



**Prospecting Right & Integrated Environmental Authorisation
Application Process for the Proposed Prospecting Activities,
associated Infrastructure and Processes near Kuruman, JTG
District Municipality, Northern Cape
NC 30/5/1/1/2/13444 PR**

**Environmental Impact
Assessment Report**

**Prepared for:
Yone STEM Frontiers (Pty) Ltd**



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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PROSPECTING RIGHT APPLICATION (WITH BULK SAMPLING) IN TERMS OF SECTIONS 16 AND 20 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT NO. 28 OF 2002) AS AMENDED BY SECTION 12 OF ACT 49 OF 2008; FOR AGGREGATE, GEMSTONE, DIAMONDS (ALLUVIAL, GENERAL & IN KIMBERLITE), MANGANESE AND IRON ORES AND ASSOCIATED AND / OR RELATED INFRASTRUCTURE, PROCESSES, ACTIVITIES AND EQUIPMENT ON PORTION 20 OF FARM MAMATWAN NO. 331, NEAR KURUMAN, JOHN TAOLO GAETSEWE DISTRICT, NORTHERN CAPE.

FOR COMMENT

SUBMITTED FOR INTEGRATED ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

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CLIENT APPROVED

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/13444 PR

(i) IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

(ii) Acronyms

AEL	Atmospheric Emission License
AQMP	Air Quality Management Plan
BAR	Basic Assessment Report
B-BBEE	Broad-Based Black Economic Empowerment
BPG	Best Practice Guideline
CA	Competent Authority
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
COMSA	Chamber of Mines South Africa
CPA	Communal Property Association
CRR	Comments and Responses Report
DEFF	Department of Environment, Forestry and Fisheries
DENC	Department of Environment and Nature Conservation
DARDLR	Department of Agriculture, Rural Development and Land Reform
DMRE	Department of Mineral Resources and Energy
DMR	Department of Mineral Resources
DSR	Draft Scoping Report
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
DWAF	Department of Water Affairs and Forestry
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC	Electrical Conductivity
ECO	Environmental Control Officer
EI	Ecological Importance
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EMS	Environmental Management System
ES	Ecological Sensitivity
ESMS	Environmental and Social Management System
FIER	Final Environmental Impact Report

FEPA	Freshwater Ecosystem Priority Areas
FSR	Final Scoping Report
GDP	Gross Domestic Product
GN	Government Notice
Ha	Hectares
HDPE	High Density Polyethylene
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
IEMPr	Integrated Environmental Management Programme
ISO	International Organisation for Standardisation
IWRM	Integrated Water Resources Management
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MPRDA	Mineral and Petroleum Resources Development, 2002 (Act No. 28 of 2002)
MR	Mining Right
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NCDAEARDLR	Northern Cape: Department of Agriculture, Environmental Affairs, Rural Development and Land Reform
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998) [as amended]
NWRS	National Water Resource Strategy
PCO	Pest Control Officer
PES	Present Ecological Status
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 µm
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 µm
PPP	Public Participation Process
RWD	Return water dam
SABS	South African Bureau of Standards

SACNASP	South African Council for National Scientific Professions
SAHRA	South African Heritage Resources Agency
SANAS	South African National Accreditation System
SANBI	South African National Biodiversity Institute
SANS	South African National Standard
SAWQG	South African Water Quality Guidelines
SDF	Spatial Development Framework
S&EIR	Scoping and Environmental Impact Report
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environment and Quality
SIA	Social Impact Assessment
SR	Scoping Report
TDS	Total Dissolved Salts
TOPS	Threatened or Protected Areas
ToR	Terms of Reference
TSS	Total Suspended Solids
VOC	Volatile Organic Compound
WARMS	Water Authorisation Registration and Management System
WCDM	Water Conservation and Demand Management
WESSA	Wildlife and Environmental Society of South Africa
WMA	Water Management Area
WMP	Waste Management Plan
WRC	Water Research Commission
WUL	Water Use License

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(iii) Objective of the Environmental Impact Assessment process

The objective of the environmental impact assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the [preferred location] development footprint on the approved site as contemplated in the accepted scoping report;
- (c) identify the location of the development footprint within the [preferred] approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) determine the—
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the [preferred] development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the [preferred location] development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
- (g) identify suitable measures to avoid, manage or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

(iv) PART A
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1 Introduction

Environmental Impact Assessment (EIA) plays a vital role in informing prospecting right applicants of sustainable methods of practising mining at all stages of the process. If properly implemented, Environmental Impact Assessments assist in ensuring optimal use of available resources, productivity increase and sustainability among other things.

It is important to take note that South Africa is a developing country within a global space where environmental impacts may not be ignored any longer. There is a need for sustainable development and the need for sustainable development in a State such as South Africa is accompanied by numerous obligations, which include developing the economy and protecting the environment.

In an attempt to protect the environment through impact management in many ways, the international community has entered into agreements and treaties in order to address matters relating to impacts associated with development among others. Consequently, South Africa is a signatory to numerous international treaties, and among those is the Paris Agreement on Climate Change. In order to meet the objectives of the Paris Agreement, South Africa is currently promoting renewable energy generation and innovative mining practices among other things.

The economy of South Africa relies largely on both mining and agriculture. The Northern Cape Province, which is the province in question in this regard and instance, relies on both mining and agriculture among other things. However, the province is relatively dry with high evaporation rate and this factor results in the reduced availability of surface water resources in the Northern Cape Province. Thus, the assessment will take into consideration all relevant legislation and factors into account.

1.1 Background

Yone STEM Frontiers (Pty) Ltd proposes to prospect for diamonds, iron, and manganese ores, as well as associated / related infrastructure, activities, processes, and equipment, on the property near Kuruman, John Taolo Gaetsewe District, Northern Cape, South Africa.

In the case of proposed mineral resource development, an Environmental Impact Assessment must be conducted and such study will take into account all relevant factors in order to assess the potential impacts of the proposed development against the triple-bottom-line of social, economic, and environmental consequences, with the view to promote sustainable development.

It is of vitality to take note that sustainable development is a framework for reconciling socio-economic development and environmental protection. The constitutional framework is as follows:

- The Bill of Rights (section 24(b) of the Constitution) acknowledges sustainable development. The government is required by this section to give effect to this right through reasonable legislative and other measures.
- The Constitution also includes a provision for cooperative governance, which makes it easier to implement sustainable development. Environmental policy is formed on the basis of sustainable development.

The legislative framework is as follows:

- Sustainable Development is stated as an overarching goal in the White Paper on Environmental Policy.
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended, is the environmental framework legislation that contains uniform norms and standards that apply to all environmental legislation. Sustainable Development is one of these standards. The NEMA defines Sustainable Development as "the integration of social, economic and environmental factors into planning, implementation and decision-making to ensure that development serves present and future generations". Many of the NEMA's principles and objectives for environmental management are based on sustainable development. The NEMA also establishes the framework for environmental legislation compliance and enforcement. Sustainable development is addressed in environmental legislation (e.g., the National Water Act, 1998 (Act No. 36 of 1998), the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000)).

In order to facilitate cooperative environmental governance, the proposed development necessitates the implementation of procedures and mechanisms. Such procedures are covered in Chapter 3 of the NEMA. The NEMA provides for environmental implementation and management plans in Section 11. Every

national department on Schedule 2 is required to develop an environmental management plan. Provinces and departments must go above and beyond to ensure that these environmental implementation or management plans are consistent. These plans' purpose and objectives are as follows:

- to coordinate and harmonise the environmental policies, plans, programmes and decisions of the various listed national departments and of provincial and local spheres of government, which must be done to minimise the duplication of procedures and functions and to promote consistency;
- give effect to the principle of cooperative government in Chapter 3 of the Constitution;
- secure the protection of the environment across the country as a whole;
- prevent unreasonable actions by provinces in respect of the environment, which actions are prejudicial to the economic or health interests of other provinces or the country as a whole; and
- enable the Minister to monitor the achievement, promotion and protection of a sustainable environment.

2 Details and Expertise Environmental Impact Assessment Practitioner who prepared the report

The particulars of the EAP(s) involved in this study are presented in Table 1.

Table 1: Details of the EAP

Name of Consultancy:	Abantu Environmental Consultants (Pty) Ltd
Name of EAP	Sive Mlamla
Physical Address	533 Masincedane Keiskammahoek 5670
Contact Number:	078 207 8278
E-mail	mining@abantuenvironmental.co.za
Contact Person:	
Title	Prospecting Right and Integrated Environmental Authorisation Application Process for Aggregate, Gemstone, Diamonds (Alluvial, General & in Kimberlite), Manganese and Iron Ores, near Kuruman, John Taolo Gaetsewe District, Northern Cape, South Africa.
Experience:	<p>More than seven (7)</p> <p>Sive is the Director of Abantu Environmental Consultants. He completed an M. Sc. degree in Geography (Catchment Hydrological Modelling using GIS and Remote Sensing) at Nelson Mandela University. Currently, he is a Ph. D Candidate in Remote Sensing and GIS at Nelson Mandela University.</p> <p>Sive is a registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa. He is also registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions. Additionally, Sive is registered with the following bodies:</p> <ul style="list-style-type: none"> • Institute of Waste Management of Southern Africa; • Southern African Wetlands Society; • International Association of Hydrological Sciences; and • Southern African Association of Geomorphologists. <p>He has been involved in EIAs for more than seven (7) years.</p>

3 The location of the activity, including-

3.1 The 21-digit Surveyor General code of each cadastral and land parcel

Information pertaining to the proposed project is presented in Table 2.

Table 2: Property Information

Farm Name:	Farm Mamatwan No. 331 (Portion 20), within the Administrative District of Kuruman, John Taolo Gaetsewe, Northern Cape, South Africa.
Application area (Ha)	Approximately 200 Ha
Magisterial district:	Kuruman, John Taolo Gaetsewe, Northern Cape
Distance and direction from nearest town	The application area is situated approximately 25 km Southeast of Hotazel, approximately 37 km North of Kathu and about 45 km Northwest of Kuruman, Northern Cape, South Africa.
21-digit Surveyor General Code for each farm portion	C0410000000033100020

3.2 where available, the physical address and farm name

Please refer to section 3.1. or 3.3.

3.3 where the required information on 3.1 and 3.2 is not available, the coordinates of the boundary of the properties

The GPS co-ordinates in relation to the proposed development are presented in Table 3.

Table 3: GPS Co-ordinates

Latitude	Longitude
-27.380400	22.935470
-27.373926	22.942092
-27.385625	22.954537
-27.394046	22.947542

4 a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is –

The proposed Project is located (Figure 1) within an area whose zoning has not been requested for at the moment. The area of application is not located within a protected area and is therefore relatively less threatened. The findings of the proposed Biodiversity Assessment, if any, to be conducted will provide guidance of what trees are protected within the application area

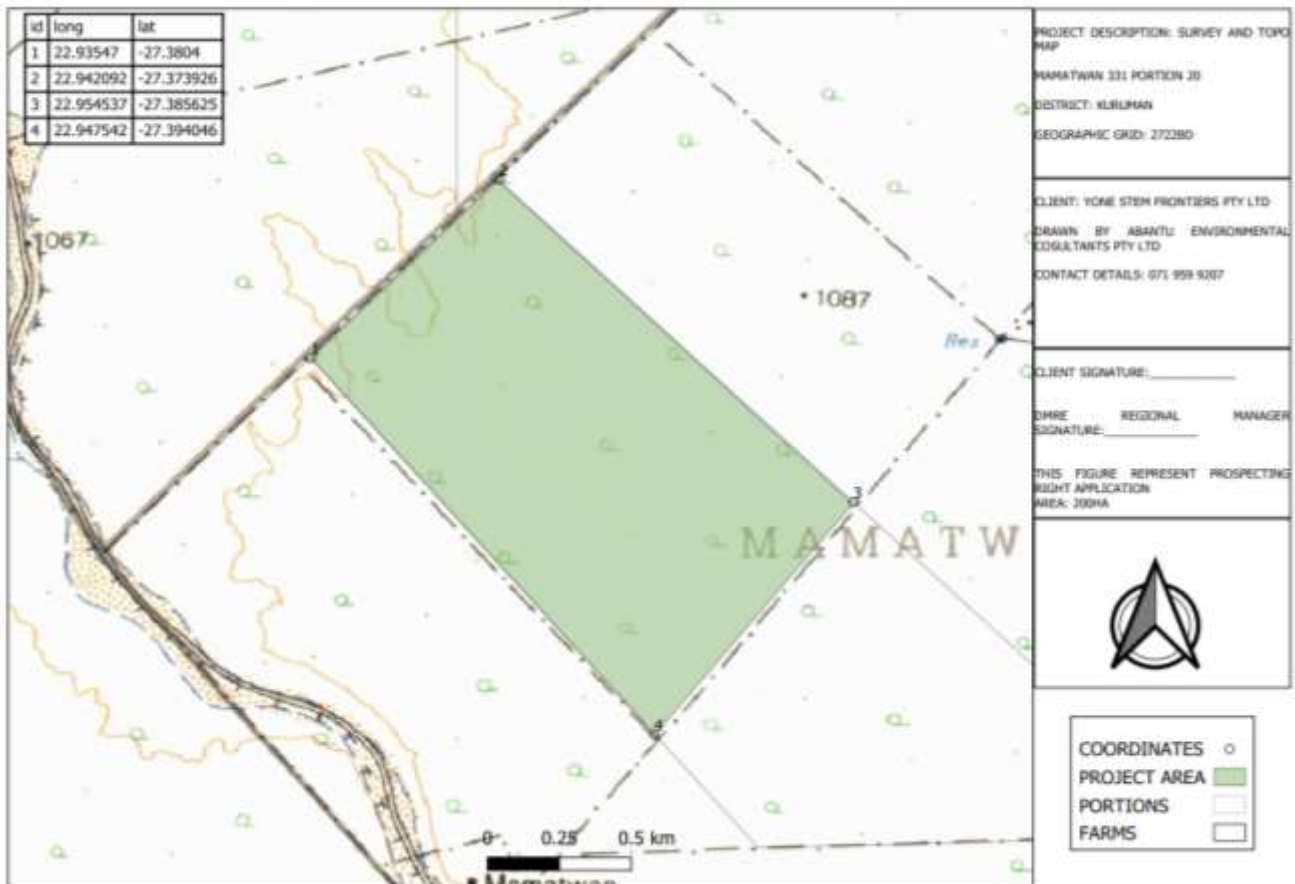


Figure 1: Project Application Area

Locality of the proposed development is depicted in Figures 1 and 2.

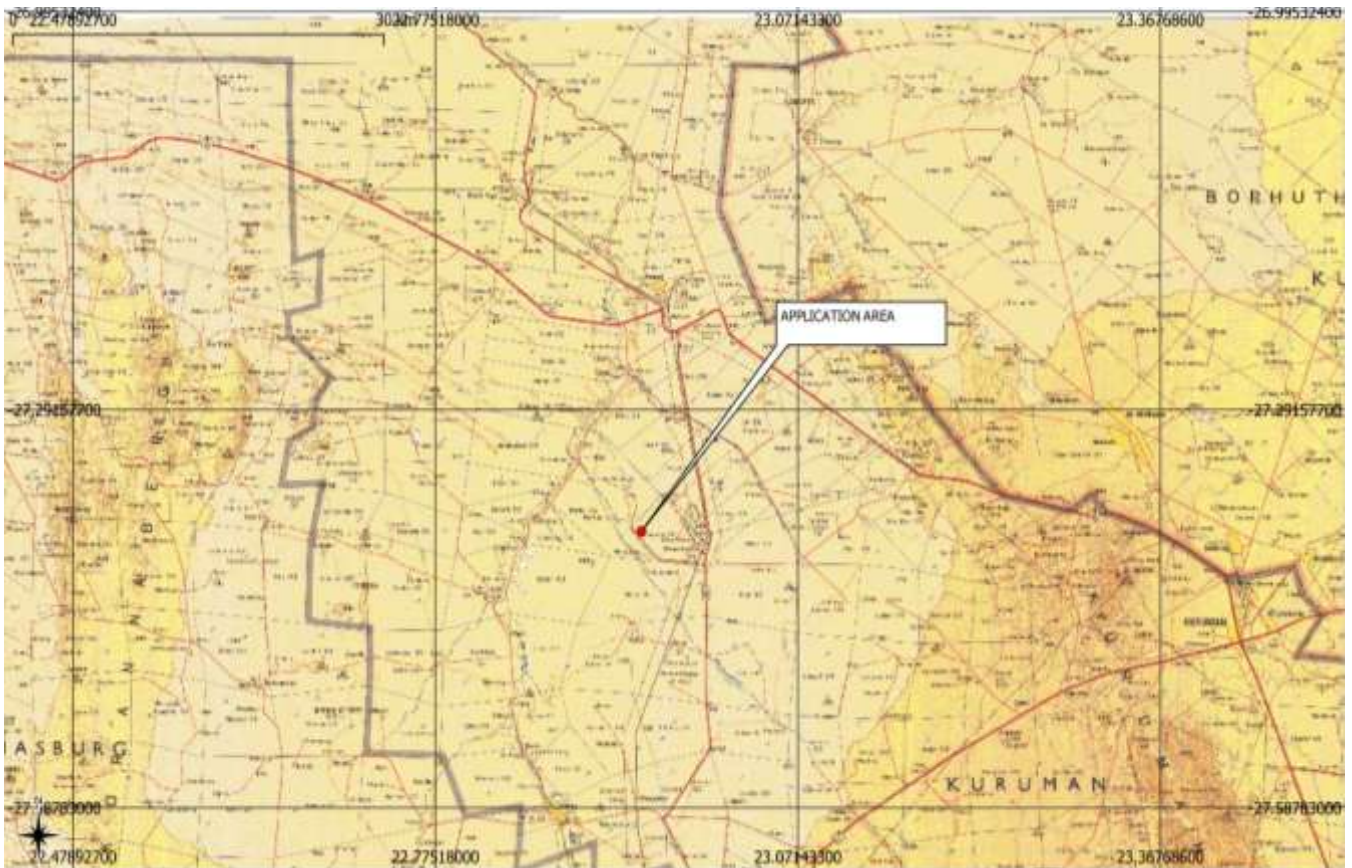


Figure 2: Locality Map of John Taolo Gaetsewe District

4.1 A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or

Activities are going to be undertaken on the Prospecting Right application area Farm Mamatwan No. 331, near Kuruman, Northern Cape.

4.2 On land where the property has not been defined, the coordinates within which the activity is to be undertaken

Please refer to section 3.

5 A description of the scope of proposed activity, including –

5.1 All listed and specified activities triggered

The listed and specified activities potentially triggered by the proposed prospecting for mineral resources development are indicated in Table 4.

Table 4: Listed and Specified Activities

NAME OF ACTIVITY E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 324, GNR 325 or GNR 326)
The extraction, removal and disposal of minerals that is envisaged in terms of Section 20 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) ("Act"), including affected infrastructure, structures and earthworks, directly related to prospecting of a mineral resource and activities for which an exemption has been issued in terms of Section 106 of the Act. Activity 19 of Listing Notice 2	900 Ha - Only the area where prospecting activities are going to take place will be cleared of indigenous vegetation. Concurrent or Progressive rehabilitation will be conducted with normal backfilling.	X	GNR 325 Listing Activity 19
All activities, including the operation of a particular activity associated with primary processing of a mineral resource such as extraction, classifying, reduction, concentrating, winning, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case Activity 6 of this Notice applies. Activity 21 of Listing Notice 2	0.96 Ha	X	GNR 325 Listing Activity 21
Clearance of indigenous vegetation	900 Ha - Only the area where prospecting activities are going to take place will be cleared of indigenous vegetation. Concurrent or progressive rehabilitation will be conducted with normal backfilling.	X	GNR. 325, Listing Activity 15
Temporary structures (3 x Park Homes)	0.215 ha		GNR 325, Listed 1, Activity 21
Temporary Dump Site	0.19 ha		GNR 325, Listed 1, Activity 21
Residue Dam	0.5 ha		GNR 325, Listed 1, Activity 21
Concrete spillage control at diesel bousers	100 m ²		Not listed
Oil storage facility	100 m ²		GNR 325, Listed 1, Activity 21

NAME OF ACTIVITY E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 324, GNR 325 or GNR 326)
Water pipeline of undetermined length but less than 10 Km	≈2 km		GNR 325, Listed 1, Activity 21
Roads to trenches and processing plant and not wider than 4 m.	+- 1 km		GNR 325, Listed 1, Activity 21
Stockpiling of topsoil	900 Ha – 6m X 6m X 1 000m pit (100 trenches) 200m X 100m X 200m trench (5 pits) 1 000m drill holes		GNR 325, Listed 1, Activity 21
Handling of General Waste (The waste licensing process for listed activities under Schedule 1 in the National Environment Management Waste Act 2008 is as defined in the environmental impact assessment (EIA) regulations made under section 24(5) of the National Environment Management Act 2008 (NEMA) No. 107 of 1998. This is a Category A Waste License Application for listed activities under Schedule 1 in the National Environment Management Waste Act 2008.)	0.0008 Ha	X	NEM:WA - Government Notice Regulation 921 – 29 November 2013, as amended,
The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;	Approx. 2 km	X	Listing Notice GNR 327, Activity 9
The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;	Approx. 2 km	X	Listing Notice GNR 327, Activity 10

NAME OF ACTIVITY E.g. for mining ,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 324, GNR 325 or GNR 326)
The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	<500 m ³	X	Listing Notice GNR 327, Activity 14
Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource[.] ; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource...	Approx. 6 043.918 Ha	X	Listing Notice GNR 327, Activity 20
The development of a road— (i) [a road] for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) [a road] with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	Access roads and internal road network.	X	Listing Notice GNR 327, Activity 24
The decommissioning of any activity requiring - (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or (ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.	Obtain closure certificate after prospecting activities have been completed, if necessary.	X	Listing Notice GNR 327, Activity 22

NAME OF ACTIVITY E.g. for mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 324, GNR 325 or GNR 326)
The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure— (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1 000 metres in length...	≈1 km	X	Listing Notice GNR 327, Activity 45
The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.			Listing Notice GNR 327, Activity 47
The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	>300 m ²	X	Listing Notice GNR 324, Activity 12
The storage of general waste in lagoons.		X	Category A(1)
The recovery of waste including the refining, utilisation, or co-processing of waste in excess of 10 tons but less than 100 tons of general waste per day or in excess of 500kg but less than 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.	<100 tons of general waste. <1 ton of hazardous waste.	X	Category A(5)
The remediation of contaminated land		X	Category A(8)
The disposal of inert waste to land in excess of 25 tons but not exceeding 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.	<25 000 tons	X	Category A(9)
The construction of a facility for a waste management activity listed in Category A of this Schedule	<25 000 tons	X	Category A(12)
The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).		X	Category A(15)
The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage.		X	Category B(1)
The treatment of hazardous waste in lagoons, excluding the treatment of effluent, wastewater or sewage.		X	Category B(5)
The construction of a facility for a waste management activity listed in Category B of this Schedule.		X	Category B(10)

National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) - Government Notice Regulation 921 – 29 November 2013; Category A(1), A(5), A(8), A(9), A(12), A(15); Category B(1), B(5) and B(10).

National Water Act, 1998 (Act No. 36 of 1998) – section 21(a): Taking water from a water resource and section 21(b): Storing water, section 21(c): Impeding or diverting the flow of water in a watercourse, section 21(i): Altering the bed, banks, course or characteristics of a watercourse; section 21(e): engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1); section 21(g): disposing of waste in a manner which may detrimentally impact on a water resource; section 21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.

5.2 A description of the activities to be undertaken, including associated structures and infrastructure

In accordance with the National Environmental Management Act of 1998 (Act No. 107 of 1998) and the National Environmental Management: Waste Act of 2008, Yone STEM Frontiers (Pty) Ltd submitted applications to the Department of Mineral Resources and Energy for a prospecting right under the Mineral and Petroleum Resources Development Act of 2002 (Act No. 28 of 2002) and an Integrated Environmental Authorization (Act No. 59 of 2008). As a result of the MPRDA application being accepted, the Environmental Impact Assessment (EIA) process has begun. This work (Scoping Report) is compiled and made available to the public as part of the first phase of the EIA process to look into the potential environmental effects of the proposed development.

In addition, and according to the National Water Act of 1998 (Act No. 36 of 1998) an Integrated Water Use License Application must be filed with the Department of Human Settlements, Water Sanitation (DHSWS) in order to support the proposed development and related processes. An on-site water abstraction from the ground is envisaged by the project team.

It is also advised that both the Responsible Authority (DHSWS) and the Competent Authority (DMRE) will be consulted in the event that an alternative arrangement is formed to the one that was originally planned.

5.2.1 Description of Planned Non-Invasive Activities

The application area will be geologically mapped using high resolution satellite imagery. A special focus will be placed on defining and delineating the areas underlain by alluvial gravels or Kimberlites, manganese, and iron ore and contacts between different lithologies will be mapped.

The target areas will undergo a site analysis to identify infrastructure and identify any potential issues that may need to be addressed.

Analytical Desktop Study

The project geologist monitors the program, compiles and processes the data, and modifies the program as needed in response to the results. Even when there is no prospecting being done on the ground, this process is ongoing throughout the program.

Following each physical stage of prospecting, desk studies are conducted that involve the interpretation and modelling of all the data gathered. These studies will determine the activity, quantity, resources, expenditure, and duration of the task programmed and all the exploration data will be gathered in a GIS-based database.

5.2.2 Description of Planned Invasive Activities

During the initial stages of the planned project, Drilling, Pitting and Trenching are going to be undertaken.

The proposed development is going to follow a stepwise process. Pitting should take place only after results have been obtained from drilling exercise undertaken. This forms part of the Environmental Impact Assessment Report to be submitted to the Department of Mineral Resources and Energy. After the right is obtained, if issued, the planned site visit will be undertaken. The developer must conduct desktop studies to locate target areas and the area for mobile and / or immobile infrastructure to be built and to identify potential risks. At Operational Phase, the proponent must use of drill rigs to drill for ore body, gravel and to determine the quality of the minerals, gravel, iron and manganese ores (with a maximum of six (6) drillholes at a time, with concurrent or progressive rehabilitation, thereafter, another six drillholes). Percussion drilling is going to be undertaken. If a need arises, geological core boreholes will be drilled over the prospecting area. All borehole cores will be logged and the potentially viable seam intersections sent for initial raw analysis to determine value. If the quality of the Iron and manganese ore seams warrant further investigation, washability analysis of the ore seams will be undertaken. All geological prospecting

boreholes will be surveyed and plotted on the base plan. Any other right holder on the study area or in the vicinity thereof may be notified of the results obtained from this process, if applicable. Appropriate equipment and prospecting methods must be utilized in order to promote sustainable development. Furthermore, the proponent must determine quality and quantity ore. A geomagnetic survey may be undertaken to determine the presence of igneous intrusions. This survey will consist of traverses using a hand-held magnetometer. A GPS will be used to record the data point locations. Boreholes will be drilled at pre-determined sites on the property. A 60mm diameter (min.) core drill will be used to drill the geological boreholes. The time required is less than 48 months to complete all core drilling and rehabilitation of the core drilled holes. The cored boreholes will be drilled to the base of the Dwyka sediments among others, if applicable. All boreholes will be logged with descriptions of all layers intersected. All the commodities, Iron and Manganese ore seams intersected will be sampled and analyzed to determine the grade of the ore. A geological report will be compiled accordingly in respect of the commodities, Iron and Manganese ore resources in accordance with SAMREC Code. Small diameter borehole core drilling enables the evaluation of both the physical continuity of the Iron ore seam(s) and the quality continuity of the Iron and Manganese ores. The borehole core data shall be used for structural evaluation, ore seam correlation, ore quality analyses and geotechnical evaluation. For adequate sample volume, the borehole core diameter shall be not less than 60 mm in diameter in the case of Iron and Manganese ore samples submitted for washability analysis. A minimum borehole core diameter of 49 mm is acceptable for Iron ore samples for washability and raw proximate analyses.

For reliable Iron and Manganese ore resource evaluation the core recovery shall be in excess of 95 % within the Iron and Manganese ore seam and all core recovery information shall be properly documented. The spacing of small diameter borehole core holes for geological studies depends on the Iron and Manganese ore deposit type, whether thick interbedded seam or multiple seam deposit types. The spacing between boreholes shall be decreased appropriately where significant Manganese and Iron ore quality changes occur in structurally complex areas and along the ore seam sub-outcrop.

5.2.2.1 Site preparation

Site clearance – site is going to be cleared of some vegetation and leveled. Firebreaks are also going to be prepared.

Topsoil removal – minimal topsoil is going to be removed and piled adjacent to point of removal.

Water supply – water is going to be supplied using water cart or any other authorized water use for purposes of drilling, sampling, processing (if applicable).

5.2.2.2 Rig / Drill preparation

Percussion drilling may take place. Also, diamond core drilling is recommended. Top of hole lined with steel casing to suitable depth, if required. Carbon footprint is minimized during this process.

Mobile ablution and camping facilities are going to be utilized. Lockable facilities for hazardous substances and bunded areas for small scale maintenance will be provided. Small sumps (about 0.25 m³ in volume) will be excavated. These sumps may be utilized to recycle water used during the drilling process. The drill area is going to be cordoned off with barricade tape and labelled with appropriate signage as a measure to control access.

5.2.2.3 Drilling

Core drilling is going to commence. This process uses water for cooling, using diesel engine as a power source, with an estimated usage of about 500 litres per session.

Core material is removed as the drilling progresses, sampling is conducted and samples are removed from site and sent to the Laboratory for analysis. The core material is kept for future reference.

5.2.2.4 Decommissioning and Rehabilitation

Upon completion of the drilling process, the drill rig and hydrocarbon containers are going to be removed from site.

The water used during the drilling process is going to be pumped into a waste water tanker and disposed of on an approved site.

The sumps, if any, are going to be backfilled and compacted.

All mobile machinery is going to be taken off site.

All barricades are going to be removed.

All disturbed areas (including roads) are ripped and allowed to return to the natural state. Seeding is not going to be undertaken at this small scale as experience has shown that the natural process returns the site to its former state within a seasonal cycle. In an event this does not happen, the disturbed area will be seeded.

Ablution facilities are going to be used for doing laundry and washing of body. Mobile toilets are going to be serviced by the local supplier. Waste disposal is going to be conducted at an authorized facility.

5.2.2.5 Monitoring

Monitoring of site is going to be undertaken on a quarterly basis to ensure returning of site to reasonably practicable state.

5.2.2.6 Geophysical Survey

A handheld proton Magnetometer will be used to undertake the Geophysical survey. Readings will be taken every 20 meters (minimum) along traverse lines. A base station will be used to record any changes in the earth magnetic field during the field survey.

Field data will be obtained based on the principles and guidelines as outlined in the Geophysical Field Manual for technicians – the Magnetic Method, SAGA.

Extrapolated baseline data will be obtained from the available geological data on the surrounding farms. This data will be incorporated with the geophysical survey and form the basis for the drilling phase. A geological report will be compiled stating the Iron and Manganese ore resources in accordance with the SAMREC Code.

5.2.2.7 Data collection from drilling programme

The recovered core will be described geologically in respect of the lithological horizons intersected and the Iron ore seam cores will be described and sampled in economic units according to the recognisable Iron ore horizons that may be present in the intersections.

The sampled core will be analysed at the Laboratory, an established and accredited Iron ore laboratory for the following:

- Raw Iron ore analysis - Proximate, CV and Sulphur
 - Each sample will be analyzed for Moisture, CV etc.
- Further specialized analysis may be required such as:
 - Ash fusion temperature;
 - Abrasive index;
 - Hardgrove Grindability Index;
 - Ash analysis;
 - Ultimate analysis.

5.2.2.8 Data processing

The first, second and third phase data collection in this manner will be structured by the technical consultants and then processed and modeled electronically, together with results obtained from the non-invasive activities. A set of geological data will be produced at this stage.

It will be utilized to calculate the resource quantity, qualities and to model the conceptual mining program.

The economic studies required to determine the feasibility of the project will be carried out and the feasibility study finalized.

If the study proves to be feasible, the applicant will proceed with the Mining Right Application.

5.2.2.9 Bulk sampling as a sampling technique

Bulk sampling may include undertaking prospecting activities utilising movable or mobile equipment, infrastructure, machinery and tools. During prospecting activities, mineral resources may be processed both on site and out of site. Noteworthy, economically viable and environmentally-friendly are going to be utilised during prospecting activities. Progressive or concurrent rehabilitation is going to be implemented throughout all phases of the proposed development.

Volumes of the mineral to be tested

The method of sampling known as bulk sampling involves taking volumes of the mineral that will be tested. About five pits will be dug with the dimensions shown in Table 2 to see if there are any commodities of interest underground. Before getting to the ore body, which is expected to contain diamonds, manganese, and iron ores, an average of 3 to 70 meters of overburden—calcrete, dolomite, waste rock, and soil—will need to be removed. The trenches will be 200 meters wide by 100 meters deep. We estimated the volume of gravel on 50 meters, and if all five pits are dug, an average of 1,000,000 m³ will be tested in each pit.

Why will they be tested?

There will be tests on the iron and manganese ore. An analytical laboratory will be used for the testing. A grade (carats per hundred tonnes) and value (US dollars per carat) for the kimberlitic material and diamondiferous gravels will be determined by testing. To treat the material, the adjacent iron and manganese ore mines as well as the diamond mines might be used. The applicant may also need to use a processing plant that will be built on the property.

Where will they be tested?

Whether done on-site or off-site, all bulk sampling operations. A description of the procedure is provided below: -

The planned bulk sample method is similar to normal South African operations for iron, manganese, and diamond ore and may need to incorporate kimberlite mining. The exploration approach that is envisaged includes strip mining, where large gravel scalping and plant tailings are used as backfill material prior to final rehabilitation. Articulated dump trucks are used to excavate, load, and move the ore and gravel to the neighbouring treatment facility. The screening and processing factories' haul roads will offer access to the numerous trenches.

