style-type: none"> Decommissioning Phase 	Environmental Manager/Environmental Control

			2. Make use of oil pans in/under vehicles					Officer/Mine Manager
10. Rehabilitation (spreading of soil, re-vegetation and profiling/contouring) (ventilation shaft entrances)	Topography		<p>1. Shaft voids must be plugged and closed</p> <p>2. Ensure that the rehabilitated area is re-contoured and profiled to topography similar to the pre-development topography</p> <p>3. Spread soil over the rehabilitated area</p> <p>4. Ensure that surface water and drainage lines are rehabilitated to pre-development condition</p> <p>5. Re-vegetate rehabilitated areas</p>	Weekly	N/A	<p>1. Rehabilitation Plan</p> <p>2. Surface</p> <p>3. Water Monitoring Plan</p> <p>4. Erosion Control Plan</p>	Decommissioning Phase	Environmental Manager/Environmental Control Officer /Mine Manager

	Soil		<ol style="list-style-type: none"> 1. Re-vegetate cleared areas and stockpiles to avoid water erosion losses 2. Preserve looseness of stockpiled soil by executing fertilisation and seeding operations by hand 3. Soil stockpiles should be monitored for fertility via sampling and testing 	Weekly	<ol style="list-style-type: none"> 1. MPRDA Regulation 56 (1) to (8); soil pollution and erosion control; CARA Section 4(1) and regulation 6(1) 	<ol style="list-style-type: none"> 1. Mine Plan/Soil Management Plan 	Decommissioning Phase	Environmental Manager/Environmental Control Office/Mine Manager
	Flora		<ol style="list-style-type: none"> 1. Cleared areas should be monitored for colonisation by alien species and a proactive approach should be undertaken to 	Monthly	<ol style="list-style-type: none"> 1. National Environmental Management Act (Act No. 107 of 1998) 2. National Water Act (Act No. 36 OF 1998) 	<ol style="list-style-type: none"> 1. Biodiversity management plan 2. Rehabilitation plan 	Decommissioning Phase	Environmental Manager/Environmental Control Officer /Mine Manager

			control alien species as soon as they are established		<ul style="list-style-type: none"> 3. Conservation of Agricultural Resources Act (Act No. 43 of 1983) 4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords threatened or protected species a legal status and protection 			
11. Storage, handling and treatment of hazardous products (fuel, explosives, oil) and waste activities (waste, sewage)	Soil	Prevent and minimise soil contamination	<ul style="list-style-type: none"> 1. Refer to the mitigation measures for soil in the temporary storage of hazardous chemicals and fuels above 	Daily	<ul style="list-style-type: none"> 1. MPRDA Regulation 56 (1) to (8); soil pollution and erosion control 	<ul style="list-style-type: none"> 1. Soil Management Plan 2. Mine Maintenance Plan 3. Incident register and action plan 4. Emergency Response Plan 	MLS	Environmental Manager/Environmental Control Officer Mine Manager/Main maintenance workshop manager / supervisor

	Surface Water Quality	Prevent/contain spillages of hazardous material	1. Refer to the mitigation measures for soil in the temporary storage of hazardous chemicals and fuels above	Continuously	1. National Water Act (Act 36 of 1998)	1. Material Safety Data Sheets 2. Groundwater Monitoring Plan	Decommissioning phase	Environmental Manager/Environmental Control officer
	Ground Water Quality	Prevent/contain spillages of hazardous material	1. Refer to the mitigation measures for soil in the temporary storage of hazardous chemicals and fuels above	Weekly	1. National Water Act (Act 36 of 1998)	1. Material Safety Data Sheets 2. Groundwater Monitoring Plan	Decommissioning phase	Environmental Manager/Environmental Control Office/Mine Manager
Post- Closure Phase								
Post-closure monitoring and rehabilitation	Topography	1. To rehabilitate the topography 2. To minimise soil erosion	1. Ensure that the post-development topography is as close as possible to the pre-	Weekly	N/A	1. Rehabilitation plan 2. Erosion Control Plan	Post-closure phase	Environmental Manager/Environmental Control

			<p>development topography byre-contouring and profiling the study area</p> <ol style="list-style-type: none"> 2. Ensure that surface water and drainage lines are rehabilitated to pre-development condition 3. Carefully monitor rehabilitated areas to ensure that soil erosion is prevented 					Office/Mine Manage
	Visual	To increase the neutral visual impacts of post-closure rehabilitation	Ensure that all disturbed areas are rehabilitated to a state as close as possible to the pre-development state	Weekly	N/A Weekly	1. Rehabilitation Plan	B Post-closure phase	Environmental Manager/Environmental Control Officer/Mine Manage

	Soil	Monitor the sustainability of the current soil rehabilitation.	<ol style="list-style-type: none"> 1. Post mine soil survey to be conducted (annually) 2. Soil fertility testing to be conducted annually 	<p>Weekly /Month</p> <p>/Annually</p>	<ol style="list-style-type: none"> 1. MPRDA Regulation 56 (1) to (8); soil pollution and erosion control 	<ol style="list-style-type: none"> 1. Soil management plan 2. Mine Maintenance plan 3. Incident register and action plan 4. Emergency response plan 	MLS	Environmental Manager/ Environmental Control Officer Mine Manager/Main tenance workshop manager / supervisor
	Flora	<ol style="list-style-type: none"> 1. Prevent the spread of alien species 2. Successful re-vegetation of areas 	<ol style="list-style-type: none"> 1. Cleared areas should be monitored for colonisation by alien species and a proactive approach should be undertaken to control alien species as soon as they are established 2. Re-vegetate cleared areas of the infrastructure footprint 	Monthly	<ol style="list-style-type: none"> 1. National Environmental Management Act (Act No. 107 of 1998) 2. National Water Act (Act No. 36 OF 1998) 3. Conservation of Agricultural Resources Act (Act No. 43 of 1983) 4. The National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) affords 	<ol style="list-style-type: none"> 1. Biodiversity management plan 2. Rehabilitation plan 	Post-closure phase	Environmental Manage/Enviro nmental Control Office