A haul road from the screening and processing units will give access to the numerous trenches. Using standard open pit mining machinery, including two articulated dump trucks supported by suitable excavators and a front-end loader, the operation will be carried out. In case underground

operations are required at a later stage of this anticipated development, the potential of creating subsurface channels and shafts would be looked into and studied.

Prior to the excavation of the ores and gravel, the vegetated soil overlying the intended trenches is scraped and stockpiled on a designated dump for use in rehabilitation at a later time. With 60-t excavators, gravel and ores are loaded onto ADTs. To the screening plant, the ore is carried. Backfilling shall be a continual operation as part of the bulk sampling procedures. At first, the activity will be carried out using standard open-pit mining equipment, which follow:

QTY/Units	Type of equipment
4	Excavator
4	Front-End Loader
4	Articulated Dump Trucks
1	Doser
2	Water Trucks
1	Bulldozer

1	16ft – Rotary Pan
1	Jig/DMS/Sinter Plant/Rotary Plant
2	Crushers and Screens
2	Power Generators
QTY/Units	Type of equipment
3	Drill Rigs
2	Screen
4	Crushers
5	Utility vehicles and small tools
1 each	Diamond recovery unit with flow sort machines, plants and recovery, crushing and screening equipment.

Ores and kimberlitic material are put onto a vibrating grizzly, and material larger than +85 mm is discarded back into the open pit (approximately a 25% reduction). The remaining -85mm portion is put into a 16-foot, 100 tph treatment-capable rotary pan. Some of the hefty banded iron stones are extracted using a magnetic separator. To make sure the pans are working at the proper density, tracer tests are performed frequently. Every hour, about 2.5 tonnes of concentrate are tapped from the pan and brought in sealed containers to the last recovery facility. A holding bin, sizing screen, sizing bins, and one cutting-edge Flowsort X-ray recovery machine make up the final recovery unit, which recovers diamonds from the +2mm to -32mm size fraction. The X-ray concentration will be manually sorted in the end. Continuous rehabilitation will take undertaken, with just one trench open at any given time.

To whom they will be disposed of:

The kimberlitic material and gravels might provide 8 800 carats at a grade of 2 carats per hundred tonnes. To estimate the average US dollar carat worth of the diamonds, they will be sold at a recognized diamond tender house in Kimberley or other worldwide locales connected to the Kimberly Process. Site preparation is another Prospecting Method component.

Topsoil stripping and vegetation clearing are both parts of site preparation. Topsoil is stockpiled for use in rehabilitation in the future.

5) Earthworks

Following site preparation all topsoil and some waste rock is dozed and stockpiled separately for re-use for rehabilitation activities

Drilling

It will be necessary to remove some of the topsoil and overburden. Up until the economic ore body is disclosed, the waste rock is drilled in benches. High quality, effective, and efficient methods are used to complete this. The method must use the best available industry standards. Similar to how the ore is broken, waste and overburden materials are carefully avoided so as not to contaminate the ore during drill operations.

Only if it is considered essential will blasting take place. If blasting is deemed essential at any time throughout this proposed development, all advised best practices shall be followed.

Removal of waste rock

Broken waste rock is loaded by excavator and hauled by auxiliary dump trucks to the waste dumps where -/*-it is tipped.

Rehabilitation

As prospecting efforts progress, ongoing rehabilitation of the excavated areas utilizing techniques such concurrent or progressive backfilling will take place once the open pit and trench achieve a stable condition. In this manner, the pit voids will be filled with waste rock (once there is enough space to dump)

MINERAL PROCESSING METHOD

Primary crushing and screening

ROM is transported via auxiliary dump trucks to the primary crushing and screening plant. The first crusher and screening plant is used to reduce the size of the ore to the fractions needed for the subsequent plant processes. Prior to being transported through equipment or conveyor to the secondary crushing and screening plant for additional resizing, ROM that has undergone the main crushing and screening plant

is heaped first. At all crushing and screening stations, dust control should be implemented using the proper methods.

Secondary crushing and screening

The secondary crushing and screening facility is used to size the ore in accordance with the required product standards. The crushed ROM stockpile or one of the product stockpile locations receives the final product from the secondary crushing and screening facility. The processed ore that will be heaped up may range from -6+1 mm to -75 + 6 mm. Separate piles of different individual fractions are possible. The finished product is loaded out of site before being marketed to regional and global markets for further benefit. Product should be loaded out of site using front end loaders or comparable loaders.

Superfine waste material will be re-used as topsoil for rehabilitation and re-vegetation purposes.

Tertiary crushing and screening (to be sent to nearby mining operations for further processing)

To prepare the ore for sinter plant feed, it will go through the tertiary crushing and screening stage (- 40, +6 mm material). Prior to being transported to the sinter plant, high-grade product will be stacked up in the tertiary product stockpile. Before being delivered to the Dense Medium Separator (DMS) for additional processing, manganese from the secondary crushing and screening plant will be stacked up at a low-grade stockpile. The thickener will be used to dispose of any fines material (-1 mm) that the tertiary crushing and screening plant produces into the tailings dam.

Sintering (to be sent to nearby mining operations for further processing)

To agglomerate the ore and boost the manganese content, it will be sintered in the sinter plant by applying heat (by burning off the carbonaceous material). Before the manganese ore is aggregated in a rotary drum, raw materials will be combined with it in a rotating mixing pan. A steel belt will transport the aggregated material into the sinter furnace. A multi-compartment oven that uses gas or heavy fuel oil for ignition is a sinter furnace. For sintering, igniting, and drying, the front compartments will be utilized. Cooling will take place in the back compartments. To remove the majority of the particles and contaminants from gas emissions, cascade scrubbers will be used. In the thickening plant, the used scrubber water will be recycled. Bag filters will be used to collect and recycle dust emissions for the sinter feed. Prior to being loaded out of site and sold to third parties, the finished product will be stacked atop the product stockpile.

Dense medium separation (to be sent to nearby mining operations for further processing)

Manganese ore that is below the acceptable grade (- 6 + 1 MM) can be beneficiated via dense medium separation prior to the sintering stage, successfully improving the ore. Using the density difference between the waste and manganese, the material will be delivered to the temporary discard site for waste disposal while the manganese will be sent to the sinter plant's stockpile for sinter feed. While a backup sample is kept on hand, samples will be forwarded to a lab for analysis.

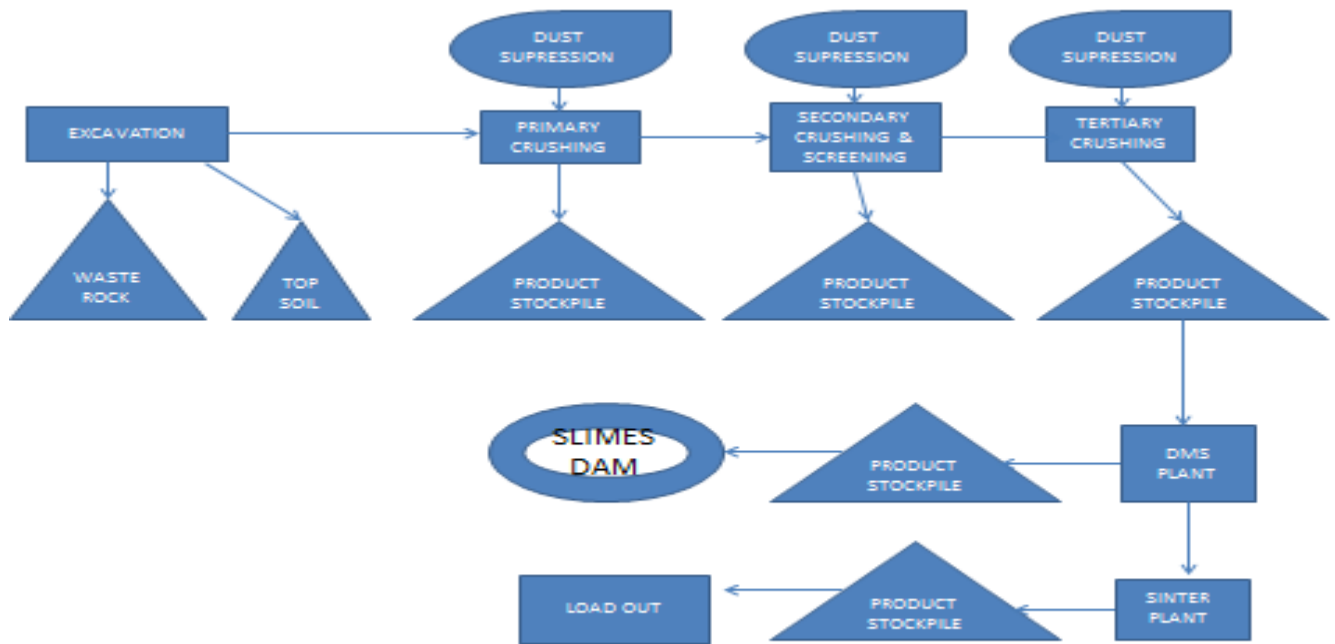


Figure 3: Schematic representation of the planned process flow

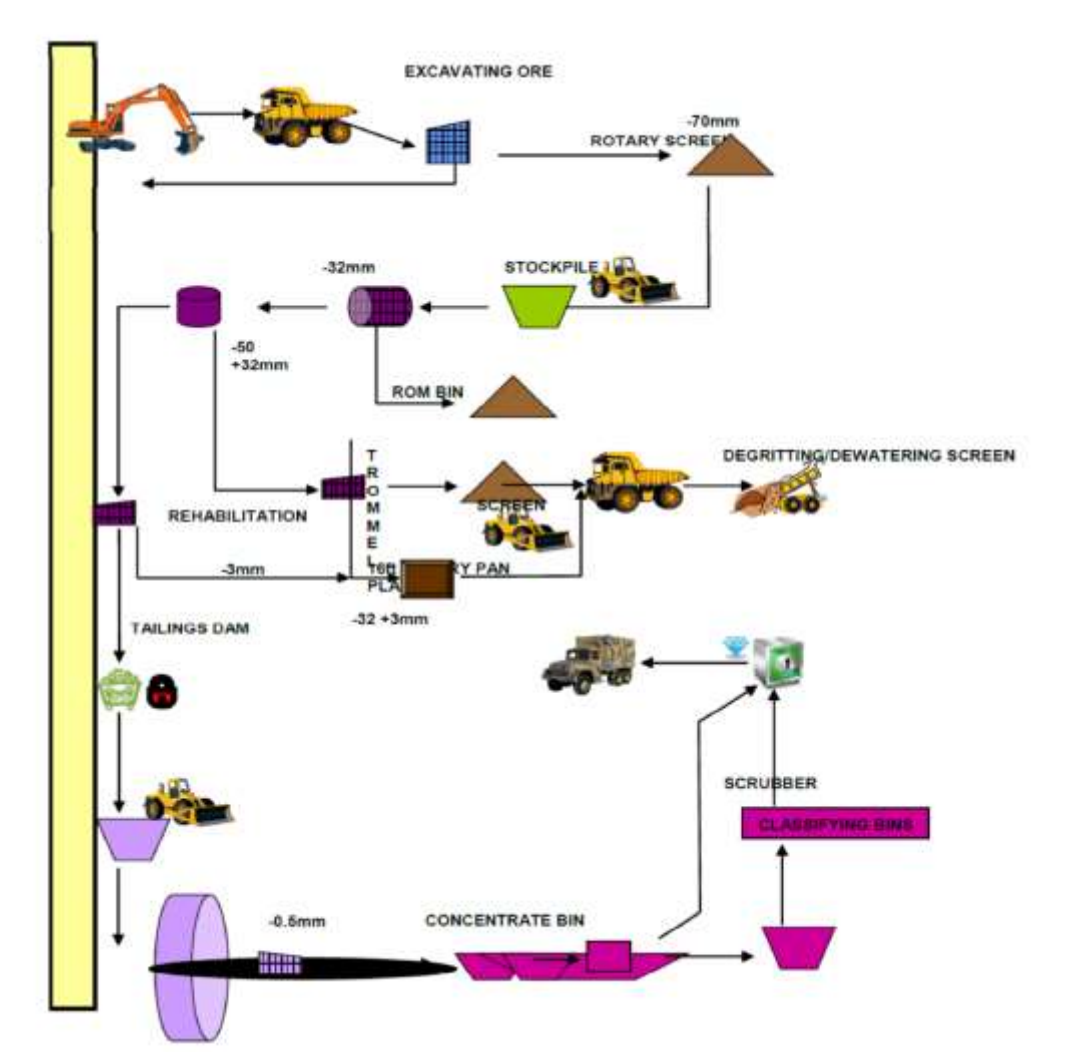
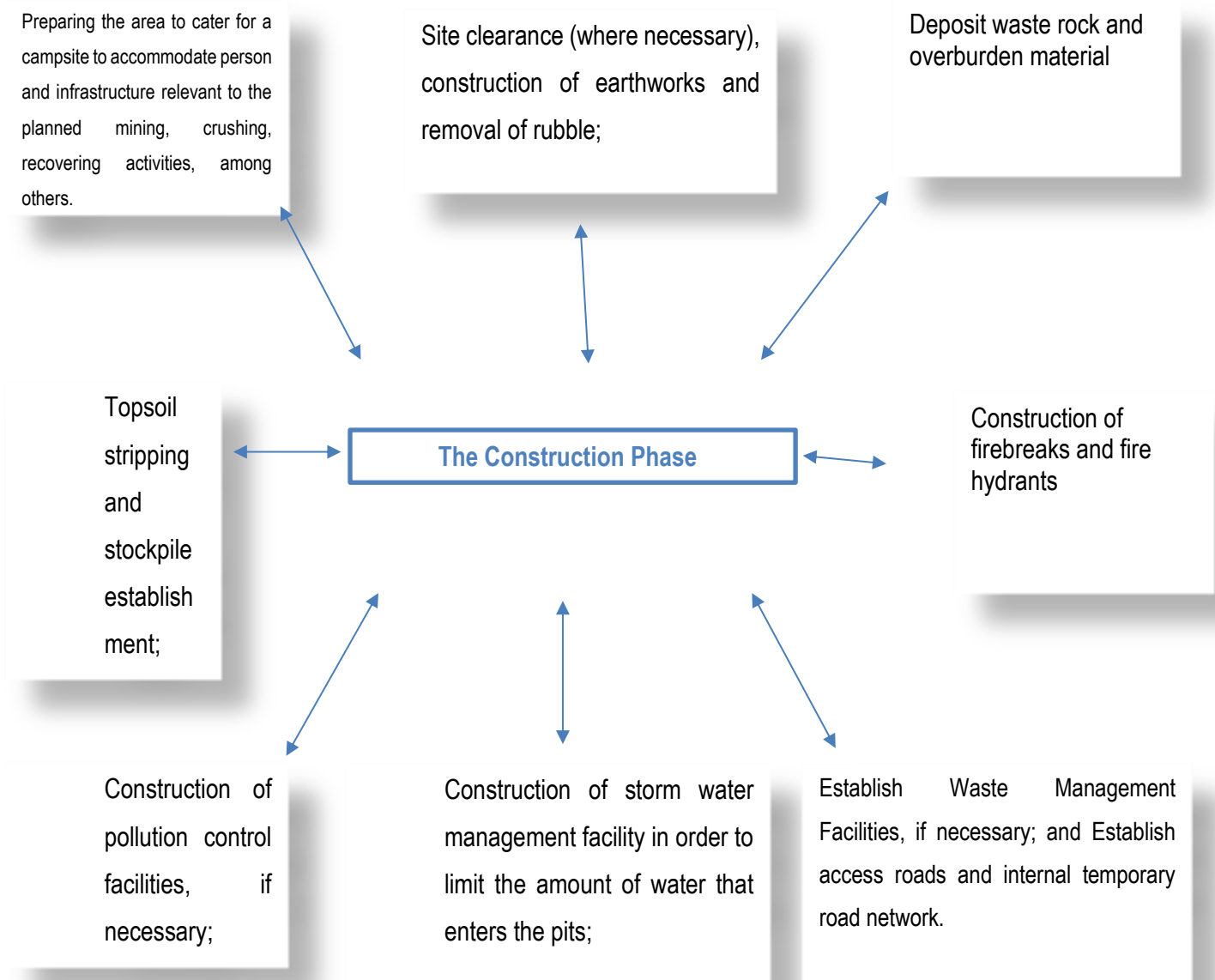


Figure 4: Schematic representation of the planned process flow for diamond processing.

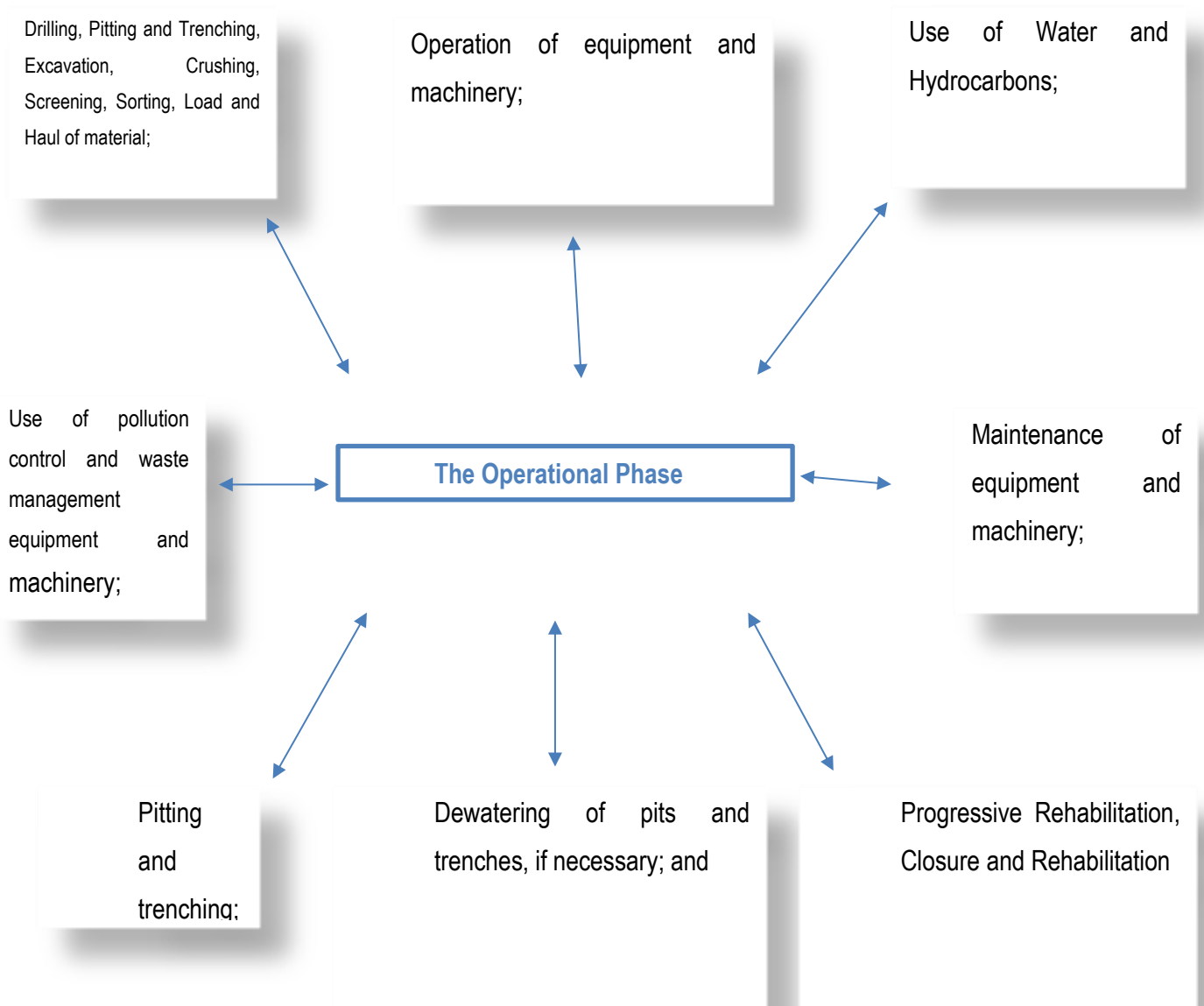
5.2.3 Construction Phase

The Construction Phase entails the following:



5.2.4 Operational Phase

The Operational Phase entails some of the following:



5.2.5 Decommissioning Phase

In these procedures, mobile equipment will be used. When movable infrastructure is deployed, the decommissioning process will be simple because the infrastructure will be moved from the location. It is important to note that the rehabilitation program will be planned to run concurrently with the mining and crushing activities in order to finally provide "pain-free" recovery. Species that have been moved or removed will be replanted or put back in their original habitat.

Table 3: Bulk Sampling Activities

ACTIVITY		DETAILS		
Number of pits/trenches planned		5 pits and 100 trenches		
	Number of pits/trenches	Length	Breath	Depth
	5/100	100 – 200 m	100 m	200 m
Locality		See figure 1		
Volume Overburden (Waste)		$\leq 1\,000\,000\text{ m}^3$		
Volume Ore		$\approx 3\,000\,000\text{ m}^3$		
Density Overburden		To be determined during Prospecting Activities.		
Density Ore		$\approx 5.15\text{ g/cc}$ To be verified during Prospecting Activities.		
Phase when bulk sampling will be required		Phase 3		
Timeframe(s)		From time-to-time during months 7 to 30		

6 A description of the policy and legislative context within which the development is proposed including and identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process

In order to protect the environment and ensure that this development is undertaken in an environmentally responsible manner, there are a number of significant pieces of legislation that will be consulted for this study. After a brief scoping of applicable legislation these include but may not be limited to the following:

6.1 The Constitution of the Republic of South Africa, 1996

The Constitution of the Republic of South Africa is the Supreme Law of our country and every legislation and law should be consistent with the provisions of the Constitution.

The Constitution makes provision for the environmental rights in the Bill of Rights, Chapter 2. This being found in section 24 in its entirety. In essence this section provides for the protection of the environment through measures that promote conservation and prevent the pollution of the environment to ensure that future generations also enjoy the benefits of the environment.

Section 24 asserts that:

“Everyone has the right-

- (a) To an environment that is not harmful to their health or well-being; and
- (b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that-
 - (i) prevent pollution and ecological degradation;
 - (ii) promote conservation; and
 - (iii) secure ecologically sustainable development and use of natural resources

While promoting justifiable economic and social development.”

As asserted in and guided by the legislation, the environmental management objectives of the proposed project are to ensure future benefit, the use of natural resources, the promotion and support of socio-economic development and sustainable development.

6.2 NEMA and EIA Regulations published on 7 April 2017 (GN R327, GN R326, GN R325 and GN R324)

The EIA Regulations (2017) under the NEMA consist of three (3) categories of activities namely: Listing Notice 1 Activities (GNR. 327 of 2017) which require a Basic Assessment study, Listing Notice 2 Activities (GNR. 325 of 2017) which require both a Scoping and an EIA study for authorisation and Listing Notice 3

Activities (GNR. 324 of 2017) which requires a Basic Assessment study for specific activities in identified sensitive geographical areas. The DMRE is responsible for the authorisation of these activities.

The National Environmental Management Act, 1998 (Act No. 107 of 1998) sets out a number of principles in the first two (2) chapters of the act to give guidance to applicant or proponents, private land owners, members of public and authorities on how to handle environmental matters. Various necessities such as cooperative environmental governance, compliance and non-compliance, enforcement, and regulating government and business impacts on the environment, underpin the NEMA. Section 2(2) of the NEMA urges sensitivity to the welfare of communities regarding their physical psychological, developmental, cultural and social interests. Development must be socially, environmentally and economically sustainable, which requires that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimized and remedied.

The NEMA is the national legal framework that regulates environmental issues. The NEMA, as the primary environmental legislation, is complemented by a number of sectoral laws governing mining, waste, air quality, biodiversity, marine living resources, forestry, protected areas, pollution and integrated coastal management. The National Environmental Management Act (NEMA) revolves around the environmental management principles, which provide that 'environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably and development must be socially, environmentally and economically sustainable. The principles include specific reference to environmental justice: s 2(4)(c) provides that 'environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.

The national legal framework under which Environmental Impact assessments are undertaken is the National Environmental Management Act, 1998 (Act No. 107 of 1998) NEMA (as amended). The EIA studies under discussion are often complex as a result of many contributing factors. The aim of EIA studies is to uphold environmental and socio-economic justice pertaining to any proposed development among other things. A definition of "environment" is given in section 1 of the NEMA.

6.3 The National Heritage Resources Act, 1999 (Act No. 25 of 1999)

This Act introduces a dispensation for the conservation of what was commonly known as “national monuments” and what will now be referred to as “heritage resources”

The “heritage resources” referred to above refers to any place or objects that has cultural significance, the said cultural heritage resources are thus referred to as the “national estate” of South Africa. Section 3 provides that these resources hold such significance and value for both present and future generations that they ought to be considered as part of the national estate and to be regulated by the heritage resources authority.

A three-tier system of heritage resources is contemplated by the Act, this being inclusive of national, provincial and local. Consistently, the national estate will be graded into three grades by the South African Heritage Resources Agency (SAHRA) and provincial MECs. These grades will be categorized as follows:

Grade	Description
I	Heritage resources that comprise of extraordinary qualities that they are of special national significance.
II	Heritage resources that form part of the national estate but are considered to have significant qualities within the province or region.
III	Other heritage resources that are deemed to be and have qualities worthy of conservation

The above tabled (national estate) is inclusive of but not limited to:

- a) buildings, structures and equipment of cultural significance;
- b) places to which oral traditions are attached or which are associated with living heritage;
- c) historical settlements and townscapes;
- d) landscapes and natural features of cultural significance;
- e) geological sites of scientific or cultural importance;
- f) archaeological and palaeontological sites;
- g) graves and burial grounds, including—
 - i) ancestral graves;
 - ii) royal graves and graves of traditional leaders;
 - iii) graves of victims of conflict;
 - iv) graves of individuals designated by the Minister by notice in the Gazette;
 - v) historical graves and cemeteries; and
 - h) sites of significance relating to the history of slavery in South Africa

In terms of section 38 (subject to the provisions of subsections (7), (8) and (9) of the Act), any proponent who proposes to undertake a development categorised as:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- The construction of a bridge or similar structure exceeding 50 m in length;
- Any development or other activity which will change the character of a site: - Exceeding 5 000 m² in extent;

- Involving three or more existing erven or subdivisions thereof; or
- Involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- The re-zoning of a site exceeding 10 000 m² in extent; or
- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The provincial heritage resources authority protects archaeological and paleontological resources and the said resources are the property of the State. The discovery of archaeological or paleontological objects or a meteorite in the course of development should be reported to the responsible heritage resources authority or to the nearest local offices or museum, of which they also need to notify the relevant heritage authorities of such events with immediate effect. It is for this reason that the provincial and or national offices of the South African Heritage Resource Agency (SAHRA) are going to be provided with all relevant documentation that will enable them to make an informed statutory comment as enshrined in the NHRA. A Heritage Impact Assessment and a Palaeontological Impact Assessment (Desktop Study) are going to be undertaken during the EIA Phase of the proposed Project. These environmental specialist studies will be included in the EIA Reports that is going to be published for review by I&APs during the EIA Phase. In order to comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) is going to be completed for the proposed applications and findings and recommendations of specialist are going to be considered in the EIA.

6.4 The National Water Act, 1998 (Act No. 36 of 1998)

The purpose of this Act is to ensure that the nation's water resources are used, developed, conserved, managed and controlled in ways that takes into account factors such as:

- (a) meeting the basic human needs of present and future generations;
- (b) promoting equitable access to water;
- (c) redressing the results of past racial and gender discrimination;
- (d) promoting the efficient, sustainable and beneficial use of water in the public interest;
- (e) facilitating social and economic development;
- (f) providing for growing demand for water use;
- (g) protecting aquatic and associated ecosystems and their biological diversity;
- (h) reducing and preventing pollution and degradation of water resources;
- (i) meeting international obligations;
- (j) promoting dam safety;
- (k) managing floods and draught

All these being asserted by Section 2 of the Act.

The Government is the trustee of the nation's water; thus, it is responsible for ensuring that the use and management of the water resources is such that benefits the community and in such a manner that is equitable and sustainable for both current and future generations and in adherence to the Constitution.

The concept of 'water use' is widely defined by the Act to include not only 'use' of water but also activities that could have an adverse impact on water resources. 'Water use' is defined in s 21 as including:

- (a) taking water from a water resource;
- (b) storing water;
- (c) impeding or diverting the flow of water in a watercourse;
- (d) engaging in a stream flow reduction activity;
- (e) engaging in a controlled activity;
- (f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- (g) disposing of waste in a manner which may detrimentally impact on a water resource;
- (h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- (i) altering the bed, banks, course or characteristics of a watercourse;
- (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- (k) using water for recreational purposes.'

Section 27 of the NWA specifies that the following factors regarding water use authorisation be taken into consideration:

- The efficient and beneficial use of water in the public interest;
- The socio-economic impact of the decision whether or not to issue a license;
- Alignment with the catchment management strategy;
- The impact of the water uses and possible resource directed measures; and,

A key aspect of the National Water Policy is Integrated Water Resources Management (IWRM). This recognises that water resources can only be successfully managed if the natural, social, economic and political environments in which water occurs and is used are taken into consideration. IWRM aims to strike a balance between the use of water resources for livelihoods and conservation of the resource whilst promoting social equity, environmental sustainability and economic growth and efficiency

As per Chapter 7 of the Act, the country is divided into various water management areas, yet the management will be carried out in by catchment management agencies. The catchment management must be carried out in accordance with the national water resource strategy. This strategy is there to assert the strategies, objectives, plans, guidelines and procedures of the Minister and institutional arrangements relating to the protection, use, development, conservation, management and control of water resources within the framework of existing relevant government policy.

These steps are necessary due to the fact that the nation's water resources are managed nationally thus strategies for the efficient and conservation for future generations is vital. The Act further asserts the requirements of water reserves which stems from the water classification system and is an addition to the strategies. the water planning regime under the National Water Act includes a water resources classification system which involves determining the class of the water resources and the relevant resource quality objectives.

As mentioned, the requirement of water reserves is necessary to mitigate the unfortunate event of water shortages. This being an important thing to factorise into the planning and legislation of water laws due to the fact that the shortage of water would result to a number of people being deprived of water, which in turn is an infringement of basic rights. Thus, the dignity and basic rights of people always have to be considered with utmost scrutiny in decision making. It is for one of these reasons, amongst many others why a reservoir as a reserve is necessary.

Section 1 of the National Water Act asserts this by stating the factors considered in the implementation of reserves, this includes the quantity and quality of water required.

The quality and quantity ought to:

- (a) to satisfy basic human needs by securing a basic water supply, as prescribed under the Water Services Act for people who are now or who will, in the reasonably near future, be—
 - (i) relying upon;
 - (ii) taking water from; or
 - (iii) being supplied from, the relevant water resource; and
- (b) to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resources.

In addition to the National Water Act, 1998 (Act No. 36 of 1998) and the National Environmental Management Act, 1998 (Act No. 107 of 1998), the following legislation and guidelines/quality standards are applicable to hydrogeological investigations and assessments:

- National Water Act, 1998 (Act No. 36 of 1998);
- National Water Resource Strategy (NWRS, 1st Ed., September 2004);
- Department of Environmental Affairs and Development Planning's (DEA&DP) Guideline for Involving Hydrogeologists in EIA Processes (June 2005) (Snayman, 2005);
- Department of Water Affairs and Forestry's (DWAF) Integrated Water Resource Management: Guidelines for Groundwater Management in Water Management Areas in South Africa (DWAF, 2004).

This EIA study underway is going to be used to support the Water Use Licencing Application Process.

6.4.1 Controlled Activities

The Minister of Human Settlements, Water and Sanitation is allowed to regulate activities which have a detrimental impact on water resources by declaring them to be controlled activities. The following are considered to be controlled activities:

- Irrigation of any land with waste or water containing waste generated through any industrial activity or by a water work;
- An activity aimed at the modification of atmospheric precipitation;
- A power generation activity which alters the flow regime or a water resource;
- Intentional recharging of an aquifer with any waste or water containing waste; and
- An activity which has been declared as such under Section 38.

No person may undertake a controlled activity unless such person is authorised to do so by or under this Act. The Minister may, by notice in the Gazette, in general or specifically, declare an activity to be a controlled activity. Such notice might be for a specific activity on a specific site.

6.5 National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

Government Notice Regulations 921 (of 29 November 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) determine that no person may commence, undertake or conduct a waste management activity listed in the schedule unless a license is issued in respect of that activity.

The National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS). Sustainable development requires that the generation of waste is avoided, or where it cannot be avoided, that it is reduced, re-used, recycled or recovered and only as a last resort treated and safely disposed of. The objects of the Act, set out in s 2, are:

- (a) to protect health, well-being and the environment by providing reasonable measures for—
- (i) minimising the consumption of natural resources;
 - (ii) avoiding and minimising the generation of waste;
 - (iii) reducing, re-using, recycling and recovering waste;
 - (iv) treating and safely disposing of waste as a last resort;
 - (v) preventing pollution and ecological degradation;

(vi) securing ecologically sustainable development while promoting justifiable economic and social development;

(vii) promoting and ensuring the effective delivery of waste services;

(viii) remediating land where contamination presents, or may present, a significant risk of harm to health or the environment: and

(ix) achieving integrated waste management reporting and planning;

(b) to ensure that people are aware of the impact of waste on their health, well-being and the environment;

(c) to provide for compliance with the measures set out in paragraph (a); and (d) generally, to give effect to s 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.' Broadly, the Act deals with the following aspects: national waste management strategy, norms and standards; institutional and planning matters; waste management measures (which contains most of the 'meat' of the Act); licensing of waste management measures; waste information; compliance and enforcement; and the technical and administrative matters found in most Acts.

'Waste' is defined in s 1 as: 'any substance, whether or not that substance can be reduced, re-used, recycled and recovered—

(a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;

(b) which the generator has no further use of for the purposes of production;

(c) that must be treated or disposed of; or (d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector,

The Waste Management Measures are necessary to mitigate the consequences of waste mismanagement. These Management measures include:

Priority wastes;

- General duty in respect of waste management;
- Reduction, re-use, recycling and recovery of waste;
- (Listed) waste management activities;
- Storage, collection and transportation of waste;
- Treatment, processing and disposal of waste;
- Industry waste management plans;
- Contaminated land; and
- Other measures.

The Minister has the power to declare a waste to be a priority waste if he or she believes on reasonable grounds that the waste poses a threat to health, well-being or the environment because of the quantity or composition of the waste and that specific waste management measures are required to address the

threat; or that the imposition of specific waste management measures in respect of the waste may improve reduction, re-use, recycling and recovery rates or reduce health and environmental impacts. Such a notice must specify the waste management measures that must be taken in respect of the priority waste, which may include a prohibition on the generation of such waste and measures for the management of that waste. Declaration as a priority waste will result in that waste being prohibited for import, manufacture, processing, sale or export, unless it complies with specified requirements.

Section 16 imposes duties in respect of waste management: first, a holder of waste (who is defined in s 1 as a person who imports, generates, stores, accumulates, transports, processes, treats, or exports waste or disposes of waste) must take all reasonable measures in terms of s 16(1) to:

- (a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;
- (b) reduce, re-use, recycle and recover waste;
- (c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- (d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;
- (e) prevent any employee or any person under his or her supervision from contravening this Act; prevent the waste from being used for an unauthorised purpose.

6.6 Agricultural Laws Rationalisation Act, 1998 (Act No. 72 of 1998)

The Agricultural Laws Rationalisation Act, 1998 (Act No. 72 of 1998) was enacted in order to provide for the rationalisation of certain laws relating to agricultural affairs that remained in force in various areas of the national territory of the Republic prior to the commencement of the Constitution of the Republic of South Africa; and to provide for matters connected therewith.

The agricultural laws that were promulgated after the enactment of the Agricultural Laws Rationalisation Act have to be consistent with the provisions of the Constitution.

6.7 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

The object of the new Act is—

- (a) to protect the environment by providing reasonable measures for—
 - (i) the protection and enhancement of the quality of air in the Republic;
 - (ii) the prevention of air pollution and ecological degradation; and

- (iii) securing ecologically sustainable development while promoting justifiable economic and social development; and
- (b) generally, to give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) seeks to safeguard the environment by establishing reasonable safeguards for the preservation and improvement of South Africa's air quality, the prevention of air pollution and ecological degradation, and the promotion of ecologically sustainable development while ensuring justifiable economic and social development. According to Government Notice Regulation 248 (of 31 March 2010), which was issued pursuant to Section 21(1)(a) of the National Environmental Management Act: Air Quality Act, certain listed activities that produce atmospheric emissions that have or may have a negative impact on the environment are required to have an Atmospheric Emission License (AEL). The Regulation also specifies the minimal emission requirements for the activities specified. An atmospheric emission license is not anticipated to be necessary for the proposed development.

6.8 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA, the protection of species and ecosystems that warrant national protection, and the use of indigenous biological resources in a sustainable manner, amongst other provisions.

The National Environmental Management: Biodiversity Act (hereafter referred to as the Biodiversity Act) is based on the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity. According to the long title of the Act, its objectives are to 'provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith'.

These objectives should be considered in the light of the objectives of the Convention on Biological Diversity (CBD):

- The conservation of biological diversity;
- The sustainable use of the components of biodiversity;
- The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies; and by appropriate funding.

The primary objectives in Section 2(a) are essentially the objectives of the Convention on Biological Diversity, to which this Act is supposed to give domestic effect. Objectives are also stated to include (not mentioned in the long title) giving effect to ratified international agreements relating to biodiversity which bind South Africa and the provision for co-operative governance in biodiversity management and conservation. The other international agreements intended to be implemented by the Biodiversity Act are the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); the Convention on Wetlands of International Importance (Ramsar Convention); and the Bonn Convention on Migratory Species of Wild Animals.

In fulfilling the rights contained in section 24 of the Constitution, the state through its organs that implement legislation applicable to biodiversity, must—

- (a) manage, conserve and sustain South Africa's biodiversity and its components and genetic resources;
- and (b) implement this Act to achieve the progressive realisation of those rights.

In the same way that a central aspect of NEMA is integrated environmental planning, biodiversity planning is also placed by the Act at the vanguard of biodiversity conservation. The framework of plans/strategies provided for in Chapter 3 operates at different levels but in a manner co-ordinated with one another and with the environmental management and implementation plans required by NEMA.

6.9 National Forests Act, 1998 (Act No. 84 of 1998)

The National Forest Act is there for the protection of particular trees. The protection thereof can be declared by the Minister through his powers in that judicial sense. This said protection insinuates that the removal, cutting, disturbance, damage or destruction of any of the protected trees is not permitted.

According to Section 12 (1) d (read with Sections (5) 1 and 62 (2) (c)) of the National Forest Act (Act 84 of 1998), a licence is required to remove, cut, disturb, damage or destroy any of the listed protected trees.

There is a list of the protected trees for the sake of reference and this list is updated periodically to make provision for endangered species of trees and other protected trees for their respective reasons. The most recent list of protected tree species was published in November 2014. The protected trees that commonly occur in this region are *Acacia erioloba* and *Boscia albitrunca*.

It is important to take note that the impulsive cutting, removal, disturbance, damage or destruction to trees is not permitted unless The Department of Agriculture, Forestry and Fisheries (DAFF) issues a licence for any removal, cutting, disturbance, damage to or destruction of any protected trees.

6.10 Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act currently addresses alien invader plants. The Conservation of Agricultural Resources Act addresses soil conservation. Its objects are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water resources, and by the protection of the vegetation and the combating of weeds and invader plants. The Conservation of Agricultural Resources Act also regulates water pollution from farming operations. The Minister is empowered to prescribe control measures in this regard, and officials are empowered to enter upon any land in order, inter alia, to determine whether and to what extent the water sources on that land are polluted on account of farming methods or have become weaker or have ceased to exist. Conservation of Agricultural Resources Act also provides for the declaration of control measures in respect of certain types of land use

The CARA states that no land user shall utilise the vegetation of wetlands (a watercourse or pans) in a manner that will cause its deterioration or damage. This includes cultivation, overgrazing, diverting water run-off and other developments that damage the water resource. The CARA includes regulations on alien invasive plants. According to the amended regulations (GN R280 of March 2001), declared weeds and invader plants are divided into three categories:

Category	Specifications
1	may not be grown and must be eradicated and controlled
2	may only be grown in an area demarcated for commercial cultivation purposes and for which a permit has been issued, and must be controlled
3	plants may no longer be planted and existing plants may remain as long as their spread is prevented, except within the flood line of watercourses and wetlands. It is the legal duty of the land user or land owner to control invasive alien plants occurring on the land under their control.

Please do note that the proposal has considered this legislation and the implications thereof, thus should alien plant species occur within the study area; this will be managed in line with the EMP. Rehabilitation after disturbance to agricultural land is also managed by CARA. The DAFF reviews and approves applications in terms of these Acts according to their Guidelines for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011.

6.11 Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970)

A change of land use (re-zoning) for the development on agricultural land needs to be approved in terms of the Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970) (SALA). This is required for long term lease, even if no subdivision is required.

6.12 Development Facilitation Act, 1995 (Act No. 67 of 1995)

The Development Facilitation Act, 1995 (Act No. 67 of 1995) (DFA) sets out a number of key planning principles which have a bearing on assessing proposed developments in light of the national planning requirements. In the context of land reform, the prime purpose of land development policy is to establish a framework and procedures to facilitate the speedy release of land for urban and rural development programmes which will benefit those who were marginalised by previous apartheid policies. The basic aim of the Act is to introduce extraordinary measures to facilitate and speed up the implementation of reconstruction and development programmes and projects in relation to land and in doing so lay down general principles governing land development throughout the Republic.

Numerous rural residential developments, primarily on formerly agricultural land, have been approved by means of the DFA approval process. The planning principles most applicable to the study area include:

- Promoting the integration of the social, economic, institutional and physical aspects of land development;
- Promoting integrated land development in rural and urban areas in support of each other;
- Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other;
- Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs;
- Promoting the establishment of viable communities; and
- Promoting sustained protection of the environment.

6.13 Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)

The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) was promulgated in order to enhance planning and land use management efficiently and effectively. The SPLUMA enable urban areas to drive spatial transformation.

This Act provides for the efficient and safe way of land use. It is there to combat inconveniences that may affect both land users, endangered or protected plants, minerals and resources, the said inconveniences resulting from lack of planning and land management for the benefit of everyone affected.

This Act ensures that the land disturbed for the proposed project is well managed and located taking into consideration other land aspects, buildings, residential areas, economic uses and buildings.

6.14 Other Relevant Pieces of Legislation

- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);
- National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003);
- Agricultural Laws Rationalisation Act, 1998 (Act No. 72 of 1998);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);

- National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- Fencing Act, 1963 (Act No. 31 of 1963);
- Electricity Act, 1987 (Act No. 41 of 1987);
- Electricity Regulations Amendments (August 2009);
- Biodiversity Act, 2004 (Act No. 10 of 2004);
- Hazardous Substance Act, 1973 (Act No. 15 of 1973);
- Agricultural Product Standards Act, 1993 (Act No. 129 of 1993);
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and Regulations;
- Mine Health and Safety Act, 1996 (Act No. 29 of 1996);
- Road Transportation Act, 1977 (Act No. 74 of 1977);
- Civil Aviation Authority Act, 1998 (Act No. 40 of 1998); and
- Civil Aviation Act, 2009 (Act No. 13 of 2009) and Civil Aviation Regulations (CAR) of 1997.

The objectives of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), as amended are presented in Chapter 2 of the MPRDA. The MPRDA is enacted to, among other things, “promote equitable access to the nation’s mineral and petroleum resources to all the people of South Africa”. Furthermore, section 9 of the MPRDA provides an order to follow in respect of processing applications.

6.14.1 Provincial Legislation

i. Northern Cape Nature Conservation, 2009 (Act No. 09 of 2009)

The Northern Cape Nature Conservation Act 09 of 2009 promotes the protection of the listed species. It also promotes and provides for the use of natural resources, and in the same breath, promotes the protection and conservation of the said natural resources. This being done to maintain a balance in the use thereof.

The Northern Cape Nature Conservation has a list of protected flora. It is mandatory that a Biodiversity Assessment should be conducted and should any of the listed species be identified on the proposed project area, then the relevant procedure of removal should be adhered to, this being that the relevant permits should be obtained by the proponent prior to their relocation or removal. As part of the EMP, a detailed plant search and rescue operation should be conducted before the final design process this being done before the commencement of surface disturbances, if applicable. In addition, the Northern Cape

Department of Agriculture, Environmental Affairs, Rural Development and Land Reform must be consulted before the planned clearance of indigenous vegetation on site takes place.

The Act includes six schedules tabled as follows:

Schedule	Species
1	Specially Protected species
2	Protected species
3	Common indigenous species
4	Damage causing animal species
5	Pet species
6	Invasive Species

ii. **The Provincial Spatial Development Framework for the Northern Cape (Office of the Premier of the Northern Cape, 2012)**

The Provincial Spatial Development Framework (PSDF) provides for developmental planning to in consistence with the provincial legislation. In the province of the Northern Cape where agriculture and mining are predominant, solar and wind renewable energy are now emerging as some of the province's major activities.

The spatial vision for the province outlines a well-structured system of sustainable land-use zones that support the Northern Cape's economy vested in the primary economic sectors, in particular, mining, agriculture, tourism, and the energy industry.

7 A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location

7.1 Prospecting for Mineral Resources Development

One of the most important elements to think about when prospecting for the development of mineral resources is sustainability because it is crucial to the successful and efficient application of industry best practices. More than ever, developing nations like South Africa must make sure that prospecting for natural resources is supported, maintained, and closely watched as the world grapples with climate change, which among other things threatens the ecosystem's balance. One of the most significant industries in the South African economy is mining. Not only does this sector help to raise the GDP of the nation, but it also helps to reduce poverty, create jobs, and in some cases, utilise land and space more effectively. In order to ensure sustainability for both the present and future generations, these elements or features of the mining sector must be taken into account while formulating policies. Land use is governed in South Africa. Zoning is a simple concept to grasp and put into practice when changing how space and land are used. Numerous factors, including population expansion, the creation of new households, and economic development, have an impact on them.

Technology that can be used in projects related to mining has been developing to suit present and future demands. Both new and seasoned mining companies may make better and more sustainable use of the limited water supplies by utilizing mining technologies. It is important to understand the proper water usage rates and amounts for

mining-related projects. The Department of Human Settlements, Water and Sanitation is currently the Responsible Authority for the use of water resources in South Africa. As a result, an Integrated Water Use License for the proposed development will be filed with the Responsible Authority.

Employees, members of surrounding communities, and the country are among the primary beneficiaries of this project. Secondary beneficiaries include suppliers of goods and services, as well as local businesses that benefit from employee purchasing power. This is consistent with the National

Development Plan (NDP). The proposed development's Social Labour Plan aims to ensure local economic development through the implementation of various projects.

If prospecting rights are granted, the applicant believes that these small plots of land could yield commodities of high economic value. Only a small portion of the farms targeted will be temporarily disrupted. The rest of the farm will continue as usual.

7.2 National Development Plan 2030

The National Development Plan envisions a South Africa where “everyone feels free yet bounded to others”; where everyone embraces their full potential, a country where “opportunity is determined not by birth, but by ability, education and hard work”. A South Africa where “we participate fully in efforts to liberate ourselves from the conditions that hinder the flowering of our talents” as articulated in the Vision 2030.

- The NDP aims to achieve the following objectives by year 2030: Uniting South Africans of all races and classes around a common programme to eliminate poverty and reduce inequality;
- Encourage citizens to be active in their own development, in strengthening democracy and in holding their government accountable;
- Raising economic growth, promoting exports and making the economy more labour absorbing;
- Focusing on key capabilities of both people and the country;
- Capabilities include skills, infrastructure, social security, strong institutions and partnerships both within the country and with key international partners;
- Building a capable and developmental state; and
- Strong leadership throughout society that work together to solve our problems

At the core of the Nation Development Plan is the aim to ensure the achievement of a “decent standard of living” for all South Africans by 2030. A “decent standard of living” entails the following core elements as enshrined in the Bill of Rights:

- Housing, water, electricity and sanitation;
- Safe and reliable public transport;
- Quality education and skills development;
- Safety and security;

- Quality health care;
- Social protection;
- Employment;
- Recreation and leisure;
- Clean environment; and
- Adequate nutrition

South Africa's National Development Plan (NDP) 2030 was adopted by Government in year 2012.

8 Period for which the integrated environmental authorisation is required

The integrated environmental authorisation for which applied is required for a 5-year period, minimum.

9 Motivation for the Preferred Development Footprint on the Site Including the process followed to define the preferred development alternatives, including –

9.1 Details of Development Footprint Alternatives Considered

In terms of the EIA Regulations (2017), Section 21(3) - Appendix 2 (h) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site is required. In addition, the obligation that alternatives are investigated is also a required in terms of Section 24(7) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended). An alternative in relation to a proposed activity refers to the different means of meeting the general purpose and requirements of the activity (as defined in Government Notice R326 of the EIA Regulations, 2017), which may include alternatives to:

- (a) The property on which or location where it is proposed to undertake the activity;
- (b) The type of activity to be undertaken;
- (c) The design or layout of the activity;
- (d) The technology to be used in the activity; and
- (e) The operational aspects of the activity.

Sections 24(4)(b)(i) and 24(4A) of the NEMA make provision for an EIA to encompass investigation and assessment of impacts that are associated with alternatives in relation to a proposed project. Furthermore, Section 24O(1)(b)(iv) provides for the Competent Authority, in its evaluation of Environmental Authorisation, takes into account “where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment”.

It is common practise for assessment of alternatives to include the following:

- The consideration of the no-go alternative as a baseline scenario;
- A comparison of the reasonable and feasible alternatives; and
- Providing a methodology for the elimination of an alternative.

Due to the nature of the prospecting activities, no permanent services in terms of water supply, electricity, or sewerage services are required, however, substantial amounts of these resources are going to be utilised during the operations of the proposed project.

The activities will commence with a site investigation and desktop studies, which will comprise of non-invasive techniques. This manner of survey will ensure that the applicant can clearly delineate areas which are suitable for further investigation and no unnecessary surface disturbance will be undertaken.

Based on the outcome of the desktop studies and site investigation, holes are going to be drilled, pits are going to be dug for the purpose of bulk sampling. If ore and gravel are found, the applicant will determine the composition, quality and dispose of the ore and gravel.

The applicant will proceed with this way of prospecting by means of the open cast/trenching method, simultaneously or after pitting depending on the information obtained from the earlier work done. The trenches will be dug to remove, crush and screen and dispose of the ore and gravel.

All data will be consolidated and processed to determine the ore resources on or under the ground of the property. This will be a continuous process throughout the prospecting work programme.

No comparable feasible alternatives to the drilling and blasting, pitting and trenching, crushing and screening, sampling and disposing of method currently exist to the best of our knowledge. Impacts associated with the prospecting operations will be managed through the implementation of a management plan developed as part of the application for authorization.

9.1.1 Site Alternatives

In order to determine a relatively suitable site / property for a proposed development, various factors should be considered. However, only the application area relevant to this piece of work was considered for application that was lodged with the DMRE. Alternative sites / properties are not applicable.

The applicant could identify as available the area for which applied only at the time of decision-making, as other areas that are in the vicinity have issued Mining Rights in respect of them.

9.1.2 “No-go” Alternatives

The “No-go” alternative is, in essence, based on repercussions associated with the option of not going ahead with a proposed Project. This process compares all site alternatives in order to determine whether or not the proposed development may proceed. It is noteworthy that, on one hand, the proposed development has a potential to possess some economic benefits. On the other hand, the proposed development poses some negative impacts on the environment.

Identified Impact: Negative: Loss of opportunity to liberate the Resource, employment and revenue-collection.

Impact	Loss of opportunity to liberate the Resource, employment and revenue-collection				
Phase(s)	Planning, Construction, Operational, Decommissioning and Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	+1	+1	Severity	1	3
Spatial Scope	2	2	Duration	2	4
Probability	2	4	Reversibility	1	3
Environmental Risk (pre-mitigation)					+3
Proposed Mitigation					
<ul style="list-style-type: none"> • Ensure that there is stakeholder buy-in; • Aligning LED projects with those of other development role-players; • Liaison with beneficiaries to ensure needs are met; • Collaboration with other developmental role players (e.g., local and district municipalities, neighbouring mines and NGOs) during implementation of envisaged projects, and where possible aligning envisaged development projects with existing ones; <ul style="list-style-type: none"> • Expanding its skills development and capacity building programmes for non-employees; • Monitoring system to regulate Historically Disadvantaged South African procurement; • Where feasible, training should be NQF Accredited; • A record of training courses completed per individual should be kept; and • Maximise benefits from local employment, skills and economic development. 					
Environmental Risk (post-mitigation)					+12
Public Response					2

Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	+18

An opportunity to prospect for mineral resources in order to boost the economy, revenue collection by the State and contribution towards job creation will be lost if the proposed development plan does not become implemented.

9.1.3 Site Layout Alternatives

The site layout alternatives were considered during the Environmental Impact Assessment that was conducted. Alternative site layout alternatives are expected to be influenced significantly by the findings and recommendations of the detailed specialist studies that are going to be conducted during the second phase of this piece of work. Noteworthy, the use of mobile equipment requires no site layout alternatives to be presented. In order to determine a relatively suitable site for the proposed development, various factors were considered. These factors include the following:

- Accessibility of location;
 - The area of application is accessible through the regional road, R 380 from the towns of either Hotazel or Kathu;
 - Driving from R380 to site involves crossing a railway line;
 - The proposed prospecting activities are going to share the access road to site with Tshipi Borwa Mine;
- Availability of infrastructure;
 - No infrastructure is available on site currently, however, there are various mining operations in the vicinity of the prospecting right application area, which include Tshipi Borwa Mine (in the immediate surroundings), South32, Mamatwan Operations, Sebilo Resources, UMK Mine, Kudumane Manganese Resources etc.
- Available Literature;
 - The online screening tool provides sensitivity of the area of application (indicative);

- Literature in relation to the baseline environment is readily available;
- Scoping and Environmental Impact Assessment, inclusive of specialist reports provides more accurate information pertaining to sensitivity of site relative to the online screening tool.
- The availability of ore body of economic value underground and water;
 - The proposed prospecting activities are going to employ a step-by-step process to establish whether or not there is an ore body of economic value underground;
 - The step-by-step process to be implemented involves non-invasive methods, followed by invasive methods of prospecting;
 - The proposed prospecting site is adjacent to on-going mining operations of Tshipi Borwa Mine.
- Avoidance measures in terms of sterilising mineral resources;
 - An option to utilise mobile and temporary infrastructure and equipment is available to the proponent;
 - Another alternative would be to utilise infrastructure available (nearby Mining Operations) in the vicinity of the proposed prospecting right application area.
- General environmental and socio-economic justice that is possible to achieve pertaining to the proposed development;
 - The entire environmental impact assessment process that is underway is undertaken with general environmental and socio-economic justice in the background.

9.1.4 Prospecting Activity Alternatives

Currently, the proposed site is the only one applied for in respect of this piece of work. Consideration is going to be made of the information as presented in section 2 to ensure relevant, effective and efficient alternatives are utilised.

A recommendation on the prospecting method of choice is going to be made at EIA phase pertaining to these proposed mineral resources development.

It is understood that the Real Rights holder over the property, Portion 20 of Farm Mamatwan 331, has raised issues in respect of infrastructure to be utilised in respect of the proposed development. In response, the proponent considers an option of processing the material that is sampled from the area of

application at the nearby mining operations. Also, an option to utilise temporary infrastructure on site is available to the applicant. In addition, an option to apply for a Mining Right if results are positive is available to the applicant.

9.1.5 Some Technology Alternatives

Technology alternatives that are applicable to the proposed development are discussed in section 2.

9.1.5.1 Ore-processing Methods

There are numerous basic ore processing that are available to prospective miners, all of which could be modified and coupled to form multiple hybrid ore-processing methods.

9.1.5.1.1 Some Primary / Secondary Crushing

Jaw crusher

The working principle of jaw crushers (refer to Figure 5) is based on the reciprocating movement of the movable jaw with its maximum movement at the top of the crushing chamber and a minimum movement at the discharge point that compresses and crushes the ore between itself and the fixed jaw, as the material enters the zone between the jaws.

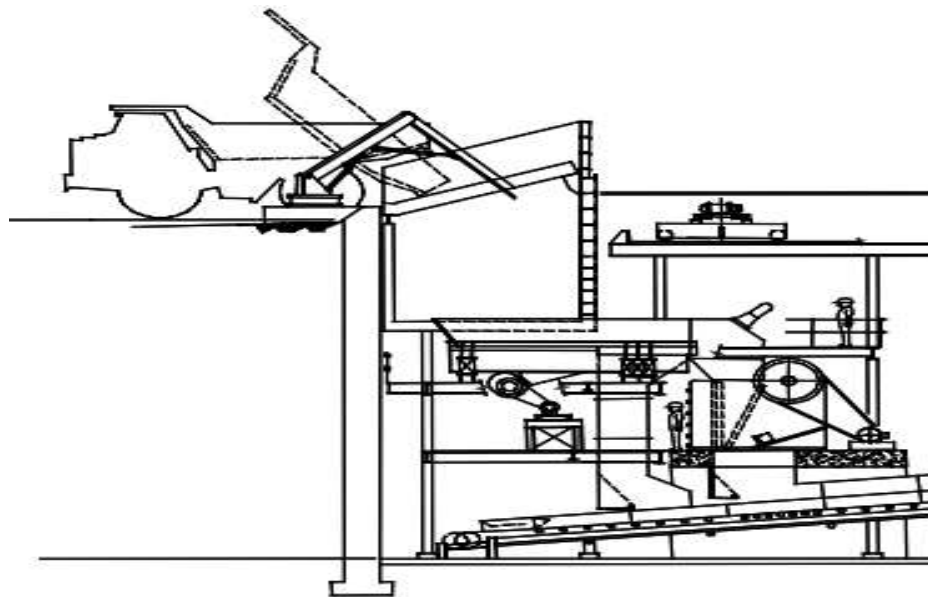


Figure 5: Section of a typical Jaw Crusher

Gyratory

Gyratory crushers (refer to Figure 6) work on a similar principle to jaw crushers but have a circular gap. Rock is compressed between a static conical bowl and a concave mantle which oscillates about the central axis.

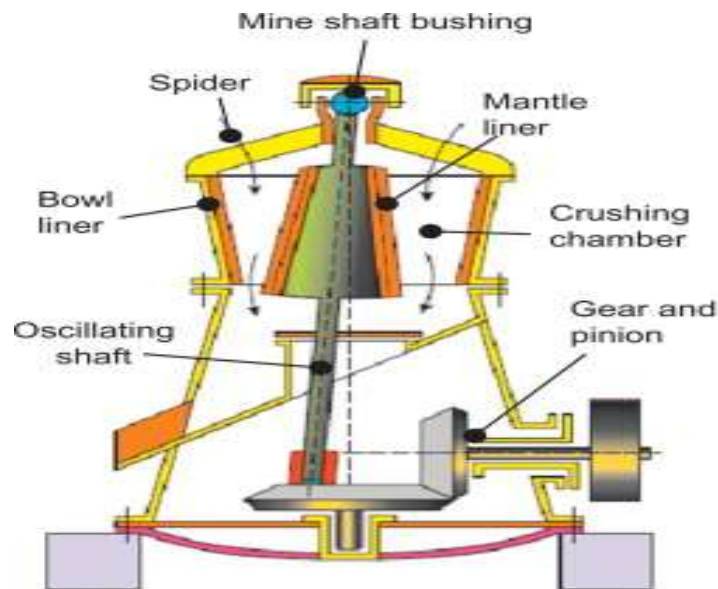


Figure 6: Schematic diagram of Gyratory Crusher

Cone Crusher

Cone crusher (refer to Figure 7) is a modified gyratory crusher. Cone crushers are used at secondary crushing stage for intermediate and fine crushing. Cone crushers are relatively more versatile than other crushers as they may be utilised at primary, secondary or tertiary crushing stage of the process.

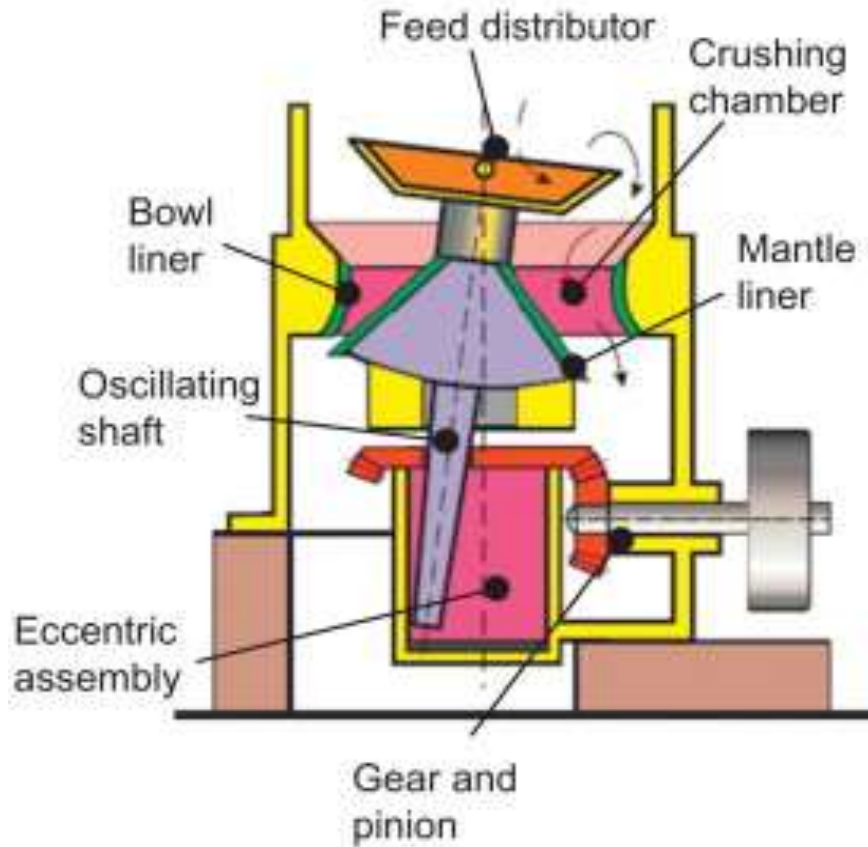


Figure 7: Schematic diagram of Cone Crusher

9.1.5.2 Some Process Plants

Dense Media Separation Plant (refer to Figure 8) is relatively more expensive to operate than Jig Plant. As the name suggests, DMS plant is more dependent on density as a parameter to control during operation. Efficient separation depends on bottom size, near density material, optimum yield and recovery, but can give lower tailings grades.



Figure 8: Dense Medium Separation

Jig Plant is relatively cheaper to operate than DMS Plant. The main parameters to monitor during operation are both size and density for improved efficiency. Jig plant yields relatively less efficient separation as a result of narrow size fractions, recovery losses, but can give higher tailings grade. Schematic diagram of Jig Plant is presented in Figure 9.

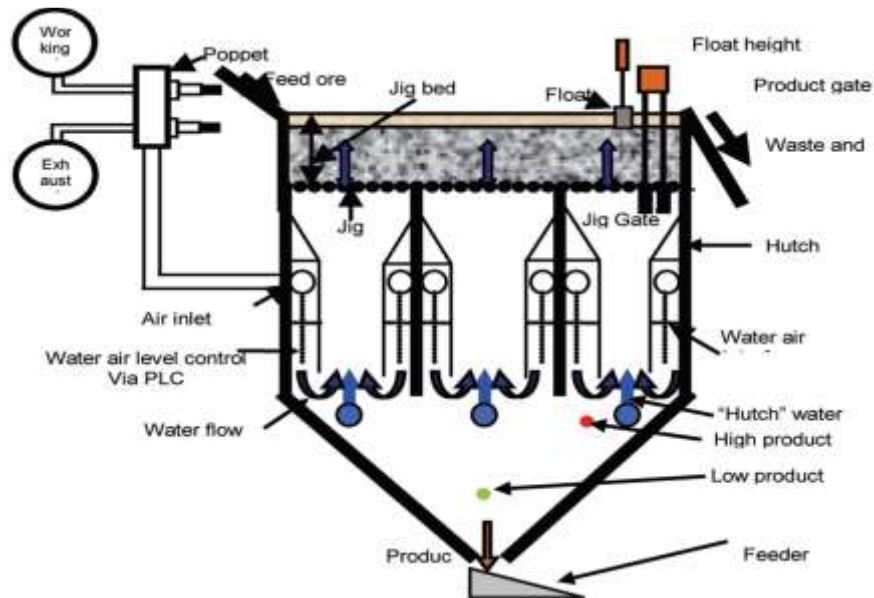


Figure 9: Schematic representation of Jig Plant

9.1.5.3 Beneficiation

Generally, ores are classified according to their size and the processing method as presented in Table 4.

Table 5: Classes of Ores

Class	Process Description	Diameter (mm)
Ore Lump	Are charged without further processing into a blast furnace or into a direct reduction furnace.	10 – 40
Ore Fine	Are agglomerated by a sintering plant before being charged into a blast furnace.	0.15 - 10
Pellet feed	Are agglomerated by a pelletizing plant before being charged into a blast furnace or into a direct reduction furnace.	<0.15
Concentrate	Concentrate is ore upgraded by a beneficiation process.	
Sintered ore	Sintered ore is ore agglomerated by a sintering plant.	
Pellet	Pellet is ore agglomerated by a pelletizing plant.	

Typical flow of sintering plant is presented in Figure 10 and typical flow of KOBELCO pelletizing system is presented in Figure 11.