					threatened or protected species a legal status and protection			
	Air quality	To minimise/prevent fugitive dust from occurring	<ol style="list-style-type: none"> Demolition should not be performed during windy periods (August, September and October) The area of disturbance must be kept to a minimum 	Daily /Weekly	<ol style="list-style-type: none"> National Environment Management: Air Quality Act (Act No. 39 of 2004) 	<ol style="list-style-type: none"> Air quality monitoring plan 	Post-closure phase	Environmental Manager/Environmental Control Office
	Aquatics	To monitor the state of the aquatic ecosystem through the measurement of physical and biological properties	<ol style="list-style-type: none"> Bi-annual aquatic biomonitoring 	Bi-annually	<ol style="list-style-type: none"> National Water Act (Act 36 of 1998) 	<ol style="list-style-type: none"> Material Safety Data Sheets Groundwater monitoring plan 	Decommissioning phase	Environmental Manager/Environmental Control Office

4.SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATIONS

Table 4: Showing summary of possible environmental Impacts

PLANNING& CONSTRUCTION PHASE			
Potential impacts: Construction Phase	Significant rating of impacts	Proposed Mitigation Measures	Significant rating of impacts after mitigation
1. Topography			
<p>Permanent structures: Slimes Dams, Tailings dumps, open pits</p> <p>Temporary structures: storage dam, stockpiles</p> <p>Altering of the drainage</p>	<p>Duration: Long-term (3) Spatial: Localised (1) Significance: High (3) Likelihood: Definitely (4) Certainty: Probable</p>	<ul style="list-style-type: none"> • Ensure that drainage patterns in the high areas are: Free draining and do not create pools; • Employ effective rehabilitation strategies to restore surface topography of tailings dumps and plant site. • Dispersed into adjacent grasslands regularly so as to avoid concentration of water in such a manner that it may contribute to erosion. Tie into the adjacent terrain. 	<p>Duration: Medium-term (2) Spatial: Localised (1) Significance: Low (1) Likelihood: May occur (3) Certainty: Possible</p>
Rating	Collective Rating= 12	Rating	Collective Rating= 7
2. Soils Erosion			
<p>During construction vegetation will be cleared, and soils excavated. The movement, handling, and exposure of soils will result in an increased risk of soil erosion.</p> <p>The movement of vehicle traffic onsite will result in the compaction of soils. Soil compaction prevents the successful re-establishment of vegetation.</p>	<p>Duration: Short-term (1) Spatial: Localised (2) Significance: High (3) Likelihood: Definitely (4) Certainty: Probable</p>	<p>Physical demarcation of the working area ahead of construction must be undertaken to ensure that construction remains within the area to be disturbed.</p> <p>Access routes to / from / around the site will be designated prior to actual construction.</p> <p>Should any evidence of soil contamination be discovered, appropriate measures should be</p>	<p>Duration: Short-term (1) Spatial: site (1) Significance: Low (1) Likelihood: May occur (3) Certainty: Possible</p>

<p>During the construction phase inadequate waste management may result in soil pollution.</p> <p>During excavation the mixing of soil substrates, and soil type will result in a reduction of soil fertility.</p>		<p>taken to remediate the soil. (See hydrocarbons in surface water above).</p> <p>The temporary by-pass road must be rehabilitated as per the methodology outlined in the EMP after construction.</p> <p>Compacted soil must rip and suitably ameliorated to ensure the successful establishment of vegetation.</p> <p>Care must be taken during excavation and vegetation clearing to ensure that clay soils and sandy / silty soils are stockpiled separately, and returned to their former position during rehabilitation.</p> <p>The location of soil stockpiles must be identified prior to construction, and will not be located at a position where they are likely to be washed away.</p>	
Ratings	Rating=10	Ratings	Rating =6
3. Geology			
<p>During construction, concrete slabs/footings will be excavated to support the buildings infrastructure. The maximum depth of the excavations is unlikely to exceed 1.5m. Consequently, these excavations will not extend to the bedrock underlying the surface soils and thus no impact will be created.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: High (3) Likelihood: Definitely (4) Certainty: Probable</p>	<p>The excavation will not exceed 1.5m underground because the area is underground lying rock.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: Low (1) Likelihood: May occur (3) Certainty: Possible</p>
Ratings	=7	Rating	=6
4. Culture/Heritage/Archaeology			

<p>No archaeological, paleontological site, artefacts or feature exist on the existing site.</p> <p>No historical/cultural site, artefacts or feature exist on the existing site.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: High (3) Likelihood: Definitely (4) Certainty: Probable</p>	<p>If during construction, any archaeological finds are made (e.g. stone tools, skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds.</p> <p>Archaeological artefacts generally occur below surface, the possibility exists that culturally significant material and skeletal remains may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist (See National Heritage and Resources Act, 25 of 1999 section 36 (6)).</p> <p>Should the need arise to expand the development beyond the current scope demarcated area, the following applies: a qualified archaeologist must conduct a full Phase assessment on the sections beyond the demarcated areas which will be affected by the expansion, in order to determine the occurrence and extent of any archaeological sites and the impact development might have on these sites.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: Low (1) Likelihood: May occur (3) Certainty: Possible</p>
Ratings	=10	Rating	=7
5. Fauna and Flora			
<p>During the construction phase the primary impacts to terrestrial ecology will be experienced as a result of vegetation clearing and habitat destruction. Removal of vegetation during construction.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: high (3) Likelihood: Definitely (4)</p>	<p>A management plan for control of invasive plant species needs to be implemented on all areas of the mining areas. This will be most viable with the implementation of a buffer zone.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: Moderate (2)</p>