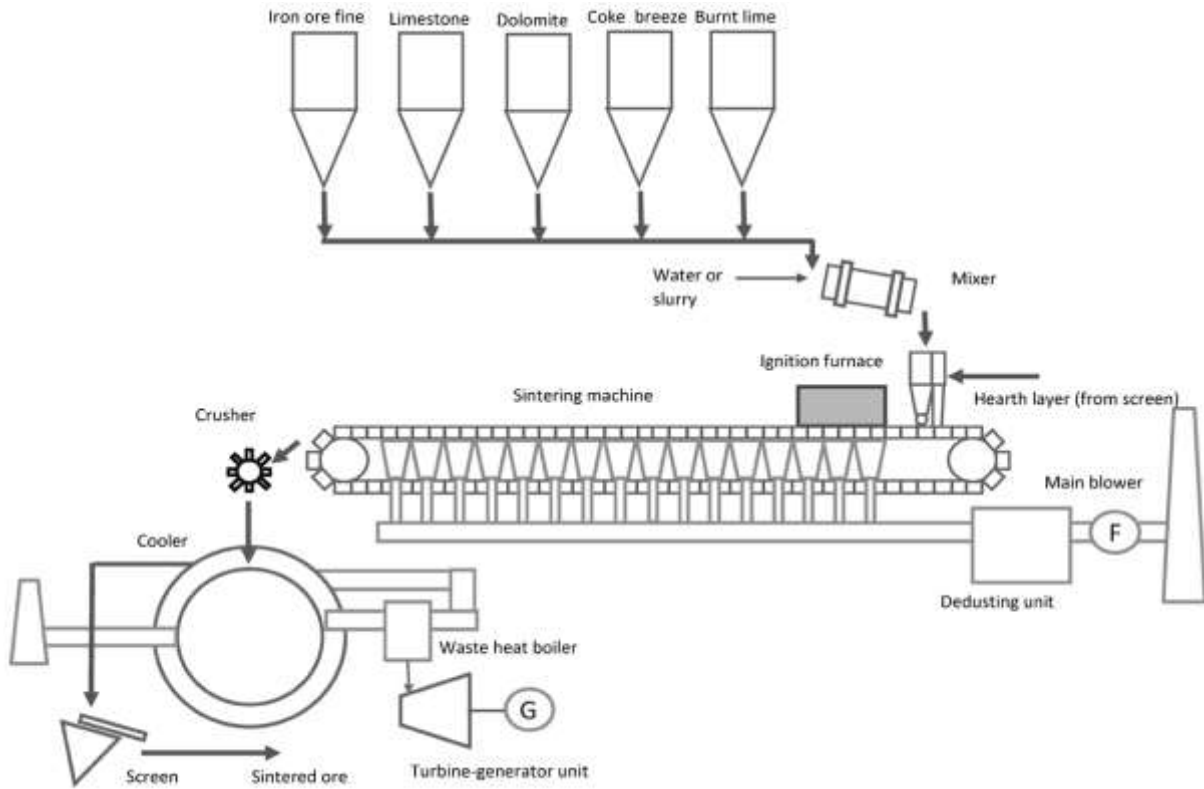


Figure 10: Schematic diagram of typical flow of sintering plant

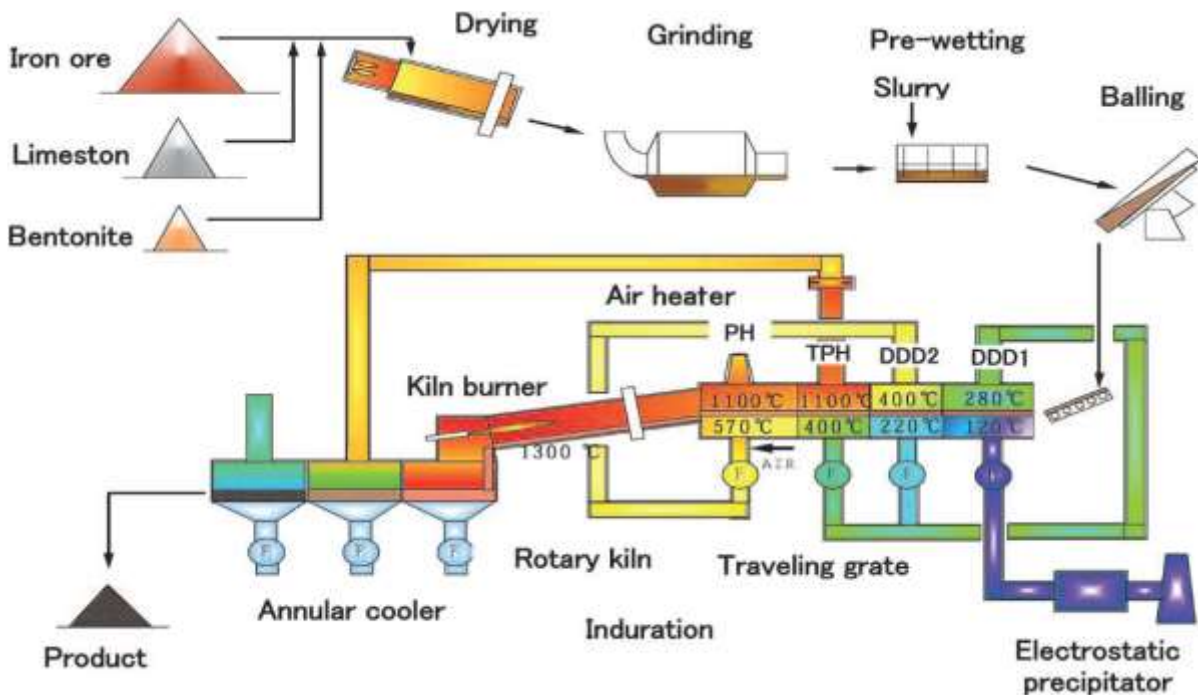


Figure 11: Typical flow diagram of KOBELCO pelletizing system.

In terms of the technologies proposed, these have been chosen based on the long-term success of their prospecting history. The prospecting activities are dependent on the preceding phase as previously discussed; therefore, no alternatives are definite, but rather a phased approach of trusted prospecting techniques. Thus, mobile processing equipment is recommended for purposes of undertaking activities in relation to the proposed development.

9.1.5.4 Water Supply Infrastructure

A key aspect of the National Water Policy is Integrated Water Resources Management (IWRM). This recognises that water resources can only be successfully managed if the natural, social, economic and political environments in which water occurs and is used are taken into consideration. IWRM aims to strike a balance between the use of water resources for livelihoods and conservation of the resource whilst promoting social equity, environmental sustainability and economic growth and efficiency.

In a province such as the Northern Cape, more specifically in the ZF Mgcawu and John Taolo Gaetsewe Districts where surface water resource is scarce, the abstraction of water from groundwater resources becomes the preferred alternative. There is an option to implement a de-watering programme that is available to the applicant. Comprehensive investigations pertaining to water supply are going to be conducted during the EIA phase.

9.1.5.5 Waste Storage, Management and Transportation

Waste is expected to be generated as a result of the proposed development and associated activities. It is proposed that waste that is generated on site should be separated at source. Waste Separation at Source pertains to setting aside post-consumer dry recyclable waste and household generated garden waste for the purpose of re-use, recycling, composting, or further processing of these materials.

Enormous value in waste separation at source emanates from, among others, procurement, recycling materials that are well sorted and uncontaminated. A basic requirement to achieve this value is that as much as possible, and efficiently as possible, waste or materials are separated early in the recycling process. This is separating waste at source essentially.

In South Africa, waste management is governed by the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) which came into effect on 1 July 2009. Following the enactment of the NEM:WA, the Minister of Environmental Affairs established the National Waste Management Strategy (NWMS) to ensure the achievement the objectives of the NEM:WA. The NWMS was approved for implementation by

the Cabinet in November 2011. The Waste Act supports the waste management hierarchy in its approach to waste management, by promoting cleaner production, waste minimisation, reuse, recycling and waste treatment with disposal seen as a last resort in the management of waste. There are a number of types of waste to be transported. Before any waste is transported, the person responsible for transporting such waste needs to assess the nature as well as the requirements for a specific load of waste to be transported. Understandably the preparations for transporting building rubble for instance, would be different to that of medical waste.

9.2 Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;

An application was lodged with the Department of Mineral Resources and Energy. Another pre-application consultation meeting is going to be conducted with the Department of Human Settlements, Water and Sanitation, Kimberley, Northern Cape. The Public Participation Process pertaining to Integrated Environmental Authorisation and Integrated Water Use License Applications were conducted jointly.

Interested and Affected Parties (I&AP's) were notified of the proposed Project Application via e-mail, notices in public spaces, newspaper adverts or facsimiles and / or virtual conferencing platforms. Site notices were placed around the application area and in public venues (in English, Setswana and Afrikaans). In addition, newspaper advertisements (in English) will be placed in a newspaper which is widely distributed in the area. The Public Participation Process was undertaken in accordance with the NWA and the NEMA process and the 2017 EIA Regulations (as amended). I&AP's will be provided an initial notification and call to register period of 30 days. The draft Scoping and Environmental Impact Assessment Report was made available for public review and comment for a minimum period of 30 days each. During this period, an Open Day will be scheduled to present the findings of the draft Environmental Impact Assessment Report to the public. All correspondence submitted by I&AP's will be utilised during the impact assessment and all correspondence received from I&AP's will be included in the final Environmental Impact Assessment Report.

The Environmental Impact Assessment Report and Environmental Management Programme (EMPr) for comment was made available to all Registered Interested and Affected Parties (I&AP's). In order to take part in the process and to submit comments on these documents, I&AP's were invited to register by completing the registration form and sending it back to the consultant.

Information on the environment, the impacts of the proposed Project and recommended mitigation and management measures; as well as more information on the application itself, will be described in these documents.

The public participation process was conducted strictly in accordance with applicable regulations. The following categories of variables were taken into account when deciding the required level of public participation:

- The scale of anticipated impact; and
- The sensitivity of the affected environment.

Consultation is required in terms of Chapter 6 of the EIA Regulations, 2017. Landowners, neighbours and other Interested and Affected Parties (I&AP's) are entitled to participate in and be consulted in respect of new proposed agricultural development applications. The proposed PPP for this application will include a number of steps, as listed below:

- Newspaper advertisement in local newspaper;
- Site notices;
- Notification of surrounding land owners, land occupiers and current right owners around;
- Specialist studies will be conducted including the use of available environmental reports; and
- Public Meeting with stakeholders involved e.g., community.

9.2.1 Overview of the Public Participation Process Undertaken during the Scoping and Environmental Impact Assessment Phases

The primary aims and objectives of conducting public participation process during the Scoping Study and Environmental Impact Assessment include the following:

- To notify Interested and Affected Parties (I&APs) of the proposed Project;
- To document and consider issues, comments and concerns as raised by I&APs;
- To promote transparency, increase participation and raise awareness on the proposed development and associated consequences;
- To provide platform for liaison and communication with I&APs;

- To identify potential environmental, socio-economic impacts associated with the proposed development; and
- To assess and manage potential environmental, socio-economic impacts associated with the proposed development.

9.2.2 Identification of Key Stakeholders

The first step in the Public Participation Process (PPP) is to identify key stakeholders, including:

- National and Provincial Government Representatives:
 - Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARDLR);
 - Department of Human Settlement, Water & Sanitation (DHSWS);
 - Department of Public Enterprises;
 - Department of Trade and Industry (DTI);
 - Department of Mineral Resources and Energy (DMRE);
 - National Environmental Standards and Regulations Enforcement Agency (NESRA); and
 - South African Heritage Resources Agency (SAHRA).
- Relevant Local and District Municipalities;
 - John Taolo Gaetsewe District Municipality;
 - Gamagara Local Municipality;
 - Ga-Segonyana Local Municipality; and
 - Joe Morolong Local Municipality.
- State-owned Entities:
 - Transnet;
 - SANDF;
 - SACAA;
 - SANRAL; and
 - Eskom.
- Landowner and neighbours.

All I&AP information, together with record of dates and details of consultations and a record of all issues raised is recorded within a comprehensive project database. This database will be updated on an on-

going basis throughout the project, and will act as a record of the communication/public involvement process. Access to site was negotiated by the applicant from February 2023. It is in progress.

9.2.3 Availing of Background Information

Copies of Scoping Report were made accessible for review at the Kathu Library and / or Gamagara Local Municipality Offices and those of Environmental Impact Assessment Report will be made available for review in the same manner.

A briefing paper for the project has been compiled in English and translated to Afrikaans and Setswana. The aim of this document is to provide a brief outline of the proposed project, provide preliminary details regarding the EIA Process, and explain how I&APs could become involved in the project. The briefing paper, together with a comment sheet and relevant map, was distributed to identified stakeholders and I&APs via e-mail, inviting them to register for participation the proposed development and submit details of any issues and concerns that they may have.

Furthermore, the briefing paper informed I&APs and Stakeholders of the prospective registration of the Project and invited to comment on the project throughout the process. An introductory letter was sent to all I&APs and Stakeholders together with the briefing paper, questionnaire and comments sheet.

9.2.4 Advertising

In compliance with the EIA Regulations (2017), notification of the commencement of the SR process for the project was advertised in a local newspaper, the project was advertised in the Kathu Gazette local newspaper in March 2023 in English. Only an advertisement in the Kathu Gazette newspaper was required as only the Kuruman town will be located within the Kathu Gazette distribution area.

The advertisement provided an abstract on key aspects of the Project (project description, location and contact details of the Environmental Assessment Practitioner). Furthermore, the advertisement requested I&APs to register, and to become involved in the project by submitting comments and highlighting issues of concern to Abantu Environmental Consultants (Pty) Ltd. The primary aim of the newspaper advert is to ensure that the widest possible group of I&APs were informed of the project.

9.2.5 Sharing of Draft Scoping and Environmental Impact Assessment Reports with Interested and Affected Parties who requested for a copy

A database of records of all communication between I&APs and Abantu Environmental Consultants (Pty) Ltd pertaining to the proposed development was created and managed.

9.2.6 Site Notices

Site notices were prepared according to the specifications set out in the EIA Regulations. The site notices included basic information regarding the proposed Project, the details of the public participation period, the listed activities applicable to the project and the contact details of the Environmental Assessment Practitioner. Site notices presented in English, Setswana and Afrikaans were placed at public venues.

- Main Entrance gate of the property, near Tshipi E Ntle Mine, Kuruman, John Taolo Gaetsewe District, Northern Cape, South Africa;
- At Joe Morolong Local Municipality Notice Board;

9.2.7 Review of Environmental Scoping and Environmental Impact Assessment Reports

The Environmental Scoping and Environmental Impact Assessment Report were taken on a public participation process. Members of the public, Interested and Affected Parties were given a minimum of 30 days per each report to review and comment on the draft Environmental Scoping and on the Environmental Impact Assessment Report. Comments received are going to be considered in the final Scoping and Environmental Impact Assessment Reports and are going to be shared with the Competent Authority.

9.2.8 Authority Review of Draft Environmental Scoping and Environmental Impact Assessment Reports

The Consultation Environmental Scoping Report was made available for review and comments for a period of 43-days, to the following authorities:

- Department of Mineral Resources and Energy;
- Department of Human Settlement, Water and Sanitation; and
- Northern Cape: Department of Agriculture, Environmental Affairs, Rural Development and Land Reform

9.2.9 Public Review of Draft Environmental Scoping and Environmental Impact Assessment Reports

The draft Environmental Scoping Report was made available for public review at the following public locations in close proximity to the study areas, which were identified as readily accessible to I&APs:

- Kathu Library;
- Hotazel Library;
- Tsineng Library;
- Batlharos Library;
- MS Kitchin Library.

The availability of this draft report was advertised in the Kathu Gazette newspaper. A minimum of 30-day period is going to be allowed for this review process from 10 March 2023 to 14 April 2023 Stakeholders and I&APs on the project database were notified of the availability of this report by letter (e-mail) as sent out in March 2023.

9.2.10 Final Environmental Scoping and Environmental Impact Assessment Reports

The compilation of the Consultation Environmental Scoping Report entails the consideration and inclusion of all relevant comments received from the public during the review of the draft Scoping Report. The final document will be submitted to Department of Mineral Resources and Energy for authority review and decision-making and/or comments.

9.3 A summary of the issues raised by I&AP, and an indication of the manner in which the issues were incorporated, or the reasons for not including them

A summary of issues raised in presented in Table 6.

Table 6: Summary of issues raised by I&APs (Please see Annexure C)

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Comments Received			
AFFECTED PARTIES					
Landowner/s	X	14 April 2023	Objection and Comment The proposed development is likely to lead to permanent damage with no prospects of full land restoration of the Property.	In terms of section 24P (1) of the National Environmental Management Act 107 of 1998, as amended, the financial provision is going to be in the form of Bank guarantee or Cash deposit into the DMRE Rehabilitation Trust account no. 40 6703 4181 (ABSA).	Section 5.2.2 and appendices
Kuruman, John Taolo Gaetsewe	X				
Joe Morolong Local Municipality	X				
Lawful occupier/s of the land					

Landowners or lawful occupiers on adjacent properties	X				
Municipal councillor	X				
Municipality	X				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					Annexure D
Communities					
Dept. Land Affairs	X				
Traditional Leaders					

Dept. Environmental Affairs					
Other Competent Authorities affected					
SANRAL	X				
Transnet	X				
OTHER AFFECTED PARTIES					
SAHRA					Annexure D
INTERESTED PARTIES					
Agri Kuruman and / or Agri Northern Cape					

9.4 The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects

The purpose of this section is to provide baseline description of the area of application. The John Taolo Gaetsewe District dominated by both agricultural and mining activities. It is a semi-arid area with relatively high radiation in the Northern Cape, South Africa.

9.4.1 Geology

Rocks of the area are composed of pink white and grey fined-grained porphyritic granitic types which are the oldest rocks of the Swazian Erathem in the area.

The Schmidtsdrif Subgroup forms the lower part of the Ghaap Group and is divided into two formations (Boomplaas and Clearwater Formations) of approximately 100 m thick. In the middle of the formation shale becomes more predominant and ferruginised shale grey with siltstone and interbanded thin dolomite. Chert and chert conglomerate are present at the base. The upper formation consists of calcretic dolomite with few stromatolites and thin banded shale and siltstones (Beukes, 1987). The Ghaap Plateau Formation can be distinguished from the underlying formation only where the quartzite is present on the latter. Elsewhere the rocks consist of dark blue fine-grained dolomite. A few stromatolite-bearing zones, small lenses of black chert locally developed in thin shale and siltstone are present. Brown ferruginous jasper layers up to 12 m thick, separate the lower part of the formation from the overlying grey coarse-grained dolomite. A Breccia of black chert and a few stromatolites occur in the dolomite.

A third zone can be distinguished in the upper part of the formation. It contains lenses of limestone and a prominent layer of chert forms the top of the succession. The layer of chert occurs sporadically on the Maremane anticline where it is brecciated in places to form the silica breccia (Moen et al., 1977). Asbestos Hills Subgroup is the sole representative of the Ghaap Group in this area and follows conformably on the underlying rocks. The formation is divided into the Kuruman and Danielskuil Formations. The uppermost chert of the Ghaap Group grades into banded iron formation of the Kuruman Formation which varies in thickness from 180 m to 240 m. It consists of a succession of thin alternating layers of light-coloured chert and jasper and dark coloured ferruginous jaspilite. The jaspilite contains mainly magnetite, haematite and limonite. A few thin layers of riebeckite-amphibolite and shale occur in places. The rock has well developed bedding plane cleavage and contains several crocidolite bearing zones. The basal layer of the banded iron formation lies on the dolomite of the Ghaap Plateau Formation in the Maremane anticline, is brecciated and ferruginised in places and constitutes the Blinkklip Breccia (Moen et al., 1977).

The “Main Marker” with a thickness of approximately 10m, lies conformably on the banded iron formation (BIF) and forms the base of the overlying jaspilite. It is characterized by an undulating structure and consists of brown jaspilite with thin magnetite layer and chert nodules. The overlying jaspilite attains a thickness of 150 m and contains several marker layers. Several “speckled markers” are present in the lower 40 m of the succession, of which only the upper one is indicated on the map. In the south a layer of eolithic chert with the appearance of quartzite is associated with the upper speckled marker. The two together are known as the quartzite marker. The intermediate quartzite maker occurs between lower speckled markers (Moen, 1977). The Gamagara Formation was deposited on the Maremane anticline and rests unconformably on dolomite and the BIF of the underlying strata Ghaap Plateau Formation. The succession consists of a basal conglomerate with pebbles of jasper and banded iron formation, shale and white to brown quartzite. The Makganyene Formation lies unconformably on the Gamagara Formation and has a maximum thickness of less than 480 m. Tillite occurs at the base of formation and contains fragments of black, white and red chert in a reddish-brown sandy ground mass. Higher up in the succession, alternating layers of grit, tillite, and silicified mudstone and feldspathic quartzite occur. Dolomite or limestone occur interbanded in mudstone (Moen et al., 1977).

The Ongeluk Formation forms the lower part of the Olifantshoek Group. The formation consists of greyish-green andesitic lava with amygdaloids and lenses of red jasper. The Voëlwater Formation overlies the Ongeluk Formation and has a thickness of 450 m. The lower beds are banded iron stone and banded red jaspilite with chert, dolomite and lava. The upper portion of the succession consists predominantly of dolomite with chert, banded jasper and lava (Moen et al., 1977). The Lucknow Formation occurs east of the Olifantshoek Group in the Korannaberg where the strata are disturbed by a number of faults Figure 13. It lies unconformably on the Voëlwater Formation and is absent in places in the north. The formation has a maximum thickness of 1 500m. The lower portion consists mainly of shale with subordinate layers of quartzite and lava and an upper portion of whitish quartzite with lenses of flagstone and dolomitic limestone. The Hartley Formation, the upper part of Olifantshoek Group, follows conformably on the Lucknow Formation with a basal conglomerate containing pebbles of quartzite, jaspilite and lava. It is overlain by andesitic lava which contains amygdaloids, tuff, breccia and pebbles of quartzite (Moen et al., 1977). The Matsap Subgroup lie conformably on the Hartley Formation but in places is found unconformably on the Voëlwater Formation in the Korannaberg. Three members were recognized. They consist predominantly of sub-greywacke and purple, grey and brown quartzite with thin pebble beds and

a layer of conglomerate in which quartz, banded iron formation and red jasper pebbles are abundant. The Brulsand Formation consists mainly of quartzite with subordinate shale and subgreywacke. Together with the Matsap Subgroup they form the Volop Group with a thickness of 500m (Moen et al., 1977).

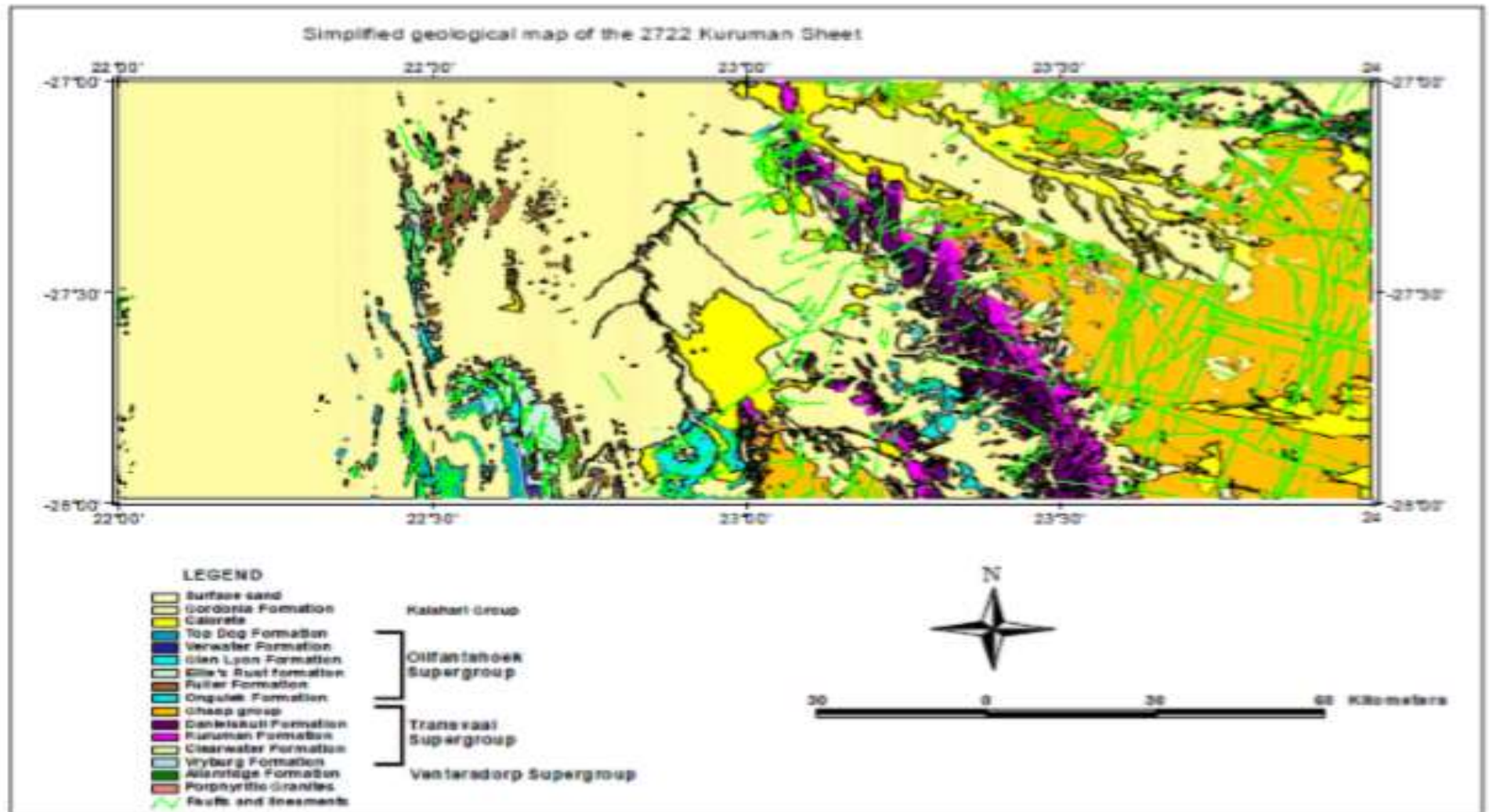


Figure 12: A simplified geological area of Kuruman (Moen, 1979)

Table 7: Lithostratigraphic column of the Kuruman Area

STRATIGRAPHY			DESCRIPTION	MAGNETIC EVENT	
			Red to flesh-coloured wind-blown sand		
			Rubble		
			River-sand and gravel		
			Surface limestone		
OLIFANTSHOEK SUPERGROUP (±2 223-2 216 MA)	BRULPAN GROUP		Groblershoop Fm	Dolerite dykes	
	VOLOP GROUP	Brulsand SBGRP	Top dog Fm		White, grey and pink quartzite with subordinate brown subgreywacke
			Verwater Fm		Grey quartzite with nodule of and lenses of haematite
			Glen Lyon Fm		Brown subgreywacke and conglomerate
		Matsap SBGRP	Ellie's Rust Fm		Quartzite and subgreywacke
			Fuller Fm		Quartzite, subgreywacke and conglomerate
			Hartley Fm		Andesitic lava with interbedded tuff, agglomerate, quartzite and conglomerate
			Lucknow Fm		Quartzite, dolomitic limestone; shale and lava
POST MASHBURG	Voëlwater SBGRP		Red jasper, dolomite, chert and lava	Basic lava	
	Ongeluk Fm		Amygdaloidal andesitic lava with interbedded tuff, agglomerate, chert, red jasper		
	Makganyene Fm		Diamicite, banded jasper, siltstone, mudstone, sandstone grit and dolomite		
	Campbell Rand SBGRP		Monteville Fm		Dolomite; quartzite
TRANVAAL SUPERGROUP (±2 224-2 219 MA)	GHAAP GROUP	Asbestos Hills SBGRP	Danielskuil Fm	Yellow-brown jaspilite with crocidolite; conglomerate	
				Kuruman Fm	Banded Iron formation, subordinate amphibolite, crocidolite, jaspilite and chert
		Schmidtsdrif SBGRP	Clearwater Fm	Conglomerate, chert and dolomite, shale	
			Boomplaas Fm	Oolitic and stromatic dolomite and dolomite with chert and quartzite lenses	
	Vryburg Fm		Quartzite, grit, conglomerate, shale amygdaloidal lava		

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VENTERSDORP SUPERGROUP (±2 714 MA)	Allanrigde Fm	Andesitic lava, amygdales and agglomerate	Andesitic lava
Porphyritic granite (basement)			

9.4.2 Climate

The area of interest is situated approximately 10 Km North West of Kathu town. The climate is predominantly semi-arid with low rainfall and high evaporation. The mean annual precipitation of the application area is approximately 374 mm/a. Climate plays a vital role in determining the availability of water resources, the nature of the natural landscape and vegetation types. Temperatures are high during the summer and low during the winter. The coldest months are experienced from June to August while the hottest months range from September to March. The average daily temperatures range from 19°C in June, to 26.7°C in January. The mean maximum average temperature during the summer months is approximately 33°C, while during the winter months the mean average minimum temperature of approximately 3,1°C. The area also experiences extreme events on a regular basis, including frost, hail, drought, and high-speed winds. Prevailing winds are north-westerly and south easterly winds with an average speed of approximately 5 m/s, between the driest and wettest months; the difference in precipitation is 73 mm. During the year, the average temperatures vary by 15.3 °C.

Climate can influence the potential for environmental impacts and related mine design. Specific issues include:

- rainfall could influence erosion, evaporation, vegetation growth, rehabilitation planning, dust suppression, and surface water management planning;
- temperature could influence air dispersion through impacts on atmospheric stability and mixing layers, vegetation growth, and evaporation which could influence rehabilitation planning; and
- wind could influence erosion, the dispersion of potential atmospheric pollutants, and rehabilitation planning.

9.4.3 Agricultural Potential

Agricultural potential is expected to be low due to shallow sandy soils and climatic constraints. Specific limitations applicable to the area include shallow soils, unfavourable climate, low water-holding capacity, stony soils and rock outcrops and erosion hazards.

Currently, predominant land uses are mining and agriculture in the Gamagara area. However, generation of energy from renewable power source is becoming common in recent times. The single most influential factor to the development of the Gamagara area is Sishen Iron Ore mining development. The Gamagara area became known to the general South African community as a result of enormous number of jobs that

are created by Sishen Iron Ore Mine. Not only does the mine provide jobs to thousands of job-seekers, it is also the single contributing factor to the planning and development of Kathu town.

9.4.4 Surface Water

There are neither perennial nor non-perennial rivers that traverse the area of application. However, Vlermuisleegte is an intermittent stream that traverses on the Northwestern side of the application area. The Gamagara River traverses North West of the area of application. The area of application is located within the Lower Vaal Water Management Area (WMA), in the D41K Quaternary Catchment drained by the endorheic Gamogara River. The regional drainage pattern of the area is primarily to the northwest in the direction of the endorheic Gamogara River, but most of the drainage lines in the mining area have historically been impacted on by mining activities. No wetlands, drainage patterns or rivers occur within the area of application.

9.4.5 Groundwater

Groundwater resource is valuable. Groundwater is defined as water that is located beneath the surface in soil, rock pore spaces and in the fractures of lithological formations. Groundwater resource is impacted by a number of activities such as domestic, agricultural and mining operations. Agriculture and mining may require dewatering services in order to operate effectively and efficiently whilst promoting environmental protection and for purposes of water supply.

The Gamagara area is groundwater resource is limited. The local mining operations require significant quantities of groundwater to support operations. The nearest mining operations to the proposed Prospecting for Mineral Resources Project that also use groundwater to support their operations are South32 (Mamatwan Operations), Tshipi Borwa, UMK and Sishen Mines.

9.4.6 Topography

The area of application is characterised by a flat topography with gentle slope. The elevation ranges from approximately 1 084 m and 1 090 m. The terrain morphological class of the area can be described as plains with high relief, either isolated moderately or strongly undulating. The area lies at an altitude of 1 087 meters above sea level, with the highest elevations occurring in the East corners. Sishen Airport is in

the South of the project area, so is the Kathu Solar Park also in the South of the project area. The application area remains relatively undisturbed.

9.4.7 Biodiversity

The area of application lies within the Savanna biome that is characterised by grassy ground layer and woody plants. The Savanna biome is the largest biome in the Southern African region.

The application area is approximately 200 hectares in size and it comprises of wooded tree, shrub species and protected tree species.

A comprehensive Biodiversity Assessment in relation to the proposed development is going to be conducted. Any area that has high population of protected plant species is going to be managed as per the provisions of applicable legislation.

9.4.8 Wetlands

A wetland as defined by the National Water Act refers to land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and which under normal circumstances supports or would support vegetation typically adapted to life in water saturated soil. However, there are no wetlands (ephemeral pans) expected but some wetlands exist in the region surrounding the project area.

9.4.9 Waste

Waste is expected to be generated as a result of the proposed development and associated activities. It is proposed that waste that is generated on site should be separated at source. Waste Separation at Source pertains to setting aside post-consumer dry recyclable waste and household generated garden waste for the purpose of re-use, recycling, composting, or further processing of these materials.

Enormous value in waste separation at source emanates from, among others, procurement, recycling materials that are well sorted and uncontaminated. A basic requirement to achieve this value is that as much as possible, and efficiently as possible, waste or materials are separated early in the recycling process. This is separating waste at source essentially.

In South Africa, waste management is governed by the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) which came into effect on 1 July 2009. Following the enactment of the NEM:WA, the Minister of Environmental Affairs established the National Waste Management Strategy (NWMS) to ensure the achievement the objectives of the NEM:WA. The NWMS was approved for implementation by the Cabinet in November 2011. The Waste Act supports the waste management hierarchy in its approach to waste management, by promoting cleaner production, waste minimisation, reuse, recycling and waste treatment with disposal seen as a last resort in the management of waste. There are a number of types of waste to be transported. Before any waste is transported, the person responsible for transporting such waste needs to assess the nature as well as the requirements for a specific load if waste to be transported. Understandably the preparations for transporting building rubble for instance, would be different to that of medical waste.

9.4.10 Heritage and Cultural Resources

The existing heritage resources, if any, are going to be protected through demarcation of the NO-GO zone(s). All encountered graves, if any, are going to be preserved. Buffer zones may be built, at least 100 m away from the preserved heritage resource. Specialists and relevant authorities will be notified and called in should any Heritage Resources of significant importance be encountered. Alternatively, a procedure/protocol that is recommended by specialists may have to be followed.

A Heritage Impact Assessment (HIA) including a Palaeontological Impact Assessment (Desktop Study) is going to be conducted in respect of the proposed Prospecting for Mineral Resources Project.

9.4.11 Socio-economic

The proposed Prospecting for Mineral Resources Project is located near the Gamagara Local Municipality within the John Taolo Gaetsewe District Municipality which includes the towns of Kathu, Dibeng, Sesheng and Olifantshoek. Sishen Mine has played a significant role in the establishment and development of the town of Kathu and surrounds since 1953. The district is largely reliant on mining with mining contributing 55.5% to the district and 77.5% to the local municipal economy (Demacon, 2016). The mining sector is also the largest employer in the local economy. According to Demacon (2016) there are approximately 50 000 people living in the Gamagara municipal area of which 65% are economically active.

9.4.12 Land Uses

To achieve sustainable irrigation of soils, the appropriate soils need to be identified, to prevent water logging and salinization. During irrigation, considerable amounts of salts are applied with the water. When water is absorbed by plant roots through transpiration, the salts are precipitated in the soil and a long-term result is the increased concentration of salts called salinization. Salinization in the soil can hamper crop growth and in extreme cases salinization will render the soil non-vegetative. These effects can be negated with proper management on soils with specific properties. For this reason, the Department of Agriculture; Northern Cape, has provided guidelines to which soil properties must adhere before a ploughing license can be granted. A ploughing license is one of the requirements, which must be fulfilled before the Department of Water, and Sanitation will grant water rights for irrigation. An irrigation potential soil survey will investigate the morphological, physical and chemical properties of soils related to drainage, salinization and sodicity, and indicate the areas where the soils are suitable for irrigation.

9.4.13 Description of specific environmental features and infrastructure on the site

It was not possible to determine all specific environmental features on site. However, there are on-going mining activities in the vicinity of the application area.

9.4.14 Environmental and Current land use map

Currently, major land uses in the region include activities related to mining and agriculture. The land capability for the study site is non-arable with low potential grazing land.

Apart from the current prospecting right application, portions of the property in the vicinity of prospecting right application are have been mined in the past or are being mined currently. A 100m buffer is proposed between the existing mining activities and the proposed development at this stage.

9.4.15 Visual Amenity

Activities and associated infrastructure possess potential to impact negatively on the visual aspect of the environment. Dust that is going to be generated from the proposed development he landscapes character, scenic quality among others.

There are approximately 26 Solar developments with either an approved Environmental Authorisation or applications under consideration within 30 Km radius of the proposed development. Additionally, the project area is within 8 Km of other civil aviation aerodrome.

Visual, scenic and cultural components of the environment can be seen as a resource, much like any other resource, which has a value to individuals, to society and to the economy of the region (Oberholzer, 2005). A Visual Impact Assessment (VIA) is a specialist study performed to identify the visual impacts of a proposed project on the surrounding environment. The proposed Project will be investigated in terms of the visual characteristics of the receiving environment.

The large size, strong regular geometry of solar facilities, and the use of mirrors or glass panels with metal supporting structures, may result in high visual contrast being created that is visible for long distances in many instances. In favourable viewing conditions, large facilities can be visible from a distance of 16km or greater; it should be noted however that viewed from such long distances, the facilities may not be recognisable as solar facilities. Built structures associated with solar power facilities would introduce complex, rectilinear geometric forms and lines and artificial looking textures and colours into the landscape; these would typically contrast markedly with natural appearing landscapes.

9.4.16 Traffic

The proposed development may increase traffic volumes in the locality. This is going to pose some risks to humans and animals. An increase in traffic volumes results in increase in air and noise pollution and possibility of accidents to occur.

9.4.17 Noise and Vibration

There are activities that are conducted in the locality which cause noise pollution. Some of them cause some vibration of the ground. They include mining activities among others. All these aspects may cause a disturbance to receptors that are in the locality.

9.4.18 Air Quality

The air quality of the pre-mining period is expected to have been of a better quality; however, the existing mines in the surrounding areas also contribute to the air quality degradation. The main concern in this regard would however be dust from the proposed diamond mining settling on surrounding areas.

However, a dust control plan will be implemented for the proposed project in order to control any possible nuisance dust that might give rise from the surrounding. The main contaminants associated with the project includes: inhalable particulate matter less than 10 microns in size (PM₁₀), larger total suspended particulates (TSP) that relate to dust fallout, VOC, SO₂, NO₂ and gaseous emissions mainly from vehicles and generators. A change in ambient air quality can have health and/or nuisance impacts. Related mitigation measures focus on pollution prevention and monitoring.

9.4.19 Site Sensitivity

Site sensitivity of the area of application is crucial to establish. This is possible achieve after specialist studies have to be conducted. The online Screening Tool suggests that the area is highly sensitive in relation with Aquatic Biodiversity only.

9.5 The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to these impacts

Impacts and risks are always associated with any proposed development. The proposed development under assessment is no different; there are impact and risks associated with the proposed project. A list of the is presented in Table 8.

Table 8: Impacts and risks associated with the proposed development

Activity/process or part thereof	Impacts (Pre-mitigation)
<ul style="list-style-type: none"> • Vegetation Clearance; Ground Levelling and Sterilisation of Mineral Resources; Changes in topography; Soil erosion by water and wind; dust generation; Soil pollution; loss of land capability; • Infrastructure, posing safety risks to personnel and animals; • Underground water; destruction of aquifers; pollution of groundwater resources; Water level 	<p>Sterilisation of mineral resources Infrastructure, posing safety risks to personnel and animals Loss of agricultural potential, soil and land capability affected through physical disturbance Physical destruction of biodiversity, including aquatics General disturbance of biodiversity, including aquatics Potential loss of floral species with conservation value and fragmentation of faunal habitats; potential loss of ecosystem function Proliferation of Invasive and Alien Plant species Change in visual amenity Surface Water (Aquatics) Groundwater Destruction of Aquifers Pollution of water Surface water</p>

<p>changes; Surface water resources; Aquatics Biodiversity;</p> <ul style="list-style-type: none"> • Water use and management; Waste Management • Site preparation; Drilling and blasting; Pitting and Trenching, Stockpiling; Load and Haul; Crushing and Screening; Processing; Transferring of material; and associated activities (including services) • Climate Change-related occurrences and monitoring • Transport system • Concurrent or Progressive Backfilling (Rehabilitation) • Use of facilities and services • Restoration of destructed biodiversity 	<p>Air pollution, greenhouse gas emissions, global warming & Climate Change Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Health and Safety Noise and Vibration Traffic Waste Agriculture Wildlife Socio-economic impact Influx of labour Interference with existing land uses, especially mining and associated infrastructure and activities for which a 100 m buffer is proposed between portion 20 of the Farm Mamatwan No. 331 and the adjacent farm portion(s).</p>
<ul style="list-style-type: none"> • Closure, post-closure alternative land uses 	<p>Loss of job opportunities Economic impact Proliferation of Invasive and Alien Plant species</p>

9.6 The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives

9.6.1 Rating of Impact

The process for determining impact significance serves at least two purposes: first, it aids in highlighting the important impacts that must be taken into account during the management and approval process; second, it displays the primary impact characteristics that are used to determine impact significance.

When determining the significance of identified impacts, the following factors must be taken into account:

Severity

Indicates if an impact is harmful or not. A limited impact on the sterilization of any mineral resources would be shown by a study of the location of surface infrastructure and related operations. Prior to the effective implementation of suggested mitigation measures, severity will be assessed. The severity will be assessed after the planned mitigation measures have been implemented successfully.

Spatial Scope

The term "Extent of Influence" refers to the region that the impact will be felt. Bracketing ranges are frequently needed since an impact's severity and significance typically have separate scales. This is frequently helpful for further defining the determined significance or intensity of an impact during the project's detailed assessment phase. For instance, a value that is high locally but low regionally.

A relative word known as "spatial scale or extent" connects the determined impact to the geographical scale or extent of the projected development and the entire planet. Before planned mitigating measures are successfully executed, the extent is on-site. The extent is on-site following the successful deployment of the suggested mitigation measures.

Duration

specifies the impact's expected lifetime;

Because infrastructure will be used in most cases throughout construction and operation of the proposed development, the sterilisation of resources will be kept to a minimum. Following the successful execution of the suggested mitigation measures, the duration lasts the entire operational life.

Consequence

Prior to the effective implementation of suggested mitigating measures, the consequence is minimal. The impact is minimal following the successful implementation of the suggested mitigating measures.

Probability

describes the probability that an impact will actually occur; before suggested mitigation measures are effectively applied, the probability (synergy/summation) of impact frequency and activity frequency will be

determined. Following the successful execution of the suggested mitigation strategies, such as, for example, choosing a site for the infrastructure and related operations in a way that will support preventative (avoid), minimization (reduce), control, and corrective actions (remedy).

Significance

Prior to the effective implementation of suggested mitigation measures, the significance will be calculated. The relevance will also be considered when the planned mitigation measures have been successfully implemented.

Cumulative Impact

When referring to an action, the term "impact" refers to the outcome of a particular undertaking that, while not necessarily significant in and of itself, may take on significance when combined with other comparable or unrelated activities taking place nearby.

In the context of a proposed development, the cumulative impact rating takes into account the anticipated effects, lingering effects, effects of other projects and activities in the form of potential synergistic, interactive system components, pattern, augmentative, consecutive impacts, and mitigation measures. Before specified mitigating measures are successfully executed, the overall impact is minimal.

The National Environmental Management Act of 1998 (Act No. 107 of 1998), as modified, and the Environmental Impact Assessment Regulations of 2017 are both in compliance with the technique of rating impact importance described here. Impact significance evaluation is a complex, step-by-step process. Several elements are taken into account when determining the impact importance rating. The actions that will be taken in this case involve identifying the Consequence (C) of each discovered potential impact while taking into account variables including the impact's nature, spatial scope, duration, severity, and reversibility. The probability of an impact occurring is the following stage. Environmental Risk of a specific impact is calculated as the sum of likelihood of occurrence and consequence. In addition, other elements including public concern, cumulative effects, and the possibility of irreparable resource loss are taken into account when determining Priority. Prioritization Factor (PF), which is derived from Priority, is used to calculate the Significance Rating (SR) of Impact. Authorities and stakeholders can use priority as a guide to help them decide on the development strategy in an educated manner. All identified alternatives will be subject to the impact assessment.

9.6.1.1 Impact Assessment, Rating and Mitigation

Below is a discussion of the criteria that were used to determine how significant the consequences were. The tables below display the parameters that were used to determine the importance of the impacts. The criteria for likelihood, intensity/severity, and relevance are based on experience and generalizations. We looked at both natural and already-existing mitigation strategies. The data offered in this piece of work and the conclusions drawn therefrom are relative and not statistical; this also holds true for the terminology. Natural circumstances, circumstances incorporated into the project's design, and already-in-place management practices were all considered to be natural mitigating strategies. Mathematically, the following formula was used to determine the impacts' consequences:

$$C = \frac{\pm N \times (SS+D+S+R)}{4} \dots\dots\dots \text{Equation 1}$$

Where:

- C = Consequence
- N = Nature of impact
- SS = Spatial Scope
- R = Reversibility
- S = Severity
- D = Duration

Mathematically, Environmental Risk of impacts was calculated by using the following formula:

$$ER = C \times P \dots\dots\dots \text{Equation 2}$$

Where:

- ER = Environmental Risk
- P = Probability
- C = Consequence

Further description of factors that are considered to determine Consequence using Equation 1 is presented in Table 9.

Table 9: Criteria for determination of ratings

Parameter	Points	Description
Nature	-1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Site	1	Site (i.e., within the development property boundary)

	2	Local (i.e., within the local area or district)
	3	Provincial (i.e., within the entire province)
	4	National (i.e., within the country boundary)
Probability	1	Improbable (the possibility of the impact materialising is very low; <25%)
	2	Probable (there is a possibility that the impact will occur; >25% and <50%)
	3	High probability (the impact may occur; >50% and <100%)
	4	Definite (the impact will occur)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (the impact will cease after the operational life span of the project)
Severity	1	Low (affects the quality, use and integrity of the system/component in a way that is barely perceptible)
	2	Medium (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way)
	3	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease)
	4	Very High (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease)
Reversibility	1	Completely reversible (Impact is reversible without any effort, minimal mitigation, time and cost)
	2	Partly reversible (Impact is reversible without incurring significant time and cost with moderate effort and mitigation)
	3	Barely reversible (Impact is reversible only by incurring prohibitively high time and cost, involving intense mitigation)
	4	Irreversible (Impact is irreversible and no mitigation measures exist)
Parameter	Points	Description
Irreplaceable loss of resources	1	No loss of resource (Impact will not result in the loss of any resources)
	2	Marginal loss of resource (impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited)
	3	Significant loss of resource (impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources of high value (services and/or functions))
	4	Complete loss of resource (Impact is going to result in a complete loss of all resources)
Cumulative impact	1	Low cumulative impact (Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, impact would result in no to negligible cumulative change)
	2	Moderate cumulative impact (Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is less likely that the impact will result in visual, spatial and temporal cumulative change)
	3	Medium cumulative impact (Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in visual, spatial and temporal cumulative change)

	4	High cumulative impact (Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change)
Public Response	1	Low public response as the issue is not raised.
	2	Medium public response as the issue was raised meaningfully and justifiably.
	3	High public response as the issue was emphasised repeatedly
Formula used to determine Environmental Risk: (Consequence x Probability)		
Parameter	Points	Description
Environmental Risk	1 – 4	Positive low impact
	1 – 4	Negative low impact
	5 – 8	Positive medium impact
	5 – 8	Negative medium impact
	9 – 12	Positive high impact
	9 – 12	Negative high impact
	13 – 16	Positive very high impact
	13 – 16	Negative very high impact

Results for determination of Environmental Risk using Equation 2 are presented differently in Table 10.

Table 10: Determination of Environmental Risk

Environmental Risk										
-16	-12	-8	-4	-4	Consequence	4	4	8	12	16
-12	-9	-6	-3	-3		3	3	6	9	12
-8	-6	-4	-2	-2		2	2	4	6	8
-4	-3	-2	-1	-1		1	1	2	3	4
4	3	2	1			1	2	3	4	
Probability										

IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

- Public Response;
- Cumulative impacts; and
- The degree to which the identified impact may cause irreplaceable loss of resources.

The triple bottom line (environment, social, and economic aspects) should be taken into account when making decisions, and this includes the public's reaction to a proposed development and any potential resultant effects as well as changes to the environment brought on by past, present, and future human activities as well as natural processes. It is suggested that in an effort to quantify even more factors during impact assessment, a factor like the Prioritization Factor be taken into account.

Mathematically, Prioritisation may be determined as presented in Equation 3.

$$Priority = PR + CI + LR \dots \dots \dots \text{Equation 3}$$

The priority ratings range from 3 to 11 and are presented in Table 11 and Significance Rating of Impacts in presented in Table 12.

Table 11: Determination of Prioritisation Factor

Priority	Rating	Prioritisation Factor
3	Low	1.00
4	Low	1.17
5	Medium	1.33
6	Medium	1.50
7	Medium	1.67
8	High	1.83
9	High	2.00
10	Very High	2.17
11	Very High	2.33

If all of the priority qualities are high, we raise priority by a factor of 0.5 in an effort to boost the post-mitigation environmental risk assessment (i.e. if environmental risk is high after the conventional impact rating, but there is high Public Response for example, then the net result would be to possibly upscale the impact to a very high significance rating). The product of Prioritisation Factor and Environmental Rating is results in relative quantity of Significance Rating of identified impact (Please see Equation 4).

$$SR = PF \times ER \dots \dots \dots \text{Equation 4}$$

Table 12: Significance Rating

Significance Rating

Limits	Description
≤ -30	Very High Negative (impacts that can be classified as fatal flaws and which are of such significance that it cannot be successfully mitigated).
> -30 & ≤ -20	High Negative (impacts must influence a decision in respect of whether or not the proposed development may go ahead).
> -20 & ≤ -10	Medium Negative (impacts could influence a decision in respect of the proposed project).
> -10 & < 0	Low Negative (impacts have minimal influence on a decision in respect of the proposed project).
0	No impact
> 0 & < 10	Low Positive (impacts have minimal influence on a decision in respect of the proposed project).
≥ 10 & < 20	Medium Positive (impacts could influence a decision in respect of the proposed project).
≥ 20 & < 30	High Positive (impacts must influence a decision in respect of whether or not the proposed development may go ahead).
≥ 30	Very High Positive (impacts that can be classified as inventive best practices and which are of such significance that it contributes new knowledge).

The impact assessment criteria presented herein is going to be considered in conducting the study underway.

9.7 positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects

9.7.1 Planning and Construction Phase

The proponent has to undertake Environmental Impact Assessments in the quest to promote sustainable development as there are impacts associated with the proposed development. These are impacts on the environment and socio-economic aspects that are expected to occur during phases such as the construction phase of the proposed Prospecting for Mineral Resources Project. It is intrinsic that such impacts are temporary in duration, but may have longer lasting effects e.g., pollution of a sensitive area during construction, could have effects that may last long after construction is over. Construction phase impacts could potentially include:

- Cost Budget, Sustainable Development Planning;
- Vegetation Clearance and Site Preparation;
- Destruction or loss of biodiversity;
- Loss of medicinal flora;

- Proliferation of invasive and alien plant species;
- Reduction in Woody Alien Species;
- Climate Change;
- Visual Amenity;
- Faunal Mortality and Displacement (including CI species);
- Increase in dust and erosion degrading habitat integrity;
- Veldfires;
- Destruction of Heritage and Cultural Resources;
- Social Impacts;
- Topography;
- Climate Change;
- Agricultural Impacts;
- Impact on heritage and cultural resources;
- Emissions from construction vehicles and generation of dust; and
- Pollution caused by spillage or discharge of construction waste water

Pollution of the groundwater and soil as a result of use of hydrocarbons and generation of infrastructural building rubble:

- Employment creation and skills development opportunities (Positive);
- Visual intrusion of construction/demolition activities;
- Noise impact from the use of construction;
- Health injuries to construction personnel as a result of construction work;
- Traffic, congestion and potential for collisions;
- Impacts on groundwater resources;
- Impact on agricultural potential and soils;
- Disturbance of flora and fauna;
- Increase in traffic volumes in the vicinity of the construction site;
- Windblown dust;
- Veldfires;
- Climate Change;
- Social Impacts;

- Agricultural Impacts;
- Impact on heritage and cultural resources;
- Noise pollution; and
- Pollution of the environment with waste.

Based on the temporary duration of the construction phase and the fact that negative impacts of construction can be readily predicted and mitigated, generally speaking, more attention will be given to the operational phase impacts of the proposed Project than to the construction phase impacts. However, wherever relevant, specialist studies would consider construction phase impacts, and in certain cases, would be focused on construction phase impacts e.g., impacts on biodiversity are mainly construction phase-related impacts.

9.7.2 Operational Phase

The EIA phase assesses impacts associated with the operating the proposed project among others. Given the long-term effect of these impacts at operational phase, the EIA study is going to be comprehensive. The suggested specialist studies are expected to identify and assess the significance of these impacts and propose mitigation measures accordingly.

Both during the construction and operational phases of the prospecting right-associated activities, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The site preparation associated activities, placement of infrastructure, pollution control dams and drilling, pitting and trenching are expected to alter the topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of land capability, agricultural potential, soil due to erosion. Vegetation is going to be cleared and topsoil is going to be stripped in preparation for placement of infrastructure and drilling, pitting and trenching, and therefore the cleared areas are going to generate dust and susceptible to erosion.

Protected trees should be avoided as far as possible during invasive prospecting activities. Placement of small access road and internal road network or any other associated infrastructure such as office area and storage areas should avoid vegetation clearance as far as practicable. Areas with high density of protected trees should be regarded as “sensitive” it should be mapped, avoided as far as possible and form part of final site layout. If protected trees cannot be avoided, the necessary authorisations, permits and/or licences must be applied for and obtained prior to disturbance of such species.

The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil would then be carried away during runoff. The declared areas will be rehabilitation, but full restoration of soil might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil erosion. Leaching can also occur, resulting in the loss of nutrients and pollution of water resources.

During the construction and operation of the prospecting right related activities, there is a possibility that hydrocarbons may leak, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusual unless they are remediated. Through seepage, these hydrocarbons may reach groundwater resources. These are some of the reasons for the storage of fuels on site to be bunded as they might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation such as remediation or disposal at an authorised disposal site, it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for grazing, but grazing activities can still be performed in areas not earmarked for mining, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate groundwater. Improper handling of hazardous material will cause contamination of nearby surface water resourced during runoff episodes and may pose risk in respect of health and safety. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and prospecting activities on site will fragment the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitation following disturbance events. Vehicle traffic generates substantial quantities of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species will be destroyed during the prospecting operation.

While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plant colonise disturbed areas or site, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to prospecting and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to prospecting activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the prospecting site and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The prospecting will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are relatively lower than mining-related activities.

The impact of load and haul activities is expected to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users. Impedance on nearby mining and related activities is not envisaged. If issues related to servitude are raised, compensation may be a form of mitigation to explore.

The prospecting operation, especially during construction, will create a limited number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the rural area will possibly impact on

safety and security of local residents. During the decommissioning and at closure of the prospecting, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after site closure is an associated potential impact although this will only be a prospecting operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the mine workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the mine, and that the economy will not decline to its original level prior to the development of this project. This is because the mine will generate substantial income for the regional and local economy, both directly and indirectly, during its life. It is difficult to predict the actual impact of the mine closure in advance, but it is acceptable to assume that the site closure will have a negative impact on the local and regional economy with a high probability of occurrence, a high severity and a high significance.

Alternative A is comparable to other alternatives. Impacts associated with Alternative A are the same to those associated with other alternatives. Positive impact includes employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

9.7.3 Decommissioning, Closure and Post-closure Phases

There is expected loss of job opportunities associated with decommissioning and closure of the proposed development. It is expected that there are going to be economic repercussions. Monitoring should continue for at least two (2) years post-closure.

9.8 The possible mitigation measures that could be applied and level of residual risk

Please refer to Table 13 for an indication on the manner in which effective mitigation measures, if implemented effectively are presented.

Table 13: Some Possible Management Actions

Issue and concern raised	Proposed management actions or alternative to address Issue	Impact significance of the possible management actions or alternative before and after management actions	
		Pre-mitigation	Post-mitigation
<p>Objection and Comment The proposed development is likely to lead to permanent damage with no prospects of full land restoration of the Property.</p>	<p>In terms of section 24P (1) of the National Environmental Management Act 107 of 1998, as amended, the financial provision is going to be in the form of Bank guarantee or Cash deposit into the DMRE Rehabilitation Trust account no. 40 6703 4181 (ABSA). Impedance on Tshipi Borwa Mine's operations is not envisaged as there are no Mining Rights issued in respect of Portion 20 of Farm Mamatwan 331.</p>	Low	Low

9.9 Motivation Where No Alternative Sites Were Considered

Due to the nature of the proposed development, the location of the facility is largely dependent on technical and environmental factors such as irrigation suitability, climatic conditions, solar irradiation and geology. The solar irradiation to which the Northern Cape Province is exposed indicates is indicative of potential for the solar power generation.

The locality of the prospecting operation is based on the location of the possible diamond, Iron, Manganese, Gemstone and Aggregate deposits that have been identified through a scan of the local geology and economic activities. There is therefore no other alternative with regard to the overall operation footprint as temporary and / or mobile infrastructure may be utilised. The location of the central prospecting site and associated infrastructure is primarily based on proximity to the access roads, proximity to the areas earmarked for prospecting and limited additional impact on the environment and heritage resource. The prospecting activities and methodologies associated with prospecting (i.e., open pits with concurrent or progressive rehabilitation) is the only economic viable method currently being used by the mining development fraternity. There is no alternative prospecting method for the prospecting for the said resources.

The receptiveness of the site to development includes the suitability of the area for the proposed Prospecting for Mineral Resources Project. The property, near Kuruman, John Taolo Gaetsewe District, Northern Cape, South Africa where the project is proposed to be located is considered favourable and suitable from a technical perspective due to the following characteristics:

- Climatic conditions: Climatic conditions are a factor to consider in determining whether or not the project will be viable from a socio-economic and environmental perspective as Prospecting for Mineral Resources Project, subsequently powered using solar energy is directly dependent on the annual direct solar irradiation values of John Taolo Gaetsewe District;
- Topographic conditions and geology: The area of application for the proposed Prospecting for Mineral Resources Project. The topographical landscape of the area within which the proposed development is going to be built relatively of low slope ensuring safety and low risk of loose rocks rolling down;
- Land accessibility and availability: The piece of land of the Portion 20 of Farm Mamatwan 331, near Kuruman, John Taolo Gaetsewe District, Northern Cape, South Africa is available for purposes of the proposed project. The main entrance gate of the farms face R380; and

- Environmental sensitivity: Environmentally, the proposed project location is regarded as relatively limited ecological sensitivity in respect of receiving environment.

9.10 If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such

The property(ies) for which applied are identified and specified in this report. The identification process is influenced by factors such as the following:

- Potential for availability of mineral deposits for which applied; and
- Other environmental aspects as presented in this Scoping Report.

9.11 A concluding statement indicating the preferred alternatives, including preferred location of the activity

Based on the criteria set above, the property, near Kuruman, John Taolo Gaetsewe District, Northern Cape, South Africa is he preferred location thus far because an application was lodged with the DMRE in respect of the property of interest.

10 A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including—

9.1 A Description of the Environmental Impacts and Risks Identified During the Environmental Assessment Process

This section describes potential impacts on environmental and socioeconomic pertaining to each of the fundamental project actions / activities, processes that will be followed and associated infrastructure that will be used in the proposed development (Please see Table 11).

Table 14: Environmental Impacts and Risks Identified throughout all phases of development

Activity/process or part thereof	Impacts (Pre-mitigation)
<ul style="list-style-type: none"> • Vegetation Clearance, Ground Levelling and Sterilisation of Mineral Resources • Infrastructure, posing safety risks to personnel and animals • Water use and management; Waste Management • Drilling, Pitting and Trenching, Stockpiling and associated activities (including services) • Climate Change-related occurrences and monitoring • Transport system • Concurrent or Progressive Backfilling (Rehabilitation) • Use of facilities and services • Restoration of destructed biodiversity 	<ul style="list-style-type: none"> Sterilisation of mineral resources Infrastructure, posing safety risks to personnel and animals Loss of soil and land capability affected through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Proliferation of Invasive and Alien Plant species Change in visual amenity Use of fertiliser Lowering of groundwater level Destruction of Aquifers Air pollution, greenhouse gas emissions, global warming & Climate Change Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Health and Safety Traffic Waste Agriculture Socio-economic impact Influx of labour Interference with existing land uses or authorised land uses in the vicinity of application area

<ul style="list-style-type: none"> Closure, post-closure alternative land uses 	Loss of job opportunities Economic impact Proliferation of Invasive and Alien Plant species
-----------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------

In an event the proposed development does not go ahead, an opportunity to acquire information about mineral resources underground. There are also socio-economic benefits that will be lost such as Tax collection by the South African Revenue Services, Employment, SMME development and Social and labour Plan projects if the proposed project reaches the issuing of Mining Right level, if applicable. A more comprehensive environmental risks and impacts is going to be identified at EIA phase.

9.2 An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures

The Draft Scoping Report presented herein is open for public review at his stage. A revised and final copy of this report is going to be submitted to the Competent Authority for approval after comments have been received from the proponent, the public community, government departments and the Competent Authority.

11 An assessment of each identified potentially significant impact and risk, including—

11.1 Introduction

This section presents outcomes of the assessment that was undertaken in giving regard to section 9.2 of this report.

Residual Impacts – Sterilisation of mineral resources.

Impact	Sterilisation of mineral resources				
Phase(s)	Planning, Construction, Operational and Decommissioning				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	1	1	Duration	3	2
Probability	4	4	Reversibility	3	3
Environmental Risk (pre-mitigation)					-9
Proposed Mitigation					
<ul style="list-style-type: none"> Ensure that the project design and associated layout seeks to minimise the project footprint, thus minimising the loss of agricultural land; engage with each directly affected landowner with the intention to acquire only the required servitude area; Ensure that optimal use is made of the available mineral resource through proper planning of the prospecting operations; 					

<ul style="list-style-type: none"> The prospecting should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources; Utilise mobile equipment, if possible; and, No dumping of materials prior to approval by exploration geologist who must promote best prospecting practises. 	
Environmental Risk (post-mitigation)	-8
Public Response	1
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	-12

Residual Impacts – Change in Topography

Impact	Changes to surface topography due to topsoil removal, drilling, excavations, pitting and placement of infrastructure and development of mine residue deposits				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	1	1	Duration	3	2
Probability	4	4	Reversibility	3	3
Environmental Risk (pre-mitigation)					-9
Proposed Mitigation					
<ul style="list-style-type: none"> Backfill all trenches/excavations continuously (progressive rehabilitation); Employ effective rehabilitation strategies to restore surface topography of excavations and plant site; Stabilise the residue deposits; and All temporary infrastructures will be demolished during closure. 					
Environmental Risk (post-mitigation)					-8
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					3
Prioritisation Factor					1.50
Degree of confidence in impact prediction					Medium
Significance Rating					-12

Residual Impacts - Loss of soil and land capability affected through physical disturbance.

Impact	Loss of agricultural land capability and infrastructure				
Phase(s)	Planning, Construction, Operational and Decommissioning				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	1	1	Duration	3	2
Probability	4	4	Reversibility	3	3
Environmental Risk (pre-mitigation)					-9
Proposed Mitigation					
<ul style="list-style-type: none"> Audits must be carried out at regular intervals to identify areas where erosion is occurring; All attempts must be made to avoid exposure of dispersive soils; 					

<ul style="list-style-type: none"> Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased. 	
Environmental Risk (post-mitigation)	-8
Public Response	1
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	-12

Residual impacts – Infrastructure, including movable items posing risks to personnel

Impact	Infrastructure, including movable items posing risks to personnel				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	4	4
Probability	3	3	Reversibility	3	3
Environmental Risk (pre-mitigation)					-8.25
Proposed Mitigation					
<ul style="list-style-type: none"> Implement the training programme; Appoint an independent Environmental Control Officer. 					
Environmental Risk (post-mitigation)					-8.25
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					3
Prioritisation Factor					1.50
Degree of confidence in impact prediction					Medium
Significance Rating					-12.38

Residual impacts – Destruction of biodiversity (physical).

Impact	Destruction of biodiversity (physical).				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	4	4
Probability	3	3	Reversibility	3	3
Environmental Risk (pre-mitigation)					-8.25
Proposed Mitigation					
<ul style="list-style-type: none"> The ECO must ensure that all contractors and workers undergo environmental induction prior to commencing with work on site; The environmental induction should occur in the appropriate languages for the workers who may require translation; Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert; Employ measures that ensure adherence to the speed limit; Vegetation clearance must be kept minimum; 					

<ul style="list-style-type: none"> Ensure that there is vegetation that is removed unnecessarily throughout all phases of the proposed development. 	
Environmental Risk (post-mitigation)	-8.25
Public Response	1
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	-12.38

Residual impacts – Destruction of biodiversity (general).

Impact	Destruction of biodiversity (general).				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	4	4
Probability	3	3	Reversibility	3	3
Environmental Risk (pre-mitigation)					-8.25
Proposed Mitigation					
<ul style="list-style-type: none"> Lighting of illumination must be monitored to ensure it does not exceed the threshold; Noise levels must be kept minimal; The ECO must ensure that all contractors and workers undergo environmental induction prior to commencing with work on site; The environmental induction should occur in the appropriate languages for the workers who may require translation; A walkabout on-site must be undertaken by a qualified specialist to verify findings of the Biodiversity Survey before operations resume; Employ measures that ensure adherence to the speed limit; Vegetation clearance must be kept minimum; Ensure that there is vegetation that is removed unnecessarily throughout all phases of the proposed development. 					
Environmental Risk (post-mitigation)					-8.25
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					3
Prioritisation Factor					1.50
Degree of confidence in impact prediction					Medium
Significance Rating					-12.38

Residual Impacts – Proliferation of Invasive and Alien Plant species.

Impact	Proliferation of Invasive and Alien Plant species				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	3	2

Spatial Scope	2	2	Duration	4	4
Probability	4	4	Reversibility	4	3
Environmental Risk (pre-mitigation)					-13
Proposed Mitigation					
<ul style="list-style-type: none"> Eradicate and control the spread of alien invasive species; Compile a working weed/alien plant management programme in collaboration with the Department of Environment, Fisheries and Forestry during Mining Right stage, if applicable; and Implement effectively the compiled weed/alien plant management programme. 					
Environmental Risk (post-mitigation)					-11
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					-14.63

Residual impacts – Change in visual amenities.

Impact	Visual Impact				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	4	4
Probability	3	3	Reversibility	3	3
Environmental Risk (pre-mitigation)					-8.25
Proposed Mitigation					
<ul style="list-style-type: none"> Infrastructure should be placed to optimise the natural screening capacity of the vegetation; Where practical, protect existing vegetation clumps during in order to facilitate screening during the prospecting operation; Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the prospecting site free from additional negative visual amenities; Locate the staff camps and the material stockpiles outside of the visual field of sensitive visual receptors; Dust suppression procedures should be implemented especially on windy days during earth works; Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species; Implement a management plan for the post-prospecting site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated. 					
Environmental Risk (post-mitigation)					-8.25
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					3
Prioritisation Factor					1.50
Degree of confidence in impact prediction					Medium
Significance Rating					-12.38

Residual impact – Aquatic Impact.

Impact	Aquatic Impact
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Phase(s)	Planning, Construction, Operational, Decommissioning and Post-Closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	2	2
Probability	3	2	Reversibility	2	2
Environmental Risk (pre-mitigation)					-6
Proposed Mitigation					
<ul style="list-style-type: none"> Sufficient care must be taken when handling hazardous materials to prevent pollution; Under no circumstances may ablutions occur outside the provided facilities; No uncontrolled discharges from the staff camps to any surface water resources shall be permitted; 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; Spill kits must be easily accessible and workers must undergo induction regarding the use thereof; 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 water courses within the area; 					
Environmental Risk (post-mitigation)					-4
Public Response					2
Cumulative Impacts					1
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					-5.32

Residual Impacts – Groundwater level.

Impact	Lowering of groundwater level				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	3	2
Spatial Scope	2	2	Duration	4	4
Probability	4	4	Reversibility	4	3
Environmental Risk (pre-mitigation)					-13
Proposed Mitigation					
<ul style="list-style-type: none"> Ensure boreholes do not run dry; Monitor water level on a monthly basis; Establish and implement a groundwater monitoring network. 					
Environmental Risk (post-mitigation)					-11
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					-14.63

Residual Impacts – Destruction of Aquifers and Groundwater pollution.

Impact	Destruction of Aquifers and Groundwater pollution
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Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	3	2
Spatial Scope	2	2	Duration	4	4
Probability	4	4	Reversibility	4	3
Environmental Risk (pre-mitigation)					-13
Proposed Mitigation					
<ul style="list-style-type: none"> • Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution; • Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site; • Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures; • All facilities where dangerous materials are stored must be contained in a bund wall; • De-watering must be undertaken in a manner that does not result in water pollution; • Vehicles and machinery should be regularly serviced and maintained; and • Conduct remediation (preferably bioremediation) of contaminated sites. 					
Environmental Risk (post-mitigation)					-11
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					-14.63

Residual impacts – Air pollution, greenhouse gas emissions, global warming, & Climate Change.