<p>The game which occurs naturally on site will be disturbed and might move away from the site.</p> <p>Areas disturbed by construction may be expected to geminate alien invasive species.</p> <p>Impacts on the plant species: Increased traffic, Construction vehicles and destruction of natural habitat.</p>	<p>Certainty: Possible</p>	<p>During the removal of the soil, the topsoil or A-zone should be stored separately from the other zones. A soil scientist should be employed during this phase of the mine. The scientist should test the soil during this phase of the mine.</p> <p>A buffer zone should be implemented surrounding the watercourse areas.</p> <p>The watercourses are extremely important in providing valuable ecosystem services and it is essential that no mining occurs there. Buffer zones should be clearly demarcated as a no-go zone. Any species that are either endemic or vulnerable should be relocated to favourable sites with the help of a specialist prior to vegetation removal for the construction of the mine. This should be done or assessed before the construction of the mine commences to ensure that these species are relocated.</p> <p>To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees.</p> <p>Activities on site must comply with the regulations of the Animal Protection Act 1962 (Act No. 71 of 1962). Workers should also be advised on the penalties associated with the needless destruction of wildlife, as set out in this act.</p>	<p>Likelihood: May occur (3) Certainty: Possible</p>
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		<p>Activities should not commence near the surface water areas or wetlands on the specific Portion of the specific mining areas.</p> <p>The construction area should be well demarcated and construction workers should not enter into adjacent areas.</p> <p>Mixing of concrete or collection of building material must be restricted to designated sites to minimize the impact.</p> <p>Plant removal may result in soil erosion; thus, storm water management procedures need to be put into place.</p> <p>Continuous rehabilitation of the area should occur during construction.</p>	
Ratings	=10	Ratings	=7
6. Ground Water			
No impacts to ground water are expected from the construction phase.	<p>Temporal: Short-term (2)</p> <p>Spatial: Localised (0)</p> <p>Significance: high (1)</p> <p>Likelihood: May occur (0)</p> <p>Certainty:</p>	No impacts to ground water are expected during construction phase.	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (0)</p> <p>Significance: high (0)</p> <p>Likelihood: May occur (0)</p> <p>Certainty:</p>
Ratings	= 3	Ratings	= 1
7. Surface Water			
Oil and grease spills from construction vehicles may enter the construction site resulting in surface water contamination by a hazardous substance.	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (2)</p> <p>Significance: High (3)</p>	<p>Hydro-carbons</p> <p>No storage of hydro-carbon permitted at the construction site, with the exception of a diesel bowser for generators used for lighting purposes.</p>	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (2)</p> <p>Significance: Low (1)</p>

<p>Accidental spillage of sewage and chemicals from temporary ablution facilities may enter the construction site and result in surface water contamination.</p> <p>Incorrectly managed storm water may carry loose soils and gravels from exposed areas into the construction site. This may result in an increase in turbidity and sediment deposition downstream of the river crossing site.</p> <p>Uncontrolled extraction of surface water from the construction site during the construction phase may result in reduced water quantity downstream of the abstraction point. Downstream water users include stock watering, which may be negatively impacted.</p> <p>The insufficient management of waste may result in pollution of surface water resources.</p>	<p>Likelihood: Definitely (4) Certainty: Probable</p>	<p>A temporary “bund” area constructed of soil / inert construction waste must be constructed and lined with a suitable liner.</p> <p>Frequent inspections of vehicles and machinery must be undertaken to identify oil leaks / spills. Leaking machinery must be removed off site for maintenance purposes. No maintenance of vehicles or machinery must be undertaken onsite.</p> <p>In the event of fuel or hydrocarbon spillage, soil will be removed to a designated area for bioremediation with suitably recognized product designed for this purpose.</p> <p>Sanitation / Ablution Facilities Proper sanitation facilities must be made available for contractors.</p> <p>The contractor, in consultation with the ECO, shall compile a surface water drainage plan prior to commencement with construction.</p> <p>At least 1 toilet per 15 workers will be provided. A licensed contractor will be utilized to provide and service temporary ablution facilities.</p> <p>Water abstraction All water pumped from the construction site should be measured and recorded. The general authorization volume of water abstraction may not be exceeded on a monthly basis as per the Water use License.</p>	<p>Likelihood: May occur (3) Certainty: Possible</p>
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		<p>Waste Management Measures Ensure that all waste generated on site is sorted into appropriate containers.</p> <p>Waste bins should be emptied regularly and should never overflow.</p> <p>Waste must be removed by a suitably licensed contractor and disposed of at a licensed facility.</p> <p>Building rubble utilized in the construction of the concrete supports must be comprised of inert material.</p> <p>No burning / incineration of waste is to take place on the site.</p>	
Rating	=10	Rating	=7
8. Air Quality			
<p>The source of air quality impacts is:</p> <ul style="list-style-type: none"> • Gases and fumes from construction vehicles; and • Fugitive dust emissions from vehicle traffic traversing gravel roads. <p>Neither pose significant health impacts, however fugitive dust emissions will pose a significant nuisance dust factor on neighbouring farmers in close proximity to the proposed construction site.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: Moderate (2) Likelihood: Unlikely (2) Certainty: Possible</p>	<p>Low or in-pit dumping of overburden during high wind use of a global positioning system as a tool to track the locations of mining and dust suppression equipment (e.g. water carts) and cross-referencing this information with real-time weather monitoring to assist with dust control</p> <p>Use of water sprays at each contact or transfer point along the conveyance system which has adjustable rates of application (low, medium and high) depending on dust levels</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: Low (1) Likelihood: Unlikely (1) Certainty: Possible</p>