Impact	Air pollution, greenhouse gas emissions, global warming, & Climate Change				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	4	4
Probability	3	3	Reversibility	3	3
Environmental Risk (pre-mitigation)					-8.25
Proposed Mitigation					
<ul style="list-style-type: none"> • Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time; • Dust fall-out monitoring must be undertaken; • Service Trackless Mobile Machinery regularly; • The length of time where open areas are exposed should be restricted; • Prospecting should not be delayed after vegetation has been cleared and topsoil removed; • Control options pertaining to topsoil removal, loading and dumping must be monitored. 					
Environmental Risk (post-mitigation)					-8.25
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					3
Prioritisation Factor					1.50

Degree of confidence in impact prediction	Medium
Significance Rating	-12.38

Residual impact – Heritage/Cultural Resources.

Impact	Impact on Heritage/Cultural Resources.				
Phase(s)	Planning, Construction, Operational, Decommissioning and Post-Closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	2	2
Probability	3	2	Reversibility	2	2
Environmental Risk (pre-mitigation)					-6
Proposed Mitigation					
<ul style="list-style-type: none"> • If any heritage and cultural resources (e.g., graveyards, ruins, historic structures, fossils etc.) exist on-site, they must be protected and preserved by the delineation of a no-go zone if any of these areas are to be found in the prospecting area; • Stone tools should be avoided where possible and fresh exposure should be recorded before destruction; • All stone tool artefacts should be recorded, mapped and collected before destruction; • Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction; • Implement the Chance-Finds Protocol. 					
Environmental Risk (post-mitigation)					-4
Public Response					2
Cumulative Impacts					1
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					-5.32

Residual impact – Palaeontological Resources.

Impact	Impact on Palaeontological Resources.				
Phase(s)	Planning, Construction, Operational, Decommissioning and Post-Closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	2	2
Probability	3	2	Reversibility	2	2
Environmental Risk (pre-mitigation)					-6
Proposed Mitigation					
<ul style="list-style-type: none"> • If any palaeontological resources (e.g., fossils etc.) exist on-site, they must be protected and preserved by the delineation of a no-go zone if any of these areas are to be found in the prospecting area; • A qualified and suitably qualified specialist must be called to attend; • A sample must be collected and preserved; • Implement the Chance-Finds Protocol. 					
Environmental Risk (post-mitigation)					-4
Public Response					2

Cumulative Impacts	1
Degree of Potential Irreplaceable loss of resources	2
Prioritisation Factor	1.33
Degree of confidence in impact prediction	Medium
Significance Rating	-5.32

Residual impact – the proposed development is likely to develop local economy. Local suppliers will have gained experience and exposure to meeting standards of quality and scale that could be transferrable to business opportunities.

Impact	Multiplier impacts on the local economy				
Phase(s)	Planning, Construction, Operational and Decommissioning; Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	+1	+1	Severity	2	2
Spatial Scope	2	2	Duration	2	4
Probability	4	4	Reversibility	2	2
Environmental Risk (pre-mitigation)					+8
Proposed Mitigation					
<ul style="list-style-type: none"> • Development of a register of local SMMEs; • Linkages with skills development/ Small, Medium and Micro Enterprises (SMME) development institutions and other mining operations; • SMME skills development as part of mine SLP/LED commitments; • Create synergies with other mining/electricity enterprises LED/CSR projects; • Preference should be given to capable subcontractors who based within the local municipal area; • Align skills development to build capacity of SMMEs; • Monitoring of sub-contractors' procurement; • Development of a register of local SMME; • Local procurement targets should be formalised in Semba Isinyithi North procurement policy; • Preference should be given to capable subcontractors who based within the local municipal area; and <ul style="list-style-type: none"> • Measures recommended to maximise benefits from local employment, skills and economic development. 					
Environmental Risk (post-mitigation)					+10
Public Response					2
Cumulative Impacts					1
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					+13.3

Residual Impact – Improved economic development; Increased capacity to develop and maintain livelihood strategies.

Impact	Community development and Social Upliftment through LED projects				
Phase(s)	Planning, Construction, Operational and Decommissioning				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	+1	+1	Severity	1	3
Spatial Scope	2	2	Duration	2	4
Probability	2	4	Reversibility	1	3
Environmental Risk (pre-mitigation)					+3
Proposed Mitigation					

<ul style="list-style-type: none"> • Ensure that there is stakeholder buy-in; • Aligning LED projects with those of other development role-players; • Liaison with beneficiaries to ensure needs are met; • Collaboration with other developmental role players (e.g., local and district municipalities, neighbouring mines and NGOs) during implementation of envisaged projects, and where possible aligning envisaged development projects with existing ones; <ul style="list-style-type: none"> • Expanding its skills development and capacity building programmes for non-employees; • Monitoring system to regulate Historically Disadvantaged South African procurement; • Where feasible, training should be NQF Accredited; • A record of training courses completed per individual should be kept; and • Maximise benefits from local employment, skills and economic development. 	
Environmental Risk (post-mitigation)	+12
Public Response	2
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	+18

Residual Impacts - Increase in injuries and possible loss of lives.

Impact	Veldfires, Health and Safety				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	3	2
Spatial Scope	2	2	Duration	4	3
Probability	4	4	Reversibility	3	3
Environmental Risk (pre-mitigation)					-12
Proposed Mitigation					
<ul style="list-style-type: none"> • Access control to all project elements, including fencing; • Personal Protective Equipment for mine workers; • Notification of blasting schedules; • Blasting and storage of hazardous materials to adhere to prescribed regulation; • Measures suggested minimising the impact of flyrock on surrounding roads and structure; • Measures suggested in the Health Impact Assessment to minimize traffic related accidents; • Traffic calming measures to prevent speeding (e.g., speed humps); • Road maintenance; • Provide safe road crossing points and fencing of the main road and the mine site; • Community education to sensitize community members to potential traffic and blasting safety risks; • Traffic: <ul style="list-style-type: none"> • Unauthorised access: Unauthorised access to the mine site should be prevented through appropriate fencing and security; • Veld fires: <ul style="list-style-type: none"> ○ Prohibit open or naked fires on site; ○ Any work or hot work that is capable of starting a fire must be undertaken in an enclosed area and be monitored or supervised; ○ Compatibility tables must be used to store materials in order to avoid incidents such as explosions, fires, illnesses to mentions just a few; 					

<ul style="list-style-type: none"> ○ It is recommended that the making of fires by construction workers is restricted to areas where tight control can be exerted, or that the making of fires be prohibited; ○ Establish Fire Breaks that are up to standard, of no less than six (6) metres in width; ○ Ensure that the area where work is undertaken is surrounded by Firebreaks and that there are functioning and well-maintained fire hydrants in the vicinity to extinguish veld fires; ○ Establish and maintain relationship with Local Fire Prevention Associations; ○ Construct fire hydrants and associated infrastructure; ○ Formulate emergency preparedness and response procedures that employees have to be trained on; ● Community education: <ul style="list-style-type: none"> ○ It is recommended that a community awareness campaign be implemented in the surrounding communities to sensitise community members to traffic safety risks and the need to prevent children and animals from wandering into the mine site; ○ Increase awareness of the mine's complaints and grievance procedures; ○ Activities undertaken as part of awareness campaigns and mine communication programme should be recorded and reflected in a formal progress report compiled on a quarterly basis; ○ Mechanisms must be established to ensure that problems are dealt with promptly. In this regard, it is proposed that a community liaison officer be the primary resource; and ○ Regular feedback sessions should be arranged with community forums to assess the impact of this programme in terms of knowledge, attitudes and behaviour. 	
Environmental Risk (post-mitigation)	-10
Public Response	1
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	-15

Residual impact – Traffic-related infrastructure.

Impact	Traffic				
Phase(s)	Planning, Construction, Operational, Decommissioning and Post-Closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	2	2
Probability	3	2	Reversibility	2	2
Environmental Risk (pre-mitigation)					-6
Proposed Mitigation					
<ul style="list-style-type: none"> ● Ensure adherence to traffic rules; ● Display road traffic signs; ● Keep speed below 40 km/h. 					
Environmental Risk (post-mitigation)					-4
Public Response					2
Cumulative Impacts					1
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					-5.32

Residual Impacts – Noise and Vibration

Impact	Noise and Vibration
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Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	1	1	Duration	3	2
Probability	4	4	Reversibility	3	3
Environmental Risk (pre-mitigation)					-9
Proposed Mitigation					
<ul style="list-style-type: none"> Restrict prospecting activities to daytime unless agreements obtained to do 24hr operations; Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events; Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints; Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted. 					
Environmental Risk (post-mitigation)					-8
Public Response					1
Cumulative Impacts					2
Degree of Potential Irreplaceable loss of resources					3
Prioritisation Factor					1.50
Degree of confidence in impact prediction					Medium
Significance Rating					-12

Residual Impacts - Strain on the existing infrastructure which is already inadequate.

Impact	Increase pressure on the existing infrastructure				
Phase(s)	Planning, Construction, Operational and Decommissioning, Post-closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	3	2
Spatial Scope	2	2	Duration	4	4
Probability	4	4	Reversibility	4	3
Environmental Risk (pre-mitigation)					-13
Proposed Mitigation					
<ul style="list-style-type: none"> To limit, as far as reasonably possible, additional pressure on existing infrastructure and services; To work in partnership with government, industry, and relevant organisations to enhance the existing infrastructure and services; To liaise openly and frequently with affected stakeholders to ensure they have information about the proposed Semba Isinyithi North Prospecting Project; Liaison with district and local municipalities well in advance to ensure needs are met; Ensure that municipalities take into account expected population influx; Promotion of prospecting methods to allow for surface development; Influx management to make available, maintain and effectively implement a grievance/complaint register that is easily accessible to all neighbours and affected stakeholders; To limit, as far as reasonably possible, additional pressure on existing infrastructure and services; To work in partnership with government, industry, and relevant organisations to enhance the existing 					

<ul style="list-style-type: none"> • infrastructure and services; • To liaise openly and frequently with affected stakeholders to ensure they have information about the proposed Semba Isinyithi North Prospecting Project; and • To make available, maintain and effectively implement a grievance/complaint register that is easily accessible to all neighbours and affected stakeholders. 	
Environmental Risk (post-mitigation)	-11
Public Response	1
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	2
Prioritisation Factor	1.33
Degree of confidence in impact prediction	Medium
Significance Rating	-14.63

Residual impacts – Interference with existing infrastructure in the vicinity of the proposed prospecting right area.

Impact	Interference with existing infrastructure in the vicinity of the proposed prospecting right area.				
Phase(s)	Planning, Construction, Operational and Decommissioning				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	4	4
Probability	3	3	Reversibility	3	3
Environmental Risk (pre-mitigation)					-8.25
Proposed Mitigation					
<ul style="list-style-type: none"> • Implement a 100 m buffer between the proposed development and the existing mining activities in the vicinity; • Keep communication on-going between the landowner and the land user. 					
Environmental Risk (post-mitigation)					-8.25
Public Response	1				
Cumulative Impacts	2				
Degree of Potential Irreplaceable loss of resources	3				
Prioritisation Factor	1.50				
Degree of confidence in impact prediction	Medium				
Significance Rating	-12.38				

Residual Impacts - Loss of grazing land.

Impact	Loss of agricultural land capability and infrastructure				
Phase(s)	Planning, Construction, Operational and Decommissioning				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	1	1	Duration	3	2
Probability	4	4	Reversibility	3	3
Environmental Risk (pre-mitigation)					-9
Proposed Mitigation					

<ul style="list-style-type: none"> • Ensure that the project design and associated layout seeks to minimise the project footprint, thus minimising the loss of agricultural land; engage with each directly affected landowner with the intention to acquire only the required servitude area; • Should subsequent, possibly, Semba Isinyithi North Prospecting Project acquire the full farm and the project footprint only affects a portion of the land, the surrounding usable land should be utilised for agricultural purposes – potentially as part of a lease agreement; • Where damage is incurred, suitable compensation must be negotiated with the affected farmer; • Prepare a site Rehabilitation Plan that will be implemented as part of the decommissioning phase; and • Where damage is incurred, suitable compensation must be negotiated with the affected farmer. 	
Environmental Risk (post-mitigation)	-8
Public Response	1
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	-12

Residual impacts – the impact may be reversible over time as workers and job-seekers leave the area, consequences such as COVID-19 spread, HIV/AIDS and unwanted pregnancies will be permanent.

Impact	Increased social pathologies linked to influx of workers and job seekers				
Phase(s)	Planning, Construction, Operational and Decommissioning				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	4	4
Probability	3	3	Reversibility	3	3
Environmental Risk (pre-mitigation)					-8.25
Proposed Mitigation					
<ul style="list-style-type: none"> • Limit, as far as reasonably possible, social ills caused by influx of workers and job-seekers; • Liaise openly and frequently with affected stakeholders to ensure they have information about the Project; • Extensive COVID-19, HIV/AIDS awareness and general health campaign. It should be noted that Semba Isinyithi North Prospecting Project managers have no control over activities related to workers' behaviour, however It is recommended that COVID-19 and HIV/AIDS campaigns are conducted within the affected area; • Discourage influx of job-seekers by prioritising employment of unemployed members of local communities; • Liaise with Joe Morolong Local Municipality, and Traditional Authority to ensure that expected population influx is taken into account in infrastructure development and spatial development planning; • Create synergies with local government IDP and other companies' SLP/CSR projects, at Mining Phase, to promote infrastructure development; • Clear identification of workers – prevention of loitering; • Liaison with police or establish/ support community policing forum; • During mining phase, if feasible, promote projects providing housing, especially low-cost housing, to link with the proposed Semba Isinyithi North Prospecting Project; • Community education; • Compensate affected parties reasonably, if applicable and necessary; • Implement measures to address potential conflict between locals and non-locals; and • Develop, avail, maintain and effectively implement a grievance/complaint register that is easily accessible to all neighbours and affected stakeholders. 					

Environmental Risk (post-mitigation)	-8.25
Public Response	1
Cumulative Impacts	2
Degree of Potential Irreplaceable loss of resources	3
Prioritisation Factor	1.50
Degree of confidence in impact prediction	Medium
Significance Rating	-12.38

Residual impact – increase in nuisance.

Impact	Nuisance and Waste				
Phase(s)	Planning, Construction, Operational, Decommissioning and Post-Closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	2	2
Probability	3	2	Reversibility	2	2
Environmental Risk (pre-mitigation)					-6
Proposed Mitigation					
<ul style="list-style-type: none"> Perform dust suppression regularly on stockpiles, road networks and at material handling points, including crushing and screening; Topsoil stockpiles and Waste rock dumps must be covered; Collect waste from site at least once a month; Implement waste separation at source; The footprint must be limited as far as reasonably practicable. 					
Environmental Risk (post-mitigation)					-4
Public Response					2
Cumulative Impacts					1
Degree of Potential Irreplaceable loss of resources					2
Prioritisation Factor					1.33
Degree of confidence in impact prediction					Medium
Significance Rating					-5.32

Residual impact – Agriculture.

Impact	Impact on Agriculture				
Phase(s)	Planning, Construction, Operational, Decommissioning and Post-Closure				
Environmental Risk					
Attribute	Pre-mitigation	Post-mitigation	Attribute	Pre-mitigation	Post-mitigation
Nature	-1	-1	Severity	2	2
Spatial Scope	2	2	Duration	2	2
Probability	3	2	Reversibility	2	2
Environmental Risk (pre-mitigation)					-6
Proposed Mitigation					
<ul style="list-style-type: none"> Utilise environmentally-friendly products on the soil; The footprint must be limited as far as reasonably practicable. 					
Environmental Risk (post-mitigation)					-4
Public Response					2
Cumulative Impacts					1

Yone STEM Frontiers (Pty) Ltd

The Proposed Prospecting Right and associated Equipment, Machinery, Processes and Infrastructure and related Activities Project: Environmental Impact Assessment Report, near Kuruman, Northern Cape

Degree of Potential Irreplaceable loss of resources	2
Prioritisation Factor	1.33
Degree of confidence in impact prediction	Medium
Significance Rating	-5.32

12 A summary of the findings and recommendations of specialist reports complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report

The summary of specialist reports presented herein (see Table 15) is so done in respect of the proposed Project. There were no identified environmental fatal flaws in relation to the proposed development at the time of publishing the draft Environment Impact Assessment Report.

NB: The following specialist studies were recommended by the DEA screening tool, however ground truthing by the EAP deemed some of them not necessary

(a) Agricultural Impact Assessment:

The proposed prospecting activities are going to be undertaken a sandy and rocky area. Agricultural activities will not be affected by the proposed prospecting activity, as the prospecting activities are going to be undertaken over a relatively small area but in a scattered manner at this stage of the process. Perhaps, an Agricultural Impact Assessment is going to be necessary to undertake at Mining Right application stage, if applicable.

(b) Archaeological and Cultural Heritage Impact Assessment:

Considering that access to property was refused outrightly by the landowner, discussions between parties are going to continue after the Prospecting Right has been issued (if applicable), however, in the interim, an Archaeological and Heritage Chance Find Procedure (CPF) annexed to the Heritage Impact Assessment report will be applied as a manual for the protection of heritage resources which may occur on the property when prospecting commences.

The project site is on its archaeological secondary context as it has been affected by transformation of this area into human activities. However, Archaeological and Cultural Heritage Impact Assessment was undertaken on this proposed site, also see attached copy of the report. According to the Specialist findings it is stated that;

There is an established presence of Stone Age material in the broader area occurring as scattered distributions of artefacts, sometimes localised along the edges of streams and less likely on the sand-covered plains. Other heritage resources that might occur in the broader area are:

- Rock engravings (petroglyphs) dating from the Middle Stone Age to Later Stone Age periods;
- Rock Paintings from the Middle Stone Age to the Later Stone Age periods;
- Buildings and objects associated with modern commercial farming from the 19th century;
- Graves, burial grounds and human bones.

All necessitating impact mitigation measures will be in place during the operation of the prospecting activity.

(c) Palaeontology Impact Assessment:

The project site is on its archaeological secondary context as it has been affected by human settlement. However, Palaeontology Impact Assessment was undertaken, see the copy of the attached report. All necessitating impact mitigation measures will be in place during the operation of the prospecting activity with the implementation of the proposed Chance-Finds Protocol.

(d) Terrestrial Biodiversity Impact Assessment:

The EAP have expertise to identify terrestrial biodiversity using the available SANBI information on CBAs and ESAs, respectively. The project area is located within an open land with its portion occupied by buildings. Additionally, considering the small and scattered nature of the proposed activities, it is not sensitive. The EAP recommends strongly that all protected tree species must be left in-situ throughout all phases of the proposed development.

(e) Aquatic Biodiversity Impact Assessment:

The proposed prospecting activity is situated on an inland area and there is no watercourse that was identified in the area (if any, a 500 m buffer must be observed). It is recommended that a site walkabout must be undertaken to verify this observation before activities resume. The identified Vlermuisleegte is approximately 700 m away from the prospecting right application area. Therefore, Aquatic Biodiversity Impact Assessment will not be required in this proposed prospecting activity. At Mining Right application stage, if applicable, the Aquatic Biodiversity Impact Assessment may be undertaken.

(f) Noise Impact Assessment:

The proposed prospecting activity is regarded as relatively small-scale. The potential ambient noise emission to result from these prospecting activities will be below the permissible noise level. At Mining

Right application stage, if applicable, the Noise Impact Assessment may be undertaken as there is a community that lives within the application area.

(g) Radioactivity Impact:

The proposed prospecting activity will not require radioactive impact assessment, as it will not emit any radioactive substances of significant impact to the receiving environment.

(h) Plant Species Assessment:

All protected plant species must be left *in-situ*. Under no circumstances may these plant species be removed unless the necessary permit has been applied for and issued by the Northern Cape: Department of Agriculture, Environmental Affairs, Rural Development and Land Reform. Clearance of plant species will be limited to the demarcated area of activity within the prospecting right, and must not reach a scale whereby a listed activity is triggered.

(i) Animal Species Assessment:

Only a relatively small area (less than or equal to 2 hectares) at a time, although scattered, is going to be disturbed during drilling activities. The rest of the application is going to be available for animal species as a natural habitat. The project site is in on an open land, animals that can be seen on the proposed area are random wildlife species. However, the prospecting area will be demarcated during the operation.

Table 15: Summary of Specialist findings and recommendations

Conducted Study	Recommendations of Specialist	Inclusion of Specialist recommendations in the EIAR	Reference to the application section in the EIAR
Biodiversity Assessment	<p>The proposed prospecting will not give rise to different biodiversity impacts from those already occurring in the greater area but will result in an additional loss of natural vegetation and habitat. The continued clearing of <i>Vachellia erioloba</i> and <i>Vachellia haematoxylon</i> woodlands in the region is a cause for concern as the exact extent of this resource is unknown.</p> <p>Prior to any site activity taking place it is imperative that a walk-through survey is conducted by a registered ecologist to verify the information provided in this report, as the original sampling conducted on the site was done some years ago. The site is relatively homogenous, and the protected trees occur throughout. Tree density does change slightly with a change in vegetation community, but they are not restricted to certain areas of the site. The cumulative effects of development in this area exacerbate the potential risk of losing ecosystem function. It is likely that there will be residual impacts to the biodiversity in the area as a result of the planned development.</p> <p>Once the walk-through survey has been conducted the number of trees that will be lost from site as a result of this activity will be known, and which may then trigger a need to undertake an investigation into the requirement for a Biodiversity Offset. As this project is still the prospecting phase the requirement for, type and size of Biodiversity offset should be established prior to the mining application.</p>	X	Section 5 of PART B <i>APPENDIX D1</i>
Heritage Impact Assessment	In light of the findings of the desk assessment, the prospecting right application may be approved. The study is mindful that some important discoveries may be made during prospecting. If this happens, operations should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.	X	Section 5 of PART B <i>APPENDIX D2</i>
Palaeontology Impact Assessment (Desktop)	Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is no evidence in the satellite imagery and any potential fossil traps such as palaeo-pans or palaeo-springs occur below the sand, nonetheless, a Fossil Chance Find Protocol should be added to the EMP. If fossils are found by the environmental officer, or other responsible person once mining has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be low, so as far as the palaeontology is concerned, the project should be authorised	X	Section 5 of PART B <i>APPENDIX D3</i>
Social Impact Assessment	The findings of this report take into consideration the proposed Semba Isinyithi Prospecting Project's activities, location of the proposed Semba Isinyithi Prospecting Project, the baseline of the existing socio-economic environment, and the ultimate effect that the Project will have on this environment. It is clear that both the construction and operational phases are typically characterised by negative impacts – although these impacts are primarily as a consequence of the various types of activities that take place during construction phase and because this particular phase is limited to approximately 1 year, anticipated to be mostly temporary in nature.	X	Section 5 of PART B <i>APPENDIX D4</i>

	<p>None of these negative impacts are considered irreversible or expected to cause irreplaceable damage to the socio-economic environment. In contrast, the operational phase, is considered to bring about more positive impacts that are, similarly, expected to last for the duration of Project life (5 years renewable). These impacts mostly relate to the sustainable development of not only the local economy, but also the region as a whole (through an increase in the national tax base).</p> <p>The proposed Semba Isinyithi Prospecting Project area is already in the vicinity of medium to large-scale mining and agricultural operations, and a number of existing tourist facilities that continue to operate. Influx associated with these industries is common and is likely to continue as a result of this Project, generating increased pressure on the already strained infrastructure and services, exacerbating the growth of informal settlements and aggravating social ills (such as stock theft COVID-19 and HIV/AIDS). In combination, the noise, air quality, visual, traffic and increase in influx will further degrade the overall sense of place. With effective implementation of the proposed mitigation measures, it is expected that the significance of the social impacts will be reduced to levels that are considered to be acceptable in the context of the receiving environment.</p> <p>Therefore, the impacts of the construction phase that are relatively short-term and mostly limited to the local area, will be outweighed by the more longer-term, widespread positive impacts of the operational phase. Adequate mitigation measures are expected to reduce the significance of negative impacts to acceptable levels, while positive impacts will be enhanced in order to maximise benefits to surrounding settlements.</p>		
<p>Aquatic Assessment</p>	<p>No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation. All prospecting activities should be performed in a that applies the principle of avoidance, management, mitigation and rehabilitation.</p> <p>All protected plant species must be identified, demarcated and be left in-situ. Should any prospecting activities take place within Vlermuisleegte Riparian Zone, a riparian zone offset area must be identified before proceeding with operations. The applicant needs to develop and/or update their approved Environmental Management Program/ Plan which describe in detail how identified impacts will be managed on site to ensure that impacts are minimized. All hydrocarbon storage tanks used on-site should be self-bunded and roofed. A walkdown the site is necessary to undertake to verify the findings of the specialist investigation before activities resume.</p> <p>The applicant must, throughout all development phases, ensure adherence to the principle of avoidance, management, mitigation and rehabilitation measures of impact on the receiving surface water environment. If chemicals are going to be used in the treatment process on-site, pollution control dams must be lined adequately at Mining Right, if applicable.</p>	<p>X</p>	<p>Section 5 of PART B APPENDIX D5</p>

13 Environmental Impact Assessment

All potentially significant socio-economic and environmental impacts that are associated with the proposed development have been identified in the Scoping and Environmental Impact Assessment Report presented herein. However, these impacts are going to be revised before the submission of final Scoping and Environmental Impact Assessment Report copy to the Competent Authority.

13.1.1 A summary of the key findings of the environmental impact assessment

In an attempt to provide information in respect of the findings of the Environmental Impact Assessment undertaken so far, the key findings of this assessment include the following:

- Biodiversity Impact Assessment:
 - There are protected tree species that were identified on site that must be left *in situ*;
 - In an instance the identified protected plant tree species are going to be removed, the proponent must first acquire the necessary permits, licenses and authorisations from the Northern Cape: Department of Agriculture, Environmental Affairs, Rural Development and Land Reform;
 - The proponent must implement the recommendations that were made by the Biodiversity Assessment Specialist;
 - The proposed prospecting will not give rise to different biodiversity impacts from those already occurring in the greater area but will result in an additional loss of natural vegetation and habitat;
 - The continued clearing of *Vachellia erioloba* and *Vachellia haematoxylon* woodlands in the region is a cause for concern as the exact extent of this resource is unknown.
 - Prior to any site activity taking place it is imperative that a walk-through survey is conducted by a registered ecologist to verify the information provided in this report, as the original sampling conducted on the site was done some years ago. The site is relatively homogenous, and the protected trees occur throughout. Tree density does change slightly with a change in vegetation community, but they are not restricted to certain areas of the site;

- The cumulative effects of development in this area exacerbate the potential risk of losing ecosystem function. It is likely that there will be residual impacts to the biodiversity in the area as a result of the planned development;
- Once the walk-through survey has been conducted the number of trees that will be lost from site as a result of this activity will be known, and which may then trigger a need to undertake an investigation into the requirement for a Biodiversity Offset;
- As this project is still the prospecting phase the requirement for, type and size of Biodiversity offset should be established prior to the mining application.
- Heritage and Cultural Resources:
 - The proponent must
- Impact on authorised activities on pieces of land that are adjacent to the prospecting right application area;
 - The proponent must establish a communication platform with the landowner;
 - Both parties (the proponent and the land owner) must ensure that none of the authorised land uses are interrupted unfairly;
 - The proponent must comply with the financial provisions presented in the report and approved by the Competent Authority;
 - The proponent must establish and implement a dust fallout monitoring programme;
 - Ensure that access to Portion 20 of Farm Mamatwan 331 is granted by the landowner;
- Social Impact Assessment:
 - The applicant must prioritise recruitment of labour from the local communities;
 - Business opportunities must consider local SMME's.
- Aquatic Assessment:
 - No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation. All prospecting activities should be performed in a that applies the principle of avoidance, management, mitigation and rehabilitation.
 - All protected plant species must be identified, demarcated and be left in-situ. Should any prospecting activities take place within Vlermuisleegte Riparian Zone, a riparian zone offset area must be identified before proceeding with operations.

The potential cumulative impacts associated with the proposed development are presented in Table 16.

Table 16: Summary of potential cumulative impacts

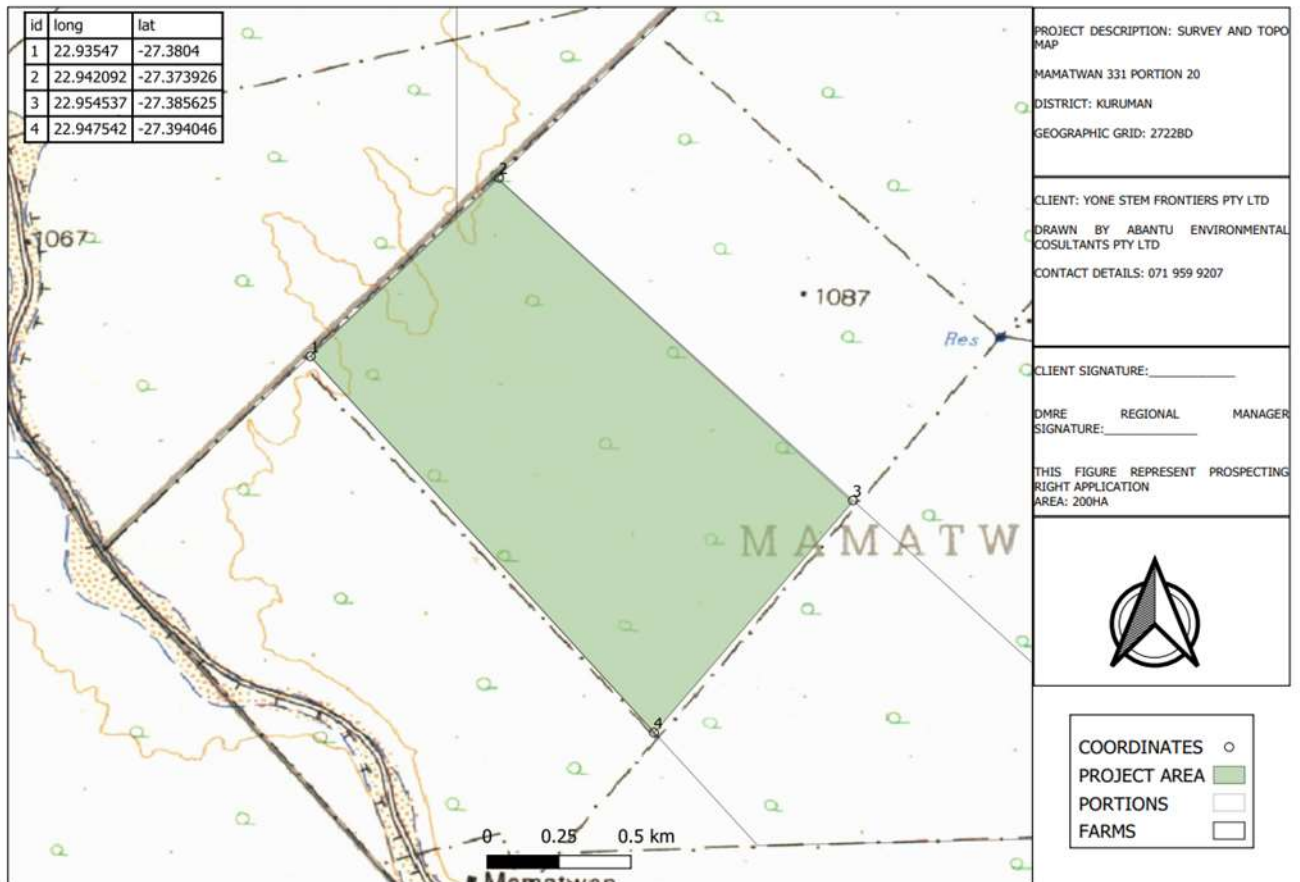
ASPECT	Potential Impact	Significance of the Impact (the significance ratings negative unless specified otherwise)	
		(Pre-mitigation)	(Post-mitigation)
Geology	Loss and sterilisation of mineral resources	Low	Low
Topography	Hazardous excavations and infrastructure resulting in safety risks to third parties and animals	Low	Low
Soil and land capability	Loss of soil resources and land capability through Contamination	Low	Low
	Loss of soil resource and land capability through physical disturbance	Low	Low
Biodiversity	Physical destruction of biodiversity	Low	Low
	General disturbance of biodiversity	Low	Low
Surface Water	Alteration of natural drainage patterns	Low	Low
	Contamination of surface water resources	Low	Low
Groundwater	Contamination of groundwater resources	Medium	Low
	Lowering of groundwater levels and reducing Availability	Medium	Low
Air Quality	Air pollution and Global Warming	Medium	Low
Noise and Vibration	Increase in disturbing vibration & noise levels	Medium	Low
Adjacent land uses	Impact on authorised land uses on adjacent properties	Medium	Low
Visual	Negative visual views	Low	Low
Heritage and Palaeontology	Loss of heritage/cultural resources	Low	Low
	Loss of palaeontological resources	Low	Low
Socio-economic	Inward migration	Low	Low
	Economic impact	Low	Low
Health and Safety	Deterioration of health and decrease in safety	Low	Low

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Land Use	Change in land use	Low	Low
Traffic	Road disturbance and traffic safety	Low	Low
Wetlands	Disturbance of Wetland and Riparian Zone	Low	Low
Waste	Pollution	Low	Low
Alien invasive plants	Proliferation of alien invasive plants species	Low	Low

13.2 Final Site Map



13.3 A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Table 17: Environmental Impacts and Risks Identified throughout all phases of development

Activity/process or part thereof	Impacts (Pre-mitigation)
<ul style="list-style-type: none"> • Vegetation Clearance, Ground Levelling and Sterilisation of Mineral Resources • Infrastructure, posing safety risks to personnel and animals • Water use and management; Waste Management • Drilling, Pitting and Trenching, Stockpiling and associated activities (including services) • Climate Change-related occurrences and monitoring • Transport system • Concurrent or Progressive Backfilling (Rehabilitation) • Use of facilities and services • Restoration of destructed biodiversity 	<p>Sterilisation of mineral resources Infrastructure, posing safety risks to personnel and animals Loss of soil and land capability affected through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Proliferation of Invasive and Alien Plant species Change in visual amenity Use of fertiliser Lowering of groundwater level Destruction of Aquifers Air pollution, greenhouse gas emissions, global warming & Climate Change Loss of heritage/cultural and palaeontological resources Influx of labour Wetlands Health and Safety Traffic Waste Agriculture Socio-economic impact Influx of labour Interference with / impedance on existing land uses</p>
<ul style="list-style-type: none"> • Closure, post-closure alternative land uses 	<p>Loss of job opportunities Economic impact Proliferation of Invasive and Alien Plant species</p>

14 Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed [impact management objectives, and the] impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation

Based on the assessment and where applicable the recommendations from specialist reports to be generated, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Specific environmental objectives to control, remedy or stop potential impacts emanating from the project are provided in Table 18.

Table 18: Environmental Objectives and Outcomes

Aspect	Environmental Objective	Expected Outcome
Geology	To prevent unnecessary mineral sterilisation	Avoidance of unnecessary mineral sterilisation
Topography	To prevent physical harm to third parties and animals from potentially hazardous excavations and infrastructure	To maintain natural topography as far as reasonably practicable, ensure the safety of people and animals
Soil and land capability	To prevent soil pollution and to minimise the loss of soil resources and related land capability through physical disturbance, erosion and compaction	To handle, manage and conserve soil resources to be used as part of rehabilitation and re-establishment of the pre-mining land capability
Biodiversity	To prevent the unacceptable disturbance and loss of biodiversity and related ecosystem functionality through physical and general disturbance	To limit the area of disturbance as far as reasonably practicably possible
Surface Water	To prevent unacceptable alteration of drainage patterns and related reduction of downstream surface water flow and to prevent pollution of surface water resources	To ensure surface water quality remains within acceptable limits for both domestic and agricultural purposes (where relevant). To ensure that the reduction of the volume of run-off into the downstream catchment is limited to what is necessary and that natural drainage patterns are re-established as part of rehabilitation.

Groundwater	To prevent pollution of groundwater resources and related harm to water users and to prevent losses to third party water users.	To ensure groundwater quality remains within acceptable limits for both domestic and agricultural purposes. To ensure that groundwater continues to be available to current users.
Air Quality	To prevent air pollution and lower impact on global warming.	To ensure that any pollutants emitted as a result of the project remain within acceptable limits.
Noise and Vibration	To prevent public exposure to disturbing vibration & noise	To ensure that any vibration and noise generated as a result of the project remains within acceptable limits.
Visual	To limit negative visual impacts	To ensure visual views that complement the surrounding environment
Aspect	Environmental Objective	Expected Outcome
Heritage and Palaeontology	To minimize the disturbance of palaeontological and heritage Resources	To protect heritage resources, where possible If disturbance is unavoidable, then mitigate impact in consultation with a specialist and the SAHRA and in line with regulatory requirements
Existing land uses (adjacent property)	To minimise impedance on lawful activities on the properties in the vicinity of prospecting right application area.	To ensure that there is no impedance on the mining activities that take place in the vicinity of prospecting right application area, if any, they are minimised.
Socio-economic	To limit inward migration and related social impacts and enhance positive economic impacts	To work together with existing structures and organisations and to establish and maintain a good working relationship with surrounding communities, local authorities and land owners
Health and Safety	To prevent impact on health and safety of personnel	Maintain good health and safety of personnel
Land Use	To prevent unnecessary negative impacts on surrounding land uses	To co-exist with existing land uses To negatively impact existing land uses as little as possible
Traffic	To prevent transport related accidents and/or injury to people and livestock.	To ensure the operation's use of public roads is one in a responsible manner.
Wetlands	To prevent destruction of wetlands	To ensure wetlands remain "alive" especially considering that South Africa, the Northern Cape Province is water scarce.

Waste	To prevent pollution of the environment	To ensure waste generation and disposal are avoided, where possible.
Alien invasive plants	Proliferation of alien invasive plants species.	Eradicate, and control the spread, of alien invasive species.

14.1.1 Heritage Impact Assessment, inclusive of Palaeontological Impact Assessment (Desktop Study)

A Palaeontological Impact Assessment (Desktop) was conducted for the proposed Prospecting for Mineral Resources Project, which is located near Kuruman, JTG District, Northern Cape Province. In order to comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed project. The palaeontological sensitivity of the area under consideration was presented. As part of the palaeontological context, information on fossils, among others, were presented.

A Heritage Impact Assessment was undertaken in terms of Section 38 of the National Heritage Resources Act (Act No. 25 of 1999). The heritage sensitivity of the property was assessed in terms of Stone Age, the Iron Age, Historical structures and Burial grounds among others.

14.1.2 Biodiversity Assessment Study

The Biodiversity Assessment was conducted in order to identify sensitive biodiversity areas and protected fauna and flora on the site. A comprehensive investigation was undertaken to identify potential floral species of special concern, this includes all IUCN listed species, TOPS listed species and species listed in schedule 1 and 2 of the NCNCA among others. The study may propose protection of certain sensitive areas such as wetlands and pans (among other) on site. The report and survey must comply with the NEMA Appendix 6 requirements.

14.1.3 Aquatic Assessment

The Aquatic Assessment was undertaken in order to delineate Vlermuisleegte Riparian Zone. No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer

zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation).

14.1.4 Social Impact Assessment

The Social Impact Assessment was undertaken as part of the specialist studies for the proposed Project. The SIA will identify and assess the negative and positive social impacts (including cumulative impacts and social risks) associated with the proposed Project and develop feasible measures to avoid, mitigate and / or enhance these impacts. The findings of the SIA were incorporated into the Environmental Impact Assessment and Environmental Management Programme for the proposed Project.

National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended requires the identification, prediction and evaluation of the impact of specified projects on the environment, socio-economic conditions and cultural heritage of a local area through all project cycles (including construction, operations and closure) with a view to minimising negative impacts and maximise project benefits. The 'polluter pays principle' also applies namely that the costs of remedying pollution, environmental degradation and consequent health effects must be paid for by culprits.

In the 2002 Johannesburg Declaration on Sustainable Development, the on-going threats facing our planet were detailed, which include among others, loss of biodiversity, desertification of fertile land and water pollution. The alarming statistics on increasing environmental degradation is a result of numerous contributing factors such as disharmony in the relationship between humanity and the earth, the cumulative impact of many minor human acts, and the emphasis on specialisation, thereby ignoring other contributing factors to the total challenge or problem. In the National Environmental Management Act, 1998 (Act No. 107 of 1998), the concept of "sustainable development" is defined in section 1 to mean- "...the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations".

15 The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment

No site layout alternatives were considered to be the most preferred at the final stage of compiling this report because the ecology of site A and B are, to a great level, relatively similar.

16 Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation

The applicant must comply with all pieces of legislation and accompanying regulations that apply to environmental affairs.

The recommendations, if any, on aspects for inclusion as conditions of the authorisation that were made by specialists were commissioned should be considered.

A consideration that this application is in respect of a proposed prospecting project, plant location may be change during any phase of the project development.

No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation).

All prospecting activities should be performed in a that applies the principle of avoidance, management, mitigation and rehabilitation.

If any prospecting activities are to take place within the delineated riparian zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Human Settlements, Water and Sanitation (DHSWS) in terms of Section 21 of the National Water Act (Act No. 36 of 1998).

All protected plant species must be left *in-situ*, alternatively the applicant must apply to obtain the applicable permits and authorisations before removal of protected plant species.

The prospecting and mining application can be considered with guarantees provided that the rock engravings are protected with the proposed 200 m buffer around them. As a standard precaution, in the

event of other heritage resources being discovered in future phases of the project, the Provincial Heritage Resources Authority or the SAHRA must be alerted immediately and an archaeologist or heritage expert called to attend.

Implement Chance Find Protocol or Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

- a. The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.
- b. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- c. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figures 4-6). This information will be built into the EMP's training and awareness plan and procedures.
- d. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- e. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
- f. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- g. If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- h. If no fossils are found and the excavations have finished then no further monitoring is required.

17 A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed

Uncertainties form part of any proposed development pertaining to the accuracy of the actual degree of impact on the environment that the proposed development will have. This report was compiled by incorporating information provided by the applicant and the various project specific employees/directors and no warranty or guarantee, whether expressed or implied, is made by the EAP with respect to the completeness, accuracy or truth or any aspect of this document with reference to the instructions, information and data supplied by the aforementioned parties. This piece of work may be amended to incorporate recommendations pertaining to Assumptions, Uncertainties and Gaps in Knowledge if necessary.

The impact assessment was conducted based on the EAP's knowledge and experience. The probability, intensity/severity and significance pertaining to the criteria used to assess the significance of the impacts were based more on rule-of-thumb and experience.

The Heritage Impact Assessment or study is based on an intensive search through existing literature for data on the heritage sensitivity of the broader area around Hotazel, Kathu and Kuruman. Heritage Impact Assessment studies conducted in the area are the principal source of information. These reports have been carefully selected considering factors such as distance from the property under study. Using this information, the potential yield of the target area could be reasonably predicted by extrapolation. Extrapolation is a scientific method of building a hypothesis by estimating or predicting results by assuming that what is known and has been established about a particular situation is likely to apply more or less for a neighbouring area/quantity that is unknown.

The author has conducted several heritage impact assessment studies on properties in the vicinity of Kuruman, Kathu and Olifantshoek.

Matenga, E. 2020. *Phase I heritage impact assessment (including palaeontological desk assessment) in terms of Section 38 of the National Heritage Resources Act No 25/1999 for the proposed prospecting and mining right on the Farms Titanic 773 and Gasesa 272 near Kuruman, Northern Cape Province.*

Titanic and Gasesa lie 30 and 10 km respectively northeast of Hotazel. Findings included lithics comprising scrapers, blades cores and flakes recorded in twenty-three (23) places representing all three epochs. The occurrence of these artefacts along the Matlhwareing River is a pattern consistent with findings of other studies in the broader area (Kusel 2018). An Early Stone Age pear-shaped hand-axe was found. Farm buildings were also noted on the property.

Matenga, E. 2020. *Phase 1 Heritage Impact Assessment Requested in Terms of Section 38 of the National Heritage Resources Act No 25/1999 for the Proposed Prospecting and Mining Right on the Farm Gamolilo 72 near Kuruman, Northern Cape Province*

The farm Gamolilo is situated 42 km NE of Mamatwan. Background scatters of lithics comprising scrapers, blades cores and flakes were recorded in 21 places (sites) dating from the Early Stone Age through the Middle Stone Age to the Late Stone Age. Among these finds were rock engravings (petroglyphs) a recommendation of which was made to protect them. Farm buildings were flagged as contributing to landscape elements associated modern commercial farming.

Matenga, E. 2021. *Phase I Heritage Impact Assessment & Palaeontological Desk Assessment for a Mine Prospecting Application on the Farms Gamahuli, Malley & La Rochelle near Olifantshoek, under the Gamagara Local Municipality, Northern Cape Province*

La Rochelle is lies 25 km west of Mamantwan, while Gamahuli and Malley are 50 km SW to the SW. Two burial grounds of a 19th-20th century date were recorded.

Matenga, E. 2021. *Heritage Impact Assessment in terms of Section 38(8) of the National Heritage Resources Act (No 25/1999) for the Proposed Agricultural Development (Hydroponics Systems Project) on the Remaining Extent of the Farm Marsh Near Kathu, Northern Cape.*

The farm Marsh 467 is 10 km north of Kathu and 23 km south of Mamantwan. Scatters of lithics comprising a few scrapers and significantly many flakes were recorded. While the area around Kathu has a significant Early Stone Age footprint, the finds on the farm Marsh 467 appear to date to the Middle Stone Age, and none of the of the ESA type tools were found.

Matenga, E. 2023. *Phase 1 Heritage Impact Assessment & Palaeontological Assessment (Desktop) for a Mine Prospecting Application on the Farm Perth 343 near Hotazel in the Joe Morolong Local Municipality, Northern Cape.*

The farm Perth lies 75 km north of Mamatwan. Stone Age material was sparsely distributed and confined to an ironstone ridge. There was an occasional hand-axe probably dating to the transition from the Early Stone Age to the Middle Stone Age. Scrapers and blades also recorded date from the Middle Stone Age to the Late Stone Age periods. There were old farm buildings dating from the early 20th century.

On the other hand, several studies in support of Heritage Impact Assessments in the broader area have recorded occurrences of artifacts dating from the Early Stone Age (ESA) through the Middle Stone Age (MSA) to the Late Stone Age (LSA), with a majority falling under the MSA/LSA periods. Generally, finds occur as scatters of scrapers, blades and cores while concentrated finds which may represent manufacturing sites or settlements are rare.

Pelser, A J. and A C Vollenhoven. 2011. *A report on a Heritage Impact Assessment (HIA) for a Proposed New Rail Crossing over the Gamagara River for the Gloria Mine Operations, Assmang Black Rock, on Gloria 266, North of Hotazel, Northern Cape.*

The site of bridge across the Gamagara River is 5 km NW of Hotazel. Fourteen (14) Stone Age sites were recorded. The railway bridge across the Gamagara River was considered of historic significance (page 15).

Fourie, W. 2015. *The proposed upgrade of the 66kV network in the Kuruman area, Northern Cape Province (PGS Heritage)*

The report concerned a heritage survey along the servitude of a proposed Eskom power line from Kuruman to Hotazel passing north of the farm La Rochelle. Two cemeteries, several historic farmsteads, historic asbestos mines, a sacred site, a Provincial Monument and a memorial were recorded. No Stone Age finds were reported (p. iv).

Mlilo, T. & F Bandama. 2016 *Phase 1 Archaeological Impact Assessment Report for Proposed John Taole Gaetsewe School and Hostels on Portion 0 of the Farm Motiton 509 HM in Dithakong, Joe Morolong Local Municipality, Northern Cape Province*

The proposed development was located in Dithakong Village about 100 km to the NE of Mamantwan. Dithakong has an eventful history as a 19th century village with stone walls. It was the theatre of fighting during the Difaqane and the war of resistance to colonial occupation. No archaeological or historical relics were found during the survey, although Stone Age relics had been reported in the vicinity (page 24).

PGS. 2018. *Proposed Waste Rock Dump Project at Tshipi Borwa Mine, near Hotazel, Northern Cape Province.*

The proposed infrastructural development was located on the Farm Mamatwan 331 and Moab 700. This is an adjacent property situated on the south side. No archaeological or historical relics were found within the footprint of the proposed development (page v).

Kusel, U. 2018. *East Manganese: Phase 1 Heritage Impact Assessment on the farm East 270 (Portion 1 & Re) within the John Taolo Gaetsewe District Municipality, Northern Cape.* The heritage study was undertaken in the vicinity of Hotazel. Stone tools were found in the vicinity of the Ga-Mogara River (a tributary of the Matlharing, the latter flows through the property of the present study). The lithics represented all three periods of the Stone Age with a few cutting tools typical of the Early Stone Age (ESA). A majority of lithics such as blades, a knife (exhibiting secondary trimming or retouch), and triangular flakes are typical of the Middle Stone Age (pp. 22-23).

Schalkwyk, J. A. 2020. *The development of a power line, access road and above ground storage of LPG gas as part of the Proposed Kagiso Solar Power Plant on the Remaining Extent of the Farm Kameelaar No 315 Registration Division Kuruman, Northern Cape Province.*

The footprint of the development lies south of Hotazel. No heritage finds were reported.

A potential limitation associated with the sampling approach is the narrow temporal window of sampling undertaken as part of the field work. Ideally, the site should be visited several times during different seasons to ensure that the full complement of plant and animal species present are observed, recorded and reported. However, this is rarely possible due to time and cost constraints. The information presented in this piece of work represents the dry/Winter season study. The present area of application presents an advantage for identification of plant species throughout the year because it along the Gamogara River and therefore is not as dry as the rest of the Northern Cape Province. A full plant species list was compiled

for the site from the site visit; this was complemented by a list of any listed species which are known from other studies to occur in the broad vicinity of the site. The lists of amphibians, reptiles and mammals for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach that takes account of the study limitations.

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the lavas, sandstones, shales and sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material. The sands of the Quaternary period would not preserve fossils but might cover traps (palaeo-pans or palaeo-springs) although no such feature is visible in the satellite imagery.

17.1 Environmental Impact Assessment Limit

The impact assessment was conducted based on the EAP's knowledge and experience. The probability, intensity/severity and significance pertaining to the criteria used to assess the significance of the impacts were based on the criteria set out in this report, rule-of-thumb and experience.

17.2 Heritage / Cultural and Palaeontological Resources

All possible care was taken to identify and document heritage resources during the survey in accordance with best practices in archaeology and heritage management. However, it is always possible that some hidden or subterranean sites are overlooked during a survey. The Consultant and / or Specialists will not be held liable for such oversights and additional costs thereof.

There was an extensive, thick and almost impenetrable *swarthaak* (black thorn) vegetation in the southern part of the farm and isolated areas in other parts of the farm.

The commissioned Palaeontological Impact Assessment (Desktop Study) that was commissioned did not cover the following:

- Where necessary, site visits by a qualified palaeontologist to locate any fossils and assess their importance (not applicable to this assessment);
- Where appropriate, collection of unique or rare fossils with the necessary permits for storage and curation at an appropriate facility (not applicable to this assessment); and

- Determination of fossils' representativity or scientific importance to decide if the fossils can be destroyed or a representative sample collected (not applicable to this assessment).

17.3 Biodiversity Assessment

Access to the property was not granted by the landowner for this survey. The property has however previously been surveyed in 2008 by the author, and information on original species composition and habitat have been extracted from the sample data collected during the 2008 survey. As the property borders a public road, the site was observed from the road to determine if any significant changes could be noted. The original survey was completed prior to the development of the Tshipi Borwa Mine and therefore it provides a comprehensive picture of what could be expected prior to any disturbance and so presents a good baseline for the biodiversity data. As the mine has been operational for some time one would expect disturbance factors to have already impacted the biodiversity on the proposed prospecting right. A full plant species list was compiled for the site from the site survey (2008), this was complemented by a list of any listed species which are known from other studies to occur in the broad vicinity of the site. The lists of amphibians, reptiles and mammals for the site are based on those observed at the site during the previous survey as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach that takes account of the study limitations.

17.4 Aquatic Assessment

On-site assessment could not be undertaken as access to the property was not granted by the landowner. The site visit to Vermuisleegte was undertaken in August during a dry season when some of the species could not be identified.

17.5 Socio-Economic Impact Assessment

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of receiving environment within the scope of this study as follows:

- This report and assessment are dependent on the accuracy of the publicly available secondary information; such as Statistics South Africa (StatsSA, 2011 and community survey, 2016). Where possible, the information was verified during a site visit. The data was considered sufficient for the purpose of this study;

- The study is based on data obtained from the community survey, 2016, which may not reflect accurate information;
- Not every individual in the community could be interviewed therefore only key people in the community and meeting attendees were approached for discussion;
- It should be noted that the social environment is a dynamic, constantly changing entity. It is therefore not always possible to predict all social impacts to a very high level of accuracy. Care has been taken to identify the most likely and significant impacts in the most appropriate way for the current local context;
- Social impacts can be experienced by affected communities on an actual or a perceptual level. It is therefore not always possible to quantify social impacts properly;
- It should be noted that predictions concerning the characteristics of the receiving socio-economic environment at the time of decommissioning are subject to a large margin of error, thus significantly reducing the accuracy of impact assessment- the specialist has attempted to assess (where possible) the impact during the decommissioning phase; and
- Individuals' view possible social impacts differently due to their association with the anticipated impact. Impacts could therefore be perceived and rated differently than those contained in the other reports. Further public participation can be used to refine findings.

18 A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation

18.1 Reasons why the activity should be authorized or not

Mining/Prospecting is one of the most important economic activities in the Northern Cape. There are no significant reasons why the activity should not be authorized. However, if the proposed management and mitigation measures are not properly applied or if the prospecting/mining operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the prospecting operation complies with the conditions set out in the approval of the EMPr.

18.2 Conditions that must be included in the authorisation

Apart from ensuring that the necessary permits are obtained for restricted activities, all recommendations and mitigation measures as set out in the EMPr should be adhered to or other reasonable mitigating measures, including conditions of the Environmental Authorisation (if granted) should be implemented.

No prospecting activities should take place within the delineated riparian zone as well as the proposed buffer zones unless the necessary authorisation and exemptions / licenses have been obtained from the Responsible Authority (Department of Human Settlements, Water and Sanitation);

All prospecting activities should be performed in a that applies the principle of avoidance, management, mitigation and rehabilitation;

If any prospecting activities are to take place within the delineated riparian zones, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Human Settlements, Water and Sanitation (DHSWS) in terms of Section 21 of the National Water Act (Act No. 36 of 1998);

All protected plant species must be left in-situ, alternatively the applicant must apply to obtain the applicable permits and authorisations before removal of protected plant species.

The prospecting and mining application can be considered with guarantees provided that the rock engravings are protected with the proposed 100 m buffer around them. As a standard precaution, in the event of other heritage resources being discovered in future phases of the project, the Provincial Heritage Resources Authority or SAHRA must be alerted immediately and an archaeologist or heritage expert called to attend.

A 100 m buffer is proposed at this stage between the existing mining operations and the proposed development.

18.2.1 Specific Conditions for Inclusion in the EMPr

Please refer to Sections 26.5.1; 26.5.2; 26.5.3 and 29 of Part B of this piece of work.

18.2.2 Rehabilitation Requirements

Please refer to Sections 26.5.1; 26.5.2; 26.5.3 and 29 of Part B of this piece of work.

19 Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised

Environmental Authorisation is required for a minimum 5 years.

20 An undertaking or affirmation by the EAP in relation to [-]:-

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Report.

20.1 The correctness of the information provided in the reports

I, Sive Mlamla, hereby undertake that the information provided in the foregoing report is correct to the best of my knowledge and that the comments and inputs from stakeholder and Interested and Affected Parties have been correctly recorded in the report.

Signature of the EAP

Date: 14 August 2023

20.2 The inclusion of comments and inputs from stakeholders and I&APs

I, Sive Mlamla, hereby undertake that the information provided in the foregoing report is correct to the best of my knowledge and the level of agreement with stakeholder and Interested and Affected Parties have been correctly recorded and reported herein.

Signature of the EAP

Date: 14 August 2023

20.3 The inclusion of inputs and recommendations from the specialist reports where relevant; and

I, Sive Mlamla, hereby undertake that the information provided in the foregoing report is correct to the best of my knowledge and that the comments and inputs from stakeholder and Interested and Affected Parties have been correctly recorded in the report.

Signature of the EAP

Date: 14 August 2023

20.4 Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties; and

I, Sive Mlamla, hereby undertake that the information provided in the foregoing report is correct to the best of my knowledge and the level of agreement with stakeholder and Interested and Affected Parties have been correctly recorded and reported herein.

Signature of the EAP

Date: 14 August 2023

21 where applicable, details of any financial provision[s] for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts

21.1 Method to Derive the Financial Provision

The quantum of the financial provision contemplated in Regulation 54 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) will be revised and adjusted accordingly annually, based on a survey assessment of the environmental liability of Yone STEM Frontiers (Pty) Ltd. Surveys of excavations are conducted by a registered surveyor and results are forwarded to the Environmental Manager who calculates the outstanding rehabilitation as per the agreed rate in the DMRE Guideline. A bank guarantee is prepared for the amount and submitted to the DMRE.

Financial provision for the rehabilitation or management of negative environmental impacts caused by the mining operation [as required by Section 41 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] will be made in the form of a financial guarantee from a South African registered bank. This document will guarantee the financial provision relating to the Environmental Management Programme in a format as approved by the Director-General. The financial provisions presented herein are preliminary in nature. It is important to note that during the Operational Phase of the proposed development, concurrent or progressive rehabilitation is going to take place. If the applicant prospects according to the provisions of this piece of work, it is expected that only less than a hectare will remain for final rehabilitation at the end of the prospecting activities.

21.2 Confirm That the Amount Can Be Provided for From Operating Expenditure

The applicant does require external funding for purposes of conducting prospecting and mining activities.

22 An indication of any deviation from the approved scoping report, including the plan of study, including—

22.1 Any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and

There are no significant deviations from the methodology used in determining the significance of potential environmental.

22.2 A motivation for the deviation

Not applicable. If any, the applicant has encountered limitations in accessing some necessary resources.

23 Any specific information that may be required by the competent authority; and

23.1 Impact On the Socio-Economic Conditions of Any Directly Affected Person

The prospecting process is going to have a positive impact as a minimum of 19 jobs are going to be created.

23.2 Impact On Any National Estate Referred to In Section 3(2) of The National Heritage Resources Act

Where and when level of significance of impacts before mitigation is high, the Department of Mineral Resources and Energy, SAHRA and heritage specialist will be notified.

The prospecting activity may not impact on any heritage estate if effectively mitigated referred to in section 3(2) of the National Heritage Resources Act. In terms of the National Heritage Resource Act, 1999 (Act No. 25 of 1999), Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA will be contacted immediately and

work will stop. Alternatively, relevant specialist may be called in to site and in the case of fossils a representative sample may be sent for further studies or preservation.

24 Any other matters required in terms of section 24(4)(a) and (b) of the Act

There are no alternatives, as the application area applied for is the area identified with potential for a diamond, Iron, Aggregate, Gemstone and Manganese Ores prospecting operation.

PART B - ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

25 Details of EAP

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is included in PART A, Section 1.1 herein as required.

26 Description of The Aspects of The Activity

The requirement to describe the aspects of the activity that are covered by the environmental management programme is included in PART A, Section 3.2.

27 Composite Map

Refer to the figure below for a map that superimposes the proposed activity, its associated structures and infrastructures on the environmental sensitivities of the preferred site, also indicating any areas that should be avoided, including buffers. Final site layout is presented after consideration of all specialist findings and recommendations when available.

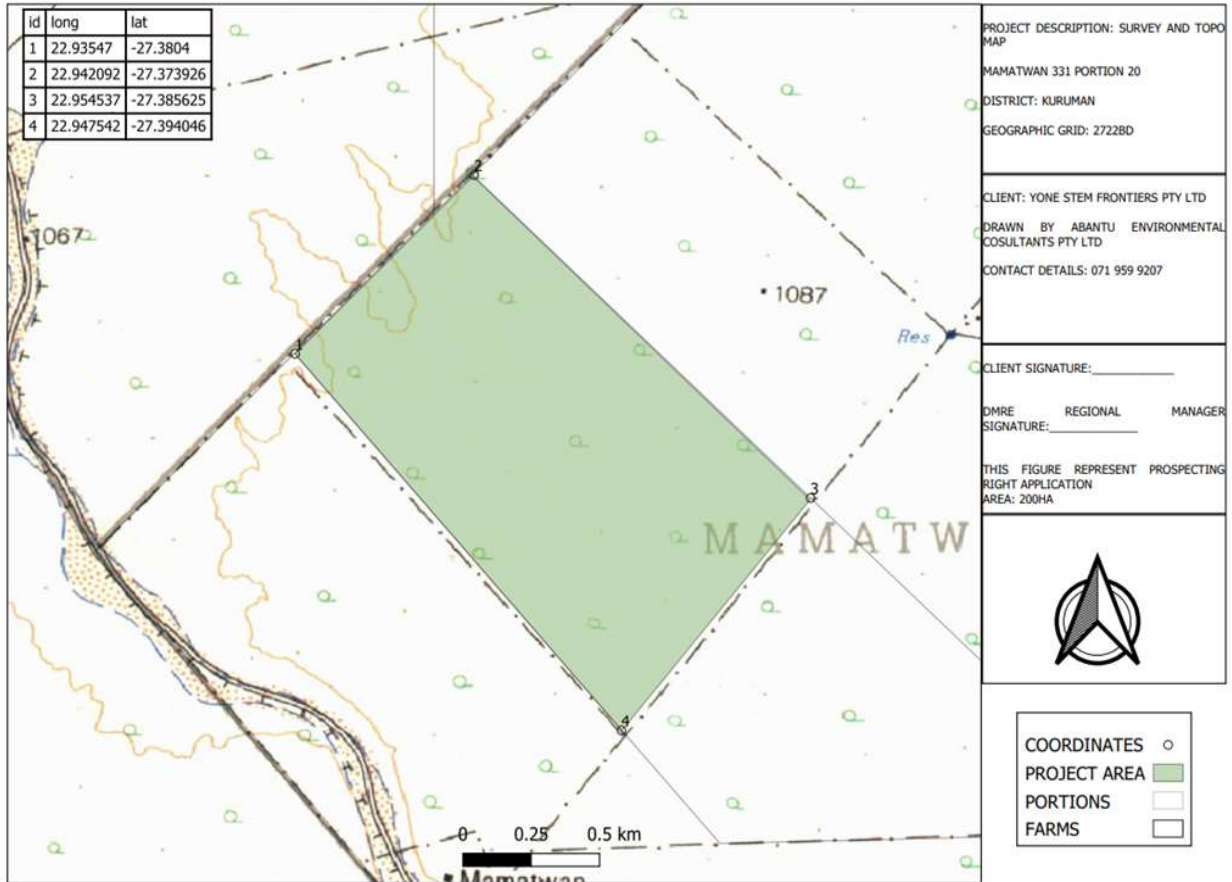


Figure 13: A composite map of the proposed prospecting activity

28 Description of The Impact Management Objectives Including Management Statement

28.1 Determination of Closure Objectives

The key aim of decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in stable, self-sustainable state. The closure objectives for the project were determined taking into account the existing type of environment as described in Section 7.4, in order to ensure that the closure objectives strive to achieve a condition approximating its natural state as far as reasonably practicable possible. Furthermore, the preliminary closure plan objectives and principles have

been developed against the background of the proposed prospecting activity location in the Kuruman region of the Northern Cape Province, and include the following:

- that environmental damage is minimised to the extent that it is acceptable to all parties involved;
- that at closure, the land will be rehabilitated to achieve an end use of wilderness and grazing;
- that all surface infrastructure will be removed from site after closure. Any open drills will be completely backfilled at operational phase and the remaining waste rock dumps shaped accordingly;
- that contamination beyond the prospecting site by wind, surface run-off or groundwater movement will be prevented;
- that closure of prospecting area is achieved efficiently, cost effectively and in compliance with the law;
- that the social and economic impacts resulting from closure of prospecting area are managed in such a way that negative socio-economic impacts are minimised.

The closure target outcomes for the site are therefore assumed to be as follows:

- to achieve chemical, physical and biological stability for an indefinite, extended time period over all disturbed landscapes and residual prospecting infrastructure;
- to protect surrounding surface water, groundwater, soils and other natural resources from loss of current utility value or environmental functioning;
- to limit the rate of emissions to the atmosphere of particulate matter and salts to the extent that degradation of the surrounding areas' land capability or environmental functioning does not occur;
- to maximise visual 'harmony' with the surrounding landscape;
- to backfill and compact the disturbed areas;
- to remove and send out for recycling HDPE lining that is utilised in the construction of Pollution Control Dams;
- to undertake landscaping;
- to re-vegetate the area where vegetation clearance occurred; and
- to create a final land use that has economic, environmental and social benefits for future generations that outweigh the long-term aftercare costs associated with the mine.

Yone STEM Frontiers (Pty) Ltd will be using a mobile camp site for its prospecting activities, and therefore no infrastructure associated with the camp site will require breaking down or demolishing at closure. The areas disturbed as a result of the prospecting operation will be rehabilitated by maintaining the general topography of the surrounding area, ensuring that there are no remnants of the structures. The closure objectives aim to return the affected area to a land use condition or desired state similar to that of the pre-mining state. Closure and rehabilitation of pits will be undertaken during the operational phase when the activities are completed in those pits, to achieve a desired land condition as early as possible. The pollution control dams (PCD) will be removed at closure and the plastic lining will be removed and recycled.

The associated environmental impact caused by the proposed development is relatively of low significance. Archaeological, Biodiversity and hydrological sensitivity are the only activity that rate relatively higher - that is medium significance. The condition or state of vegetation has degraded already. This is a factor that that could be alluded to previous vegetation clearing activities and farming that occurred in and around the area of application. Be that as it may, the potential environmental impacts associated with the proposed development are the following:

- Disturbance of some heritage resources if proposed mitigation measures are not implemented;
- Geology;
- Topography and visual alteration;
- Soils and Land Capability;
- Land Uses;
- Biodiversity;
- Noise and vibration generation or pollution;
- Air quality;
- Land capability;
- Traffic;
- Heritage inclusive of Palaeontological Resources;
- Global Warming;
- Ecology;
- Invasive alien plant species;
- Impedance on authorised lawful land uses that are in the vicinity of application area; and,

- Water sources.

An effective implementation of this environmental management plan and any other reasonable and acceptable prevention, reduction, or control and remedy of any impacts need to be ensured. This effective management of impacts will assist greatly to achieve "pain free" rehabilitation to an acceptable and self-sustainable state.

28.2 Potential Risk of Acid Mine Drainage (AMD)

AMD is not a significant factor in these Prospecting Activities.

28.3 Volumes And Rate of Water Use for Mining

The operation would require about 150 000 m³/a (estimated) over the 5-year period of prospecting operations.

28.4 Has A Water Use Licence Been Applied For?

The water use license application is in progress.

28.5 Impacts To Be Mitigated in Their Respective Phases

The EMPr addresses the following five (5) phases:

28.5.1 Planning and Construction Phase

Table 19 contains a list of potential environmental issues and the appropriate mitigation measures that may be associated with the construction phase of this proposed development. This section serves as a framework for the construction contractor even though Yone STEM Frontiers (Pty) Ltd plans to utilise mostly mobile equipment and machinery for the prospecting phase of this project within which to execute his contractual duties. This detailed EMPr may be included in the final contract(s) with the relevant construction contractors. The table only addresses those impacts that may occur on the site during the Construction and associated management measures that may require additional environmental management.