		<p>Automatic water sprays installed at the ROM hopper bin that produce a fine mist to suppress dust generated with the triggering of sensors when a truck enters the dump zone and automatic sprays activated until a set time following the departure of the truck</p> <p>Use of a reclaim tunnel at the product ore stockpile and an enclosed conveyor to transfer ore to the loader, both of which minimise dust generation</p> <p>Use of a retractable telescopic chute with curtains to load ore into carriages/trucks and conditions.</p> <p>All construction vehicles should be regularly serviced and maintained to ensure minimal exhaust fume pollution.</p> <p>No fire should be permitted on site.</p> <p>Exposed soils (i.e. soil stockpiles, gravel access roads, material laydown area) will be regularly watered to reduce wind-blown dust.</p>	
Ratings	=7	Ratings	=5
9. Noise			
<p>The noise generated during the construction phase will predominantly result from vehicle activity on site, as well as the operation of heavy machinery and other associated noises. The noise of vehicles and machinery may affect the farm dwellers and neighbouring farmers in the area. The impact of noise will most definitely impact on neighbouring farmers.</p>	<p>Temporal: Short-term (1) Spatial: Localised (2) Significance: Moderate (2) Likelihood: Definite (4) Certainty: Probably</p>	<p>Contractors will be required to wear the appropriate Personal Protective Equipment (PPE) during the construction phase such as masks, protection glasses, ear plugs, gloves, safety boots, and overalls.</p> <p>Ensure that all contractors have appropriate induction and safety training, and understand the dangers to which they will be exposed.</p>	<p>Temporal: Short-term (1) Spatial: Localised (1) Significance: Low (1) Likelihood: May occur (3) Certainty: Possible</p>

		<p>Contractors should be appropriately trained as to safe working procedures prior to commencing with work.</p> <p>Construction activities are to be limited to day light working hours.</p> <p>No construction crews are to be accommodated onsite after hours, except for a night watchman.</p> <p>Activities generating noise to be carried out between 6 am – 6 pm (Monday to Saturday) only.</p> <p>Local visitors/tourist to be informed/notified that excessive noise levels are expected.</p>	
Ratings	=9	Rating	=6
10. Aesthetic and Visual Impact			
<p>The aesthetic characteristics associated with the proposed construction at the proposed site will continue during the construction phase.</p> <p>External lighting from camp site will affect the night time character of the area for local communities.</p>	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (2)</p> <p>Significance: Moderate (2)</p> <p>Likelihood: May occur (3)</p> <p>Certainty: Probably</p>	<p>During the construction of the mine infrastructure, consideration to the natural hues can be achieved by painting infrastructure with matt tones to help camouflage the infrastructure.</p> <p>Construction activities and associated infrastructure to be shielded/concealed as far as possible.</p> <p>Construction activities are to be limited to day light working hours.</p> <p>No construction crews are to be accommodated onsite after hours, except for a night watchman.</p> <p>Low level and frequency lighting are to be utilized wherever possible</p>	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (2)</p> <p>Significance: Low (1)</p> <p>Likelihood: May occur (1)</p> <p>Certainty: Possible</p>

		<p>. Dust from Stockpile areas, roads and other activities must be managed by means of dust suppression to prevent excessive dust.</p> <p>Stockpiles should not exceed 15m in height. Rehabilitation of the area must be done as the mining is completed.</p> <p>The visual impact can be minimized by the creation of a visual barrier.</p> <p>The retention of as much existing vegetation as possible, specifically the existing mature trees in the area to conceal the mining activity as much as possible.</p> <p>During the construction of the mine infrastructure, consideration to the natural hues can be achieved by painting infrastructure with matt tones to help camouflage the infrastructure.</p> <p>Down-lighting should also be implemented to minimise light pollution at night.</p>	
Ratings	=8	Rating	=5
11. Traffic			
The construction is located far from the public; however, the most significant impacts will be as a result of construction vehicles and heavy machinery on site.	Duration: Short-term (1) Spatial: Localised (2) Significance: high (3) Likelihood: May occur (3) Certainty: Probably	Ensure that adequate path/road diversions for visitors/tourist/pedestrians are installed during the construction phase. Road Traffic regulations must be observed	Temporal: Short-term (1) Spatial: Localised (2) Significance: Moderate (2) Likelihood: May occur (2)

		Regular maintenance of the road should be done. Speed restriction of 40h/r must be adhered to when driving onsite.	Certainty: Possible
Ratings	=9	Rating	=7
12. Socio-Economic			
Due to the size of the project only a marginal positive economic impact is anticipated during the construction phase. There would be no marginal short-term increase in employment in the area due to the socio-economic profile of the area.	Temporal: Short-term (1) Spatial: Localised (2) Significance: high (3) Likelihood: Definitely (4) Certainty: Possible	It is recommended that Invest In Property 126 (Pty)Ltd and the appointed contractor liaise with the Neighbours and affected residents to resolve the encroachment issue.	Temporal: Short-term (1) Spatial: Localised (2) Significance: Moderate (2) Likelihood: May occur (3) Certainty: Possible
Ratings	=10	Rating	=8
13. Health and Safety			
During the construction phase numerous people will have access to the site and this creates a potential safety and security risk. Explosion and fire risks. Except for fuel and oil used in construction equipment, no combustible materials will be used; therefore, increased risk of fire and explosion would be unlikely. Significant risks to public health and safety are not anticipated.	Temporal: Short-term (1) Spatial: Localised (2) Significance: high (3) Likelihood: May occur (3) Certainty: Probably	Health and Safety Officer will be placed on the site to make sure there is compliance in terms Construction Regulations 2014 (as mended)	Temporal: Short-term (1) Spatial: Localised (2) Significance: Low (1) Likelihood: Unlikely (1) Certainty: Possible
Ratings	=9	Ratings	=5

OPERATIONAL PHASE			
Potential impacts: Operational Phase	Significant rating of impacts	Proposed Mitigation Measures	Significant rating of impacts after mitigation
1. Topography			
Permanent structures: Slimes Dams, Tailings dumps, open pits Temporary structures: storage dam, stockpiles Visual impact Changes to drainage	Duration: Long-term (3) Spatial: site (1) Significance: High (3) Likelihood: Definitely (4) Certainty: Definite	<ul style="list-style-type: none"> • Do controlled dumping at the tailings dump facility. • Stabilise the mine residue deposits. • Employ effective rehabilitation strategies to restore surface topography of tailings dumps and plant site. • Pick up all tailing material up to natural ground level. • Stabilise underground workings. • All temporary infrastructures will be demolished during closure. 	Duration: Long-term (3) Spatial: Site (1) Significance: Moderate (2) Likelihood: May occur (2) Certainty: Possible
Rating	Collective Rating= 11	Rating	Collective Rating= 8
2. Soil Erosion			
Site clearing for the required footprint for mining may expose the surface layer.	Duration: Medium (2) Spatial: Site (1) Significance: Moderate (2)	Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.	Duration: Low(1) Spatial: Site (1) Significance: Moderate (2)

	<p>Likelihood: May occur (2)</p> <p>Certainty: Possible</p>	<ul style="list-style-type: none"> • The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion. • All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses. • The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers. • Ground exposure should be minimised in terms of the surface area and duration, wherever possible. • Stockpiles susceptible to wind erosion are to be covered during windy periods. • Excavated and stockpiled soil material are to be stored and berms on the higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate. • At no point may plant cover be removed within the no-development zones. • All attempts must be made to avoid exposure of dispersive soils. 	<p>Likelihood: May occur (2)</p> <p>Certainty: Possible</p>
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		<ul style="list-style-type: none"> • Audits must be carried out at regular intervals to identify areas where erosion is occurring. • Appropriate remedial action, including the rehabilitation of the eroded areas, must occur. • Rehabilitation of the erosion channels and gullies. • The mining operation should avoid steep slope 	
Ratings	Rating=7	Ratings	Rating =6
3. Culture/Heritage/Archaeology			
Grave disturbances and archaeological sites: Potential grave disturbances due to mining activities.	Duration: Medium term(2) Spatial: Site (1) Significance: Moderate (2) Likelihood: May occur (2) Certainty: Possible	All stone tool artefacts should be recorded, mapped and collected before destruction. <ul style="list-style-type: none"> • Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction. • The heritage and cultural resources if any are encountered (e.g. graveyards, ruins, historic structures, etc.) must be protected and preserved by the delineation of no-go zones. Stone tools should be avoided where possible and fresh exposure should be recorded before destruction.	Duration: short term (1) Spatial: Site (1) Significance: Low (1) Likelihood: May occur (2) Certainty: Possible

		<p>If during construction, any archaeological finds are made (e.g. stone tools, skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds.</p> <p>Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material and skeletal remains may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist (See National Heritage and Resources Act, 25 of 1999 section 36 (6)).</p> <p>Should the need arise to expand the development beyond the current scope demarcated area, the following applies:</p> <p>a qualified archaeologist must conduct a full Phase 1 assessment on the sections beyond the demarcated areas which will be affected by the expansion, in order to determine the occurrence and extent of any archaeological sites and the impact development might have on these sites.</p>	
Ratings	=7	Rating	=5
4. Fauna and Flora			

<p>Destruction of the natural habited</p> <p>Noise and vibration disturbance on game animals</p> <p>Alien invasion</p> <p>Game Poaching</p> <p>Fauna Fatality/Injuries caused operation vehicles/earthmoving plants</p> <p>Impacts on Animal species: Habitat destruction and sensitive species disturbance</p>	<p>Duration: Medium (2)</p> <p>Spatial: Site (1)</p> <p>Significance: Moderate (2)</p> <p>Likelihood: May occur (2)</p> <p>Certainty: Possible</p>	<p>Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining.</p> <p>It is recommended that these plants species be identified and marked prior to mining.</p> <p>Mining activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.</p> <p>These plants should, where possible, be incorporated into the design layout and left in situ.</p> <p>However, if threatened of destruction by mining, these plants should be removed (with the relevant permits from the relevant Competent Authority) and relocated If possible.</p> <p>A management plan should be implemented to ensure proper establishment of ex situ Individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.</p> <p>Encourage the growth of natural plant species.</p> <p>Ensure measures for the adherence to the speed limit.</p>	<p>Duration: Short (1)</p> <p>Spatial: Site (1)</p> <p>Significance: Moderate (2)</p> <p>Likelihood: May occur (2)</p> <p>Certainty: Possible</p>
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		<p>Minimise the footprint of transformation.</p> <p>Encourage proper rehabilitation of mined areas.</p> <p>All employees on site must be educated about the conservation importance of the fauna and flora occurring on site.</p> <p>24 hours security services should monitor and ensure safety within the farm property and also prevent poaching and killing of game animals.</p> <p>Regular maintenance of equipment, plants and mining vehicles is required to negate noise disturbance on game animal.</p> <p>Observe the breeding and hunting season and implement measures to mitigate disturbances.</p> <p>Mining operations must be suspended during hunting seasons or alternatively in consultation and agreement with the surface owner, operations must be scheduled for night shifts</p> <p>All hunting zone must be marked and marked with minimum mining operations.</p> <p>Mining stakeholders must keep hunting schedules and must be communicated to the mine management.</p>	
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		<p>A channel of communication must be enabled between the surface owners and the mine.</p> <p>Grievance platform must be established and be open to the landowners and the community at large.</p> <p>Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall mining footprint.</p> <p>The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.</p> <p>The ECO must ensure that all contractors and workers undergo Environmental induction prior to commencing with work on site.</p> <p>Speed limit of 40 km/hr will be enforced and be implemented.</p> <p>This is to prevent fatality or injuring of animals by construction vehicles and earthmoving plants</p> <p>Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.</p>	
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		<p>The environmental induction must be conducted in languages understandable to the workers who may require translation from English.</p> <p>The extent of the mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so.</p> <p>Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no-go zone for employees, machinery or even visitors.</p> <p>All personnel on site must be educated about the conservation importance of the fauna and flora occurring on site.</p> <p>To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees.</p>	
Ratings	=7	Ratings	=6
5. Ground Water			

<p>Refuelling of Machineries which may result in contamination of underground water when not done properly.</p> <p>Tailings</p> <p>Slime dam spills</p>	<p>Temporal: Mid-term (2)</p> <p>Spatial: Localised (2)</p> <p>Significance: High (3)</p> <p>Likelihood: Definitely (4)</p> <p>Certainty: Probable</p>	<p>Spill kits to clean up accidental spills from earthmoving machinery must be well marked and available on site.</p> <p>Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.</p> <p>Ground water monitoring system must be put in place.</p> <p>Monitoring of ground water level on monthly bases. Monthly ground water test must be done. Water recycling facility must be established.</p> <p>Water use records must be reconciled on daily and monthly bases.</p> <p>Slime dams must be desired in a manner that it prevent seepage and run off into underground water.</p> <p>Tailing storage facility must be desired in manner that there are no seepage and run off into underground water and other water bodies.</p>	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (2)</p> <p>Significance: Medium (2)</p> <p>Likelihood: May occur (2)</p> <p>Certainty: Probable</p>
<p>Ratings</p>	<p>= 11</p>	<p>Ratings</p>	<p>= 7</p>
<p>6. Surface Water</p>			
<p>There is no permanent surface water course such as river or stream.</p>	<p>Temporal: Short-term (1)</p>	<p>Infrastructure must be located away from water bodies.</p>	<p>Temporal: Short-term (1)</p>

	<p>Spatial: Site (1)</p> <p>Significance: Low (1)</p> <p>Likelihood: Improbable (1)</p> <p>Certainty: unsure</p>	<ul style="list-style-type: none"> • Fuel/diesel containers must be placed within a bund wall and far from any water course or body to prevent accident contamination. • Oil residue must be treated with oil absorbent and be disposed to an approved waste site. • Spill kits must be easily accessible and workers must undergo induction regarding the use thereof. • If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages. Wash bay area must be designated and used for that purpose under norms and standards. • At all times care should be taken not to contaminate surface water resources. • Store all litter carefully to prevent it from washing away or blown into any of the drainage channels the area. 	<p>Spatial: site (1)</p> <p>Significance: Low (1)</p> <p>Likelihood: Improbable (1)</p> <p>Certainty: unsure</p>
Rating	=4	Rating	=4
7. Air Quality			
<p>The source of air quality impacts are:</p> <ul style="list-style-type: none"> • Gases and fumes from vehicles; and 	<p>Temporal: Short-term (1)</p>	<p>Use of pre-blast environmental checklists, real-time weather monitoring data and stringent controls on blasts carried out in sensitive areas A no-blast arc is</p>	<p>Temporal: Short-term (1)</p>

<ul style="list-style-type: none"> • Fugitive dust emissions from vehicle traffic traversing gravel roads. • Soft Blasting <p>Neither pose significant health impacts, however fugitive dust emissions will pose a significant nuisance dust factor for the community living in close proximity to the proposed construction site</p>	<p>Spatial: Localised (2)</p> <p>Significance: Moderate (2)</p> <p>Likelihood: Unlikely (2)</p> <p>Certainty: Possible</p>	<p>automatically calculated for the nearest private residence based on the latest relevant weather conditions, including wind speed and direction, temperature inversions and amount of atmospheric turbulence (i.e. stability category) before the blast can be fired</p> <p>All operational vehicles should be regularly serviced and maintained to ensure minimal exhaust fume pollution.</p> <p>Exposed soils (i.e. soil stockpiles, gravel access roads, material laydown area) will be regularly watered to reduce wind-blown dust.</p> <p>Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for mining only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.</p> <p>Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.</p> <p>Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary</p>	<p>Spatial: Localised (2)</p> <p>Significance: Low (1)</p> <p>Likelihood: Unlikely (1)</p> <p>Certainty: Possible</p>
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		<p>traffic, speed control and avoidance of track-on of material onto paved and treated roads.</p> <p>The length of time where tailing reclamation areas are exposed should be restricted. Mining should not be delayed after vegetation has been cleared and topsoil removed where possible.</p> <p>Dust suppression methods should, where logistically possible, be implemented at all areas that may/are exposed for long periods of time.</p> <p>For all mining activities, management must undertake to implement health measures in terms of personal dust exposure, for all its employees.</p>	
Ratings	=7	Ratings	=7
8. Noise			
Noise: Increased ambient noise due to activities	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (2)</p> <p>Significance: Moderate (2)</p> <p>Likelihood: May occur (3)</p>	<p>A noise barrier in the form of a berm should be constructed on the boundary of the proposed opencast area as soon as possible, Barrier must be situated between the main noise source sensitive receivers which is mainly the nearby town.</p> <p>The berm will help with the attenuation of noise produced by the mining activities. A basic rule of thumb for barrier height is: Any noise barrier should be at least as tall as the</p>	<p>Temporal: Short-term (1)</p> <p>Spatial: Localised (2)</p> <p>Significance: Low (1)</p> <p>Likelihood: May occur (3)</p> <p>Certainty: Possible</p>

	<p>Certainty: Probably</p>	<p>line-of-sight between the noise source and the receiver, plus 30%. So if the line-of-sight is 10m high, then the barrier should be at least 13m tall for best performance.</p> <p>Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers.</p> <p>Switching off equipment when not in use.</p> <p>Fixed noise producing sources such as generators, pump stations and crushers to be either housed in enclosures or barriers put up around the noise source.</p> <p>Barriers should be installed between the noise source and sensitive noise receptor, as close to the noise source as possible.</p> <p>All project employees and contractors will be instructed to avoid the use of engine compression brakes when approaching the Mine entrance or driving through or in the vicinity.</p> <p>All access roads will be signposted and speed limited to minimise transport noise.</p> <p>Equipment with lower sound power levels would be used in preference to noisier equipment.</p> <p>All equipment used onsite will be regularly serviced to ensure the sound power levels</p>	
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		<p>remain at or below the levels used in the modelling to assess generated noise levels and compliance with the criteria.</p> <p>The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads.</p> <p>All the workers will be required to wear the appropriate Personal Protective Equipment (PPE) during the operational phase such as masks, protection glasses, ear plugs, gloves, safety boots, and overalls.</p> <p>Ensure that all workers have appropriate induction and safety training, and understand the dangers to which they will be exposed.</p> <p>Contractors should be appropriately trained as to safe working procedures prior to commencing with work.</p>	
Ratings	=8	Rating	=7
9. Aesthetic and Visual Impacts			
	<p>Duration: Short-term (1)</p> <p>Spatial: site (1)</p> <p>Significance: Low (1)</p>	<p>Dust from Stockpile areas, roads and other activities must be managed by means of dust suppression to prevent excessive dust.</p> <p>. Stockpiles should not exceed 15m in height.</p>	<p>Duration: Short-term (1)</p> <p>Spatial: Site (1)</p> <p>Significance: Low (1)</p>

	<p>Likelihood: Possible (2)</p> <p>Certainty: Possible</p>	<p>Rehabilitation of the area must be done as the mining is completed.</p> <p>The visual impact can be minimized by the creation of a visual barrier.</p> <p>The retention of as much existing vegetation as possible, specifically the existing mature trees in the area to conceal the mining activity as much as possible.</p> <p>Down-lighting should also be implemented to minimise light pollution at night.</p>	<p>Likelihood: Improbable (1)</p> <p>Certainty: Probable Improbable</p>
Ratings	=5	Rating	=4
10. Traffic and Road Safety			
<p>Increase traffic volumes along R64</p> <p>Impact on the R64 road</p> <p>Road Accidents</p> <p>Animal Fatality or Injuries</p> <p>Noise</p> <p>Dust</p>	<p>Duration: Long-term (3)</p> <p>Spatial: Regional (3)</p> <p>Significance: High (3)</p> <p>Likelihood: Highly probable (3)</p> <p>Certainty: Possible</p>	<ul style="list-style-type: none"> • Roads signs must be erected on or along the access road and internal roads. • Site sign rules must be placed at the entrance and must include speed limits • Warning signs must be placed on the road to alert traffic users to be on a look out for animal stray and crossing on the road. • Implement measures that ensure the adherence to traffic rules. • Maintenance of the roads must be done at all times to ensure safety for traffic users. 	<p>Duration: Mid-term (2)</p> <p>Spatial: Localised (2)</p> <p>Significance: Moderate (2)</p> <p>Likelihood: May occur (3)</p> <p>Certainty: Possible</p>

		<ul style="list-style-type: none"> Traffic assessment and Traffic management plan must be implemented in consultation with The Department of Police, Roads and Transportation. 	
Ratings	=12	Rating	=9
11. Socio-Economic			
<p>Impacts on Socio-Economic Environment: Creation of more employment opportunities.</p> <p>Impacts on the physical economic Environment: Damage to infrastructure on surrounding properties.</p> <p>Impacts on Socio-Economic Environment: Disruption of existing family system and negative impacts due to social interaction of mine workers with local community.</p> <p>Impacts on Socio-Economic Environment: Creation of more employment opportunities.</p>	<p>Duration: Long-term (3)</p> <p>Spatial: Localised (2)</p> <p>Significance: Very High (4)</p> <p>Likelihood: Definite (4)</p> <p>Certainty: Definite</p>	<p>Local community must be prioritised in terms of job opportunities and business opportunities.</p> <ul style="list-style-type: none"> Jobs must be allocated as advertised and in so far as is possible to local deserving residents. The mine must ensure that unrealistic expectations are not created regarding jobs and business opportunities. The mine must ensure as practically as possible to procure local goods and services from within the mine community (Boshof). The expectations of what benefits can accrue to the community must be managed from the initiation of the project A community Liaison Officer should be appointed and be responsible in dealing with the community and labour issues. Preferable the CLO should reside from the mine community. 	<p>Duration: Long-term (3)</p> <p>Spatial: Localised (2)</p> <p>Significance: Very High (4)</p> <p>Likelihood: Definite (4)</p> <p>Certainty: Definite</p>

		<ul style="list-style-type: none"> • Commitments as set out in the SLP must be implemented. <p>Surrounding land owners need to be notified well in advance of planned developments so that they are able to secure their property.</p> <p>An agreement needs to be deliberated on, accepted and signed by all parties on what action to take in the event of damage to property.</p> <p>An incidents report needs to be opened and maintained by the Environmental Control Officer at the site. This report will be used to record any complaints or incidences of damage to property.</p> <p>A code of conduct for the construction workers should be compiled and the information provided to and signed by all relevant stakeholders in order to provide guidance on what behaviour is or is not permitted and the consequences of disobedience.</p> <p>The development site must be fenced off to prevent trespassing.</p> <p>.Open fires for whatever purpose be it cooking or heating must be strictly prohibited at the construction/operation site and camp.</p>	
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		<p>Construction activities such as welding should be confined to designated areas and should be conducted during weather conditions that are not risky e.g. calm winds.</p> <p>Adequate and easily accessible firefighting equipment and a well-stocked tool shed must be maintained to enable repairs on damage property to be done without delay. In addition, a few workers should be trained on the proper use of the equipment.</p> <p>Labour (particularly semi-skilled and low skilled) and contractors should be sourced locally where possible and reasonable. This is because those from the local community already form a part of that society and there will be no added pressure on available local amenities such as housing.</p> <p>A monitoring forum should be formed consisting of community members so that the community can be briefed from time to time on the risks to the society's fabric as a result of the project.</p> <p>A code of conduct for the construction workers should be compiled, and the information provided to and signed by all relevant stakeholders in order to provide guidance on what behaviour is or is not permitted or acceptable.</p> <p>A HIV/AIDs, STDs awareness programme should be designed and the members of the community together with the workers</p>	
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		<p>should be regularly trained and road shows conducted on risky behaviour that could expose them to these diseases.</p> <p>The contractor / developer should plan and provide for transport, housing, weekend breaks of any workers who are brought in from outside the town.</p> <p>The development site must be fenced off to prevent trespassing.</p> <p>Labour (particularly semi-skilled and low skilled) and contractors should be sourced locally where possible and reasonable.</p> <p>Local construction personnel and contractors must be trained so that their skills may be developed for use in the future beyond the jobs at the mine.</p> <p>Local community members, authorities and organizations should be informed of job opportunities available and the procedures (if applicable) to be followed in order to secure the jobs.</p> <p>Women should be considered in the provision of jobs to ensure that the entire community benefits.</p> <p>The developer must compile a database of goods and services providers from the local community who comply with their procurement requirements before</p>	
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		commencement of the tender process for acquiring various services and goods.	
Ratings	=13	Rating	=13
12. Health and Safety			
Impacts on physical and psychological health: Reduced quality of life	<p>Duration: Short-term (3)</p> <p>Spatial: Localised (2)</p> <p>Significance: high (3)</p> <p>Likelihood: May occur (3)</p> <p>Certainty: Probably</p>	<p>Health and Safety Officer is to ensure compliance in terms Construction Regulations 2014 (as mended)</p> <p>Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction.</p> <p>All safety incidents must be reported to the appointed safety officer.</p> <p>Proper signage must be erected on the site and adjacent properties so that people are made aware of the activities and its dangers.</p> <p>Ablution facilities must be provided on site and should be regularly emptied by a licensed service provider. Workers should be informed that relieving of oneself in surrounding bushes is strictly prohibited.</p> <p>Speed limits that have been set at the site and surrounding areas must be strictly adhered to and harsh punishments set for offenders.</p> <p>The appointed contractor must ensure that any road damage caused by mine trucks is</p>	<p>Duration: Short-term (3)</p> <p>Spatial: Localised (2)</p> <p>Significance: high (3)</p> <p>Likelihood: May occur (3)</p> <p>Certainty: Probably</p>

		<p>swiftly repaired to ensure safety of all road users.</p> <p>Dust suppression measures must be implemented to reduce the amount of dust released into the air. Such measures include using water bowsers to periodically spray the site especially during dry weather conditions. In addition, trucks transporting spoil material or top soil from the site must be covered to prevent loss of material while in transit.</p> <p>Equipment and trucks that produce loud noise must be fitted with appropriate silencers where possible.</p> <p>Workers on site must be trained on the correct handling of spillages and precautionary measures that need to be implemented to minimize potential spillages.</p> <p>Workers must be provided with spill kits and spills must be cleaned up immediately.</p> <p>General and hazardous waste disposal bins must be provided at various strategic locations on the site.</p> <p>An Environmental Control Officer (ECO) must be appointed to monitor that measures prescribed for noise, dust, and water resources protection are adhered to.</p> <p>A system needs to be put in place at the local health centres to monitor any changes</p>	
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		<p>in diseases particularly respiratory or those associated with Contaminated water such as dysentery, typhoid etc.</p> <p>Ground water, surface water, air quality, and noise monitoring system must be implemented to ensure that levels prescribed are complied and if not, urgent measures are taken to correct the situation.</p>	
Ratings	=11	Ratings	=11
13. Land Capability			
<p>Soil contamination: Changes in Soil's physical, chemical and biological properties.</p>	<p>Duration: Mid-term (2)</p> <p>Spatial: Site (1)</p> <p>Significance: Medium (2)</p> <p>Likelihood: May occur (3)</p> <p>Certainty: Possible</p>	<p>The soil map compiled should be considered and mitigation measures on soil management implemented.</p> <p>The excavator should only operate on the topsoil layer.</p> <p>Implementation of a bed/strip system avoids the need for trucks to travel on the soil layers.</p> <p>Machines are to only work when ground conditions enable their maximum operating efficiency.</p> <p>If compaction is caused, then measures are required to treat (consult an experienced specialist).</p> <p>it is recommended that the topsoil be stripped and stockpiled in advance of</p>	<p>Duration: Short-term (1)</p> <p>Spatial: Site (1)</p> <p>Significance: Low (1)</p> <p>Likelihood: Possible (2)</p> <p>Certainty: Possible</p>

		<p>construction activities that might contaminate the soil.</p> <p>The stripped soils should be stockpiled upslope of areas of disturbance to prevent contamination of stockpiled soils by dirty runoff or seepage.</p>	
Rating	=8	Rating	=5

5.ENVIRONMENTAL MONITORING

5.1. Site inspection

Environmental monitoring and evaluation will be undertaken during the construction phase and operation phases to ensure the effectiveness of mitigation measures, to determine the accuracy of impacts predicted and to respond to unanticipated environmental concerns at an early stage in order to adopt appropriate remedial measures.

The purposes of the environmental monitoring plan are: To evaluate the effectiveness of mitigation measures; respond in timely manner to anticipated environmental impact when the project is under construction and provide supporting information for formulating regulations and improving traffic management and environmental control based on monitoring data. To conduct environmental audits and report to the client; contractor and engineer and attend the site meetings.

a. Environmental awareness and training

The environmental manager will be required to ensure that awareness posters and relevant contact details are visibly displayed on the site. Regular toolbox talks and training must take place to ensure that environmental awareness is raised amongst all staff members. Other environmental awareness methods may also be implemented, e.g. presentations, demonstrations, etc.

b. Record keeping

It is important that certain documentation is kept by the environmental office on the site premises. These documents include the following:

- Method statements; and General environmental documentation.

c. Method statements

Method statements will be required to be prepared by the contractor and approved, in consultation with the ECO, by the environmental manager for the following work, prior to the commencement of the specific activity: Camp establishment; Access roads; Cement and concrete batching; Dust control;

Bunding; Fuels and fuel spills; Fire, hazardous and poisonous substances; Solid and liquid waste management; Storm water controls; Source of materials; Emergency response; Vegetation clearing; Erosion control; Wash areas; Exposed aggregate finishes; Impeding or diverting the flow of water in a watercourse; Altering the bed, banks, course or characteristics of a watercourse.

The method statements should be stored on file at the construction site and they should be updated as and when required. Each of the method statements must contain information basic aspects.

6.CONCLUSION

This EMP is ensuring that impacts associated with the upgrading phase two of the project are kept to a minimum level. This EMP has been prepared as “stand alone” document to be used as the basis for actively managing the activities as projects progress. This document outlines the overarching performance criteria, control strategies and corrective actions proposed accordingly. On balance, the benefits of the potential positive project impacts for the local community and beyond, namely vegetation conservation and protection of endangered species; scenery improved and cost savings to the facility users, are considered to outweigh the disadvantages of the potential minimum negative impacts.