Table 19: Planning and Construction Phase

Impact management outcome: to prevent loss & sterilisation of minerals						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Undertake EIA and ensure that optimal use is made of the available mineral resource through proper planning of the prospecting operations; The prospecting should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	
Impact management outcome: to minimise topographic alterations						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Manage through limiting all project-related activities to the proposed prospecting footprint area; Utilise available information in respect of geology of application area and expand scope in relation thereto, if applicable. Pollution control dams, if any, must be lined. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to reduce erosion and sedimentation as a result of stockpiling						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All material that is excavated as a result of the proposed project's related activities must be stored appropriately on site in order to minimise impacts on watercourses, wetlands and water bodies; Stockpiles must not exceed 2 m in height; All technical and scientific information available in relation to the area of application must be shared with the Environmental Assessment Practitioner, Specialists and Engineers etc. All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to minimise soil degradation resulting in soil erosion by water						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Construct and monitor soil conservation measures at stockpiled sites as well as during construction and road-building activities; • Avoid bare, disturbed surfaces for long periods of time (e.g., re-vegetate stockpiled soils). Another option would be to backfill as quickly as reasonably practicable; • Avoid undue storm-water concentration (e.g., construct runoff measures according to soil conservation principles); • The run-off from the exposed ground should be controlled with the careful placement of flow-retarding barriers; • The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to minimise soil degradation resulting in soil erosion by wind and water						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • At no point may plant cover be removed outside of the proposed footprint area and beyond the prospecting authorised area; • The removal of plant material must be kept to a minimum; Compile and Implement the IWWMP; • Appropriate remedial action, including the rehabilitation of the eroded areas, and where necessary, the relocation of the cause of the erosion must be undertaken; • Re-establishment of indigenous plant cover on disturbed areas must take place as soon as possible once activities in that area have ceased; • Rehabilitation of the erosion channels and gullies must take place; • Avoid bare, disturbed surfaces (e.g., re-vegetate stockpiled soils). Backfill as quickly as reasonably practicable. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to mitigate negative impacts on the aquatic systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All construction areas should be suitably rehabilitated and re-vegetated as soon as possible after construction; Particles stockpiled on the tailings dam or pollution control dams, if any, contain the ore or diamondiferous gravel and kimberlitic material, which can enter the surface water via runoff or wind drift transport, if the dam are located close to the surface water; Construction vehicles must be maintained in good working order, to reduce the probability of leakage of hydrocarbons; A platform (able to prevent seepage), dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas; All Portable septic toilets must be provided and maintained for construction crews. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to mitigate negative impacts on the aquatic systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Hydrocarbon spillage or residue shall be treated with oil absorbent such as OBC, Bioremediation, GK-Spill kits or Drizzit or similar and this material removed to an approved waste site; Spill kits must be easily accessible and workers must undergo induction regarding the use thereof; Concrete must be mixed on mixing trays, plastic liners or appropriate equipment to avoid water being washed away during heavy rainfall events; After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at a registered landfill site; In the case of pollution of any surface or groundwater, the Regional Representative of the Dept. of Water & Sanitation must be informed immediately. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to mitigate negative impacts on groundwater systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Establish a groundwater monitoring programme and / or network; Water level monitoring on the site and in neighbouring boreholes to determine water level changes and aquifer storage changes with time. These impacts are not likely to be directly related to a change in recharge, however, a result of dewatering and the removal of groundwater from the aquifers; Monitoring of water quality in neighbouring boreholes should be considered for background water quality identification. The frequency of sampling would be less than for the on-site monitoring boreholes. These boreholes are categorised as off-site boreholes; Water volumes and the water balance should be compiled using actual flows, when applicable. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to mitigate negative impacts on ambient air quality						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Establish a dust fallout monitoring programme; Vegetation is to only be removed when necessary; Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression. However, in the current case, given the arid nature of the environment, it would be impractical to base topsoil removal activity schedule on soil moisture considerations); Utilise feasible methods include wet suppression (or chemical suppression to reduce water requirements), avoidance of unnecessary traffic congestion, speed control and avoidance of track-on of material onto treated roads; Use diesel with relatively low concentrations of SO₂ in TMM's and minimise impact on Global Warming; Blasting (if required) and drilling should be delayed under unfavourable windy and atmospheric conditions. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to minimise the disruption of ambient noise levels and/or increase in continuous noise levels						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure maintenance of equipment and training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events; • Placement of material stockpiles: Where possible material stockpiles should be placed so as to protect the boundaries from noise from individual operations; • Ensure equipment noise and vibration monitoring are undertaken: Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases; • Environmental noise monitoring should be carried out regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to mitigate the removal and/or disturbance to flora						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Where natural habitats must be transformed, consideration should be given to the quality of the habitat (based on the presence of microhabitats); • Minimise the footprint of transformation; • The highest quality habitat must be conserved; • Incorporate as much of the indigenous vegetation into the design layout as possible; • Cover exposed soils with brush-packs of non-invasive species in order to maximise nutrient cycling and floral re-establishment; • Access roads must be kept to a minimum, and where possible existing tracks should be used; • Footprint areas of the proposed development must be scanned for Red Listed, protected and important plant species. Recommendations of the Ecologist or Biodiversity Specialist, if any, must be adhered to. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to mitigate disturbance of fauna						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Natural corridors must be retained where possible to promote movement of fauna, especially at construction phase when a high rate of natural disruption is expected; Careful consideration is required when planning the placement for stockpiling construction material, topsoil and the creation of road network in order to avoid the destruction of pristine habitats and minimise the overall development footprint; The appointment of a full-time ECO must render guidance to the contractors with respect to suitable areas for all construction-related disturbance; Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert, if practically feasible; It is therefore recommended that all lights be fitted with sodium lights (yellow), if practicable. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to protect and preserve all cultural and heritage resources located within the study area						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • A 100-metre protection buffer must be kept around the graves during all phases of this proposed development and in the vicinity; • The mine prospecting can go ahead, mindful of the sites that have been flagged for protection. As a standard precaution archaeological deposits are usually buried underground; • Should archaeological artefacts or skeletal material be exposed in the area during prospecting operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place; • Implement Chance-Find Protocol if proposed by Palaeontologist. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to prevent pollution of environment through unmanaged waste						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All waste produced to be disposed of in permitted designated waste disposal site and reported; Waste must be stored in designated areas; Clearly demarcate and label appropriate storage for the different types of waste; Applicant to compile an Integrated Water and Waste Management Plan; Identify Waste streams on site and conduct waste classification at an appropriate time; Design storm water management plan; Waste will be collected in colour coded / clearly marked bins; Waste must be classified according to risk posed; Separation at source and other recycling-enabling strategies must be implemented; Some waste may be used to backfill excavated areas. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to minimise unnecessary negative impacts on surrounding land uses						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities; • Enter into Land Surface agreement to be signed with land owners; • Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable; • Implement a 100 m buffer between the activities in Portion 20 of Farm Mamatwan No. 331 and the activities that are undertaken at Tshipi Borwa Mine. • All activities to be restricted within the demarcated areas. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> It is recommended that a Community Liaison Forum (CLF) must be established for the surrounding communities. This committee would serve as a communication channel between the communities and the applicant. Members of the committee should include representatives from environmental groups, civil society, ward councillors, government departments (DENC, DA), District and Local Municipalities, construction teams and the applicant. Such a committee will play an important role in executing the proposed mitigation measures; The CLF should ensure that the needs of all the different groups are addressed and that decisions are clearly communicated to the community at large; Local persons should, as far as possible, be utilised in the construction and operation of the project. This will maximise local economic development and the creation of employment in the area. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Employment of local personnel will also serve to minimise the risk of negative feelings and behaviour between locals and new comers, and lessen the need for developing temporary housing for construction workers. However, it is not anticipated that the mine could be staffed from local people only, and therefore it is very likely that a construction camp would be necessary. Using local labour would ensure a smaller camp; • The local community must not be exploited. If they are employed, they should receive proper contracts in accordance to the Labour Act; • Provision must be made for public transport needs like drop off zones and bus stations. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> In addition, a transport system should be devised on the basis of the existing transport infrastructure to provide the labourers with transportation to and from home; The transport costs of the labourers should be subsidised if the applicants do decide to fully rely on the current infrastructure. However, local entrepreneurs should preferably be consulted to provide the applicants with this service; The importance of the maintenance of the roads in the area should be emphasised to the relevant authorities. The applicant must also make some contribution to maintaining the main access roads and ensure that the construction phase will do as little damage to the road surface as possible; ensure that all employees are adequately trained and qualified to perform duties. Visitors must be familiarised with the safety precautions of the operations. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to minimise extensive scarring of the landscape						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Locate construction camps and stockyards out of the visual field of highly sensitive visual receptors. Utilise the existing screening capacity of the site and provide an additional screen shade by enclosing the construction site and stockyards with dark green; Keep the construction sites and camps neat, clean and organised in order to portray a general tidy appearance; Dust suppression procedures should be implemented especially on windy days during earth works; Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the construction site free from additional unsightly elements. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to promote good Health and Safety						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Training of workers in the correct use of the machinery and/or equipment so as to avoid incidents and training of personnel on compliance to Mine Health and Safety Act; • Workers to wear Personal Protective Equipment (PPE); • Avoid bare, disturbed surfaces for long periods of time (e.g., re-vegetate stockpiled soils). Another option would be to backfill as quickly as reasonably practicable; • Control Access into the property; Fence may be erected around pits; Implement and monitor EMPr presented herein; • Hazardous material must be correctly labelled and handled in a safe manner; • Adhere to provisions of Mine Health and Safety Act. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to minimise unnecessary negative impacts on surrounding land uses						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities; • Enter into Land Surface agreement to be signed with land owners; • Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable; • All activities to be restricted within the demarcated areas; • Implement a 100 m buffer between the activities in Portion 20 of Farm Mamatwan No. 331 and the activities that are undertaken at Tshipi Borwa Mine. • Ensure that productive land which is not used during construction is made available for farming. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to prevent destruction of wetlands						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • If any prospecting activities are to take place within a river riparian zone, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998); • A storm water management plan must be implemented to ensure that dirty water is contained onsite; • A storm water management plan must be implemented to prevent run-off from the stock piles; • Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment; • The proponent must have spill procedures in place and specific awareness training; • Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to prevent traffic-related accidents and/or injury to people and livestock						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Erect and display signage in relation to speed limit on site giving regard to authorised mining activities nearby; Implement measures that ensure the adherence to traffic rules giving regard to mining activities in the vicinity; Maintain good road surface conditions; All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	
Impact management outcome: to prevent veldfires						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Construct and maintain firebreaks; Keep communication on an on-going basis with local fire-fighting persons; Establish fire-fighting systems (such as fire hydrants or suppressants). 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to eradicate and control the spread of alien invasive species						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Control the spread, of alien invasive species; Compile and implement a working weed/alien plant management programme; All landscaping must take place with indigenous species occurring in the area; All exposed areas must be covered with brush-packs of indigenous species as soon as possible following exposure in order to limit the opportunity for invader species establishment; These areas must be seeded with seeds of indigenous species collected on-site as described in the Planning phase. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to prevent destruction of wetlands						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • If any prospecting activities are to take place within a river riparian zone, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998); • A storm water management plan must be implemented to ensure that dirty water is contained onsite; • A storm water management plan must be implemented to prevent run-off from the stock piles; • Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment; • The proponent must have spill procedures in place and specific awareness training; • Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	

Impact management outcome: to minimise impacts on mining activities in the vicinity of prospecting right application area						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Erect and display signage in relation to prospecting activities whilst giving regard to authorised mining activities in the vicinity of prospecting right area; Impedance must be avoided of mining activities in the vicinity of PR area by displaying adequate signage; Control access to prospecting right application area; Maintain communication in relation to blasting schedule on adjacent property. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	
Impact management outcome: to prevent veldfires						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Construct and maintain firebreaks; Keep communication on an on-going basis with local fire-fighting persons; Establish fire-fighting systems (such as fire hydrants or suppressants) 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Table 20: Operational Phase

Impact management outcome: to optimise the exploitation of mineral resources						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Optimise prospecting activities and locate strategically infrastructure in order to access the mineral resource and recover it effectively; The prospecting should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	
Impact management outcome: to minimise topographic alterations						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Manage through best practices; The stockpiles and pollution control dams, if any, must be located on the proposed prospecting footprint area; Conduct concurrent or progressive rehabilitation. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to reduce erosion and sedimentation as a result of stockpiling						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All material that is excavated as a result of the proposed project's related activities must be stored appropriately on site in order to minimise impacts on watercourses, wetlands and water bodies; Stockpiles must not exceed 2 m in height; Avoid bare, disturbed surfaces for prolonged period of time; All technical and scientific information available in relation to the area of application must be shared with the Environmental Assessment Practitioner, Specialists and Engineers etc. All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Impact management outcome: to minimise soil degradation resulting in soil erosion by water						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Construct and monitor soil conservation measures at stockpiled sites as well as during construction and road-building activities; • Avoid bare, disturbed surfaces for long periods of time (e.g., re-vegetate stockpiled soils). Another option would be to backfill as quickly as reasonably practicable; • Avoid undue storm-water concentration (e.g., construct runoff measures according to soil conservation principles); • The run-off from the exposed ground should be controlled with the careful placement of flow-retarding barriers; • The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Impact management outcome: to minimise soil degradation resulting in soil erosion by wind and water						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> At no point may plant cover be removed outside of the proposed footprint area and beyond the prospecting authorised area; The removal of plant material must be kept to a minimum.; Appropriate remedial action, including the rehabilitation of the eroded areas, and where necessary, the relocation of the cause of the erosion must be undertaken; Re-establishment of indigenous plant cover on disturbed areas must take place as soon as possible once activities in that area have ceased; Rehabilitation of the erosion channels and gullies must take place; Avoid bare, disturbed surfaces (e.g., re-vegetate stockpiled soils). Backfill as quickly as reasonably practicable. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Impact management outcome: to mitigate negative impacts on the aquatic systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All construction areas should be suitably rehabilitated and re-vegetated as soon as possible after construction; Particles stockpiled on the tailings dam or pollution control dams, if any, contain the ore or diamondiferous gravel and kimberlitic material, which can enter the surface water via runoff or wind drift transport, if the dam are located close to the surface water; Trackless Mobile Machinery and vehicles must be maintained in good working order, to reduce the probability of leakage of hydrocarbons; A platform (able to prevent seepage), dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas; All Portable septic toilets must be provided and maintained on site. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Impact management outcome: to mitigate negative impacts on the aquatic systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Hydrocarbon spillage or residue shall be treated with oil absorbent such as OBC, Bioremediation, GK-Spill kits or Drizzit or similar and this material removed to an approved waste site; Spill kits must be easily accessible and workers must undergo induction regarding the use thereof; Implement the Integrated Waste and Water Management Plan; After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at a registered landfill site; In the case of pollution of any surface or groundwater, the Regional Representative of the Dept. of Water & Sanitation must be informed immediately. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Impact management outcome: to mitigate negative impacts on groundwater systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Establish a groundwater monitoring programme and / or network, together with the de-watering programme; Water level monitoring on the site and in neighbouring boreholes to determine water level changes and aquifer storage changes with time. These impacts are not likely to be directly related to a change in recharge, however, a result of dewatering and the removal of groundwater from the aquifers; Monitoring of water quality in neighbouring boreholes should be considered for background water quality identification. The frequency of sampling would be less than for the on-site monitoring boreholes. These boreholes are categorised as off-site boreholes; Water volumes and the water balance should be compiled using actual flows, when applicable. 	ESHRQ Department & Management Team		On-going	ESHRQ Department & Management Team	On-going	

Impact management outcome: to mitigate negative impacts on groundwater systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • All possible measures must be implemented to ensure that groundwater reserves are not polluted, including the following; • Correct storage of hydrocarbons underground and above-ground within concrete bunded areas; • High standard of maintenance on vehicles to prevent hydrocarbon leaks; • Refuelling to take place within a bunded area; • High standard of maintenance on refuelling equipment; • Ensure availability of spill kits as well as training of personnel in the use thereof; • Devise measures and implement them to ensure rapid clean-up following spill events; • Water from the dewatering process must be re-used; • Waste stream separation and classification must be undertaken including leachate tests. 	ESHRQ Department & Management Team		On-going	ESHRQ Department & Management Team	On-going	

Impact management outcome: to mitigate negative impacts on ambient air quality						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Implement a dust fallout monitoring programme; • Control options pertaining to pitting and trenching, crushing and screening, loading, hauling and transferring are generally limited to wet suppression. However, in the current case, given the arid nature of the environment, it would be impractical to base material removal activity schedule on material moisture considerations); • Utilise feasible methods include wet suppression (or chemical suppression to reduce water requirements), avoidance of speeding exceedingly and avoidance of track-on of material onto treated roads; • Use diesel with relatively low concentrations of SO₂ in TMM's and minimise impact on Global Warming and keep gas emissions below WHO concentration limits; • Dust generated from unpaved road network should be suppressed. 	ESHRQ Department & Management Team		On-going	ESHRQ Department & Management Team	On-going	

Impact management outcome: to minimise the disruption of ambient noise levels and/or increase in continuous noise levels						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure maintenance of equipment and training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events; • Placement of material stockpiles: Where possible material stockpiles should be placed so as to protect the boundaries from noise from individual operations; • Ensure equipment noise and vibration monitoring are undertaken: Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases; • Environmental noise monitoring should be carried out regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted. 	ESHRQ Department & Management Team		On-going	ESHRQ Department & Management Team	On-going	

Impact management outcome: to mitigate the removal and/or disturbance to flora						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Landscaping must be associated with indigenous species that occur naturally in the area; All landscaping must take place with indigenous species occurring in the area; All invasive species must be eradicated from the site and prevented from spreading; Incorporate as much of the indigenous vegetation into the design layout as possible; Cover exposed soils with brush-packs of non-invasive species in order to maximise nutrient cycling and floral re-establishment; Access roads must be kept to a minimum, and where possible existing tracks should be used; Exposed areas must be covered with brush-packs of indigenous species as soon as possible following exposure. 	ESHRQ Department & Management Team		On-going	ESHRQ Department & Management Team	On-going	

Impact management outcome: to mitigate disturbance of fauna						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Natural corridors must be retained where possible to promote movement of fauna, especially at construction phase when a high rate of natural disruption is expected; Careful consideration is required when planning the placement for stockpiling construction material, topsoil and the creation of road network in order to avoid the destruction of pristine habitats and minimise the overall development footprint; The appointment of a full-time ECO must render guidance to the contractors with respect to suitable areas for all construction-related disturbance; Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert, if practically feasible; It is therefore recommended that all lights be fitted with sodium lights (yellow), if practicable. 	ESHRQ Department & Management Team		On-going	ESHRQ Department & Management Team	On-going	

Impact management outcome: to protect and preserve all cultural and heritage resources located within the study area						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • A 100-metre protection buffer must be kept around the graves during all phases of this proposed development and in the vicinity; • The mine prospecting can go ahead, mindful of the sites that have been flagged for protection. As a standard precaution archaeological deposits are usually buried underground; • Should archaeological artefacts or skeletal material be exposed in the area during prospecting operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place; • Implement Chance-Find Protocol if proposed by Palaeontologist. 	ESHRQ Department & Management Team		On-going	ESHRQ Department & Management Team	On-going	

Impact management outcome: to prevent pollution of environment through unmanaged waste						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All waste produced to be disposed of in permitted designated waste disposal site and reported; Waste must be stored in designated areas; Clearly demarcate and label appropriate storage for the different types of waste; Applicant to compile an Integrated Water and Waste Management Plan; Identify Waste streams on site and conduct waste classification at an appropriate time; Design storm water management plan; Waste will be collected in colour coded / clearly marked bins; Waste must be classified according to risk posed; Separation at source and other recycling-enabling strategies must be implemented; Some waste may be used to backfill excavated areas. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Impact management outcome: to minimise unnecessary negative impacts on surrounding land uses						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities; • Enter into Land Surface agreement to be signed with land owners; • Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable; • Implement a 100 m buffer between the activities in Portion 20 of Farm Mamatwan No. 331 and the activities that are undertaken at Tshipi Borwa Mine; • All activities to be restricted within the demarcated areas. 	ERSHQ Department and / or Management Team		On-going	ERSHQ Department and / or Management Team	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> It is recommended that a Community Liaison Forum (CLF) must be established for the surrounding communities. This committee would serve as a communication channel between the communities and the applicant. Members of the committee should include representatives from environmental groups, civil society, ward councillors, government departments (DENC, DA), District and Local Municipalities, construction teams and the applicant. Such a committee will play an important role in executing the proposed mitigation measures; The CLF should ensure that the needs of all the different groups are addressed and that decisions are clearly communicated to the community at large; Local persons should, as far as possible, be utilised in the construction and operation of the project. This will maximise local economic development and the creation of employment in the area. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Employment of local personnel will also serve to minimise the risk of negative feelings and behaviour between locals and new comers, and lessen the need for developing temporary housing for construction workers. However, it is not anticipated that the mine could be staffed from local people only, and therefore it is very likely that a construction camp would be necessary. Using local labour would ensure a smaller camp; • The local community must not be exploited. If they are employed, they should receive proper contracts in accordance to the Labour Act; • Provision must be made for public transport needs like drop off zones and bus stations. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> In addition, a transport system should be devised on the basis of the existing transport infrastructure to provide the labourers with transportation to and from home; The transport costs of the labourers should be subsidised if the applicants do decide to fully rely on the current infrastructure. However, local entrepreneurs should preferably be consulted to provide the applicants with this service; The importance of the maintenance of the roads in the area should be emphasised to the relevant authorities. The applicant must also make some contribution to maintaining the main access roads and ensure that the construction phase will do as little damage to the road surface as possible; ensure that all employees are adequately trained and qualified to perform duties. Visitors must be familiarised with the safety precautions of the operations. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to minimise extensive scarring of the landscape						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Locate construction camps and stockyards out of the visual field of highly sensitive visual receptors. Utilise the existing screening capacity of the site and provide an additional screen shade by enclosing the construction site and stockyards with dark green; • Keep the construction sites and camps neat, clean and organised in order to portray a general tidy appearance; • Dust suppression procedures should be implemented especially on windy days during earth works; • Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the construction site free from additional unsightly elements. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to promote good Health and Safety						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Training of workers in the correct use of the machinery and/or equipment so as to avoid incidents and training of personnel on compliance to Mine Health and Safety Act; • Workers to wear Personal Protective Equipment (PPE); • Avoid bare, disturbed surfaces for long periods of time (e.g., re-vegetate stockpiled soils). Another option would be to backfill as quickly as reasonably practicable; • Control Access into the property; Fence may be erected around pits; Implement and monitor EMPr presented herein; • Hazardous material must be correctly labelled and handled in a safe manner; • Adhere to provisions of Mine Health and Safety Act. 	ECO/Contractor		On-going	ECO/Contractor	On-going	

Impact management outcome: to minimise unnecessary negative impacts on surrounding land uses						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities; • Enter into Land Surface agreement to be signed with land owners; • Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable; • All activities to be restricted within the demarcated areas; • Implement a 100 m buffer between the activities in Portion 20 of Farm Mamatwan No. 331 and the activities that are undertaken at Tshipi Borwa Mine; • Ensure that productive land which is not used during construction is made available for farming. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent destruction of wetlands						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • If any prospecting activities are to take place within a river riparian zone, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998); • A storm water management plan must be implemented to ensure that dirty water is contained onsite; • A storm water management plan must be implemented to prevent run-off from the stock piles; • Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment; • The proponent must have spill procedures in place and specific awareness training; • Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent traffic-related accidents and/or injury to people and livestock						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Erect and display signage in relation to speed limit on site giving regard to authorised mining activities nearby; Implement measures that ensure the adherence to traffic rules giving regard to mining activities in the vicinity; Maintain good road surface conditions; All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	
Impact management outcome: to prevent veldfires						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Construct and maintain firebreaks; Keep communication on an on-going basis with local fire-fighting persons; Establish fire-fighting systems (such as fire hydrants or suppressants). 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Impact management outcome: to eradicate and control the spread of alien invasive species						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Control the spread, of alien invasive species; Compile and implement a working weed/alien plant management programme; All landscaping must take place with indigenous species occurring in the area; All exposed areas must be covered with brush-packs of indigenous species as soon as possible following exposure in order to limit the opportunity for invader species establishment; These areas must be seeded with seeds of indigenous species collected on-site as described in the Planning phase. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent destruction of wetlands						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • If any prospecting activities are to take place within a river riparian zone, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998); • A storm water management plan must be implemented to ensure that dirty water is contained onsite; • A storm water management plan must be implemented to prevent run-off from the stock piles; • Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment; • The proponent must have spill procedures in place and specific awareness training; • Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent traffic-related accidents and/or injury to people and livestock						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Erect and display signage in relation to speed limit on site giving regard to authorised mining activities nearby; Implement measures that ensure the adherence to traffic rules giving regard to mining activities in the vicinity; Maintain good road surface conditions; All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	
Impact management outcome: to prevent veldfires						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Construct and maintain firebreaks; Keep communication on an on-going basis with local fire-fighting persons; Establish fire-fighting systems (such as fire hydrants or suppressants) 	ESHRQ Department & Management Team		Continuous	ESHRQ Department & Management Team	On-going	

Table 21: Decommissioning and Post-closure

Impact management outcome: to prevent loss & sterilisation of minerals						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Backfilling and rehabilitation must be undertaken in order to establish other possible land uses post-closure and resource recovery may be easy; The prospecting should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources. 	ESHRQ Department & Management (Applicant)		Continuous	ESHRQ Department & Management (Applicant)	On-going	
Impact management outcome: to minimise topographic alterations						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Manage through limiting all project-related activities to the proposed prospecting footprint area; Utilise available information in respect of geology of application area and expand scope in relation thereto, if applicable. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to reduce erosion and sedimentation as a result of stockpiling						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All material that is excavated as a result of the proposed project's related activities must be stored appropriately on site in order to minimise impacts on watercourses, wetlands and water bodies; Stockpiles must not exceed 2 m in height; All technical and scientific information available in relation to the area of application must be shared with the Environmental Assessment Practitioner, Specialists and Engineers etc. All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to minimise soil degradation resulting in soil erosion by water						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Construct and monitor soil conservation measures at stockpiled sites as well as during construction and road-building activities; • Avoid bare, disturbed surfaces for long periods of time (e.g., re-vegetate stockpiled soils). Another option would be to backfill as quickly as reasonably practicable; • Avoid undue storm-water concentration (e.g., construct runoff measures according to soil conservation principles); • The run-off from the exposed ground should be controlled with the careful placement of flow-retarding barriers; • The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to minimise soil degradation resulting in soil erosion by wind and water						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> At no point may plant cover be removed outside of the proposed footprint area and beyond the prospecting authorised area; The removal of plant material must be kept to a minimum.; Appropriate remedial action, including the rehabilitation of the eroded areas, and where necessary, the relocation of the cause of the erosion must be undertaken; Re-establishment of indigenous plant cover on disturbed areas must take place as soon as possible once activities in that area have ceased; Rehabilitation of the erosion channels and gullies must take place; Avoid bare, disturbed surfaces (e.g., re-vegetate stockpiled soils). Backfill as quickly as reasonably practicable. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to mitigate negative impacts on the aquatic systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All construction areas should be suitably rehabilitated and re-vegetated as soon as possible after construction; Particles stockpiled on the tailings dam or pollution control dams, if any, contain the ore or diamondiferous gravel and kimberlitic material, which can enter the surface water via runoff or wind drift transport, if the dam are located close to the surface water; Construction vehicles must be maintained in good working order, to reduce the probability of leakage of hydrocarbons; A platform (able to prevent seepage), dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas; All Portable septic toilets must be provided and maintained for construction crews. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to mitigate negative impacts on the aquatic systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Hydrocarbon spillage or residue shall be treated with oil absorbent such as OBC, Bioremediation, GK-Spill kits or Drizzit or similar and this material removed to an approved waste site; Spill kits must be easily accessible and workers must undergo induction regarding the use thereof; Concrete must be mixed on mixing trays, plastic liners or appropriate equipment to avoid water being washed away during heavy rainfall events; After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at a registered landfill site; In the case of pollution of any surface or groundwater, the Regional Representative of the Dept. of Water & Sanitation must be informed immediately. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to mitigate negative impacts on groundwater systems						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Establish a groundwater monitoring programme and / or network; Water level monitoring on the site and in neighbouring boreholes to determine water level changes and aquifer storage changes with time. These impacts are not likely to be directly related to a change in recharge, however, a result of dewatering and the removal of groundwater from the aquifers; Monitoring of water quality in neighbouring boreholes should be considered for background water quality identification. The frequency of sampling would be less than for the on-site monitoring boreholes. These boreholes are categorised as off-site boreholes; Water volumes and the water balance should be compiled using actual flows, when applicable. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to mitigate negative impacts on ambient air quality						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Establish a dust fallout monitoring programme; Vegetation is to only be removed when necessary; Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression. However, in the current case, given the arid nature of the environment, it would be impractical to base topsoil removal activity schedule on soil moisture considerations); Utilise feasible methods include wet suppression (or chemical suppression to reduce water requirements), avoidance of unnecessary traffic congestion, speed control and avoidance of track-on of material onto treated roads; Use diesel with relatively low concentrations of SO₂ in TMM's and minimise impact on Global Warming; Blasting (if required) and drilling should be delayed under unfavourable windy and atmospheric conditions. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to minimise the disruption of ambient noise levels and/or increase in continuous noise levels						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure maintenance of equipment and training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events; • Placement of material stockpiles: Where possible material stockpiles should be placed so as to protect the boundaries from noise from individual operations; • Ensure equipment noise and vibration monitoring are undertaken: Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases; • Environmental noise monitoring should be carried out regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to mitigate the removal and/or disturbance to flora						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Where natural habitats must be transformed, consideration should be given to the quality of the habitat (based on the presence of microhabitats); • Minimise the footprint of transformation; • The highest quality habitat must be conserved; • Incorporate as much of the indigenous vegetation into the design layout as possible; • Cover exposed soils with brush-packs of non-invasive species in order to maximise nutrient cycling and floral re-establishment; • Access roads must be rehabilitated, and where possible existing tracks should be used; • Footprint areas of the proposed development must be scanned for Red Listed, protected and important plant species. Recommendations of the Ecologist or Biodiversity Specialist, if any, must be adhered to. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to mitigate disturbance of fauna						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Natural corridors must be retained where possible to promote movement of fauna, especially at construction phase when a high rate of natural disruption is expected; Careful consideration is required when planning the placement for stockpiling construction material, topsoil and the creation of road network in order to avoid the destruction of pristine habitats and minimise the overall development footprint; The appointment of a full-time ECO must render guidance to the contractors with respect to suitable areas for all construction-related disturbance; Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert, if practically feasible; It is therefore recommended that all lights be fitted with sodium lights (yellow), if practicable. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to protect and preserve all cultural and heritage resources located within the study area						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • A 100-metre protection buffer must be kept around the graves during all phases of this proposed development and in the vicinity; • The mine prospecting can go ahead, mindful of the sites that have been flagged for protection. As a standard precaution archaeological deposits are usually buried underground; • Should archaeological artefacts or skeletal material be exposed in the area during prospecting operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place; • Implement Chance-Find Protocol if proposed by Palaeontologist. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent pollution of environment through unmanaged waste						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> All waste produced to be disposed of in permitted designated waste disposal site and reported; Waste must be stored in designated areas; Clearly demarcate and label appropriate storage for the different types of waste; Applicant to monitor the implementation of an Integrated Water and Waste Management Plan; Identify Waste streams on site and conduct waste classification at an appropriate time; Maintain storm water management plan; Waste will be collected in colour coded / clearly marked bins; Waste must be classified according to risk posed; Separation at source and other recycling-enabling strategies must be implemented; Some waste may be used to backfill excavated areas. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to minimise unnecessary negative impacts on surrounding land uses						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities; • Enter into Land Surface agreement to be signed with land owners; • Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable; • Obtain closure certificate from the Competent Authority, if applicable; • Implement a 100 m buffer between the activities in Portion 20 of Farm Mamatwan No. 331 and the activities that are undertaken at Tshipi Borwa Mine; • All activities to be restricted within the demarcated areas. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> It is recommended that a Community Liaison Forum (CLF) must be established for the surrounding communities. This committee would serve as a communication channel between the communities and the applicant. Members of the committee should include representatives from environmental groups, civil society, ward councillors, government departments (DENC, DA), District and Local Municipalities, construction teams and the applicant. Such a committee will play an important role in executing the proposed mitigation measures; The CLF should ensure that the needs of all the different groups are addressed and that decisions are clearly communicated to the community at large; Local persons should, as far as possible, be utilised in the construction and operation of the project. This will maximise local economic development and the creation of employment in the area. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Employment of local personnel will also serve to minimise the risk of negative feelings and behaviour between locals and new comers, and lessen the need for developing temporary housing for construction workers. However, it is not anticipated that the mine could be staffed from local people only, and therefore it is very likely that a construction camp would be necessary. Using local labour would ensure a smaller camp; • The local community must not be exploited. If they are employed, they should receive proper contracts in accordance to the Labour Act; • Provision must be made for public transport needs like drop off zones and bus stations. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to avoid detrimental impacts on the communities						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> In addition, a transport system should be devised on the basis of the existing transport infrastructure to provide the labourers with transportation to and from home; The transport costs of the labourers should be subsidised if the applicants do decide to fully rely on the current infrastructure. However, local entrepreneurs should preferably be consulted to provide the applicants with this service; The importance of the maintenance of the roads in the area should be emphasised to the relevant authorities. The applicant must also make some contribution to maintaining the main access roads and ensure that the construction phase will do as little damage to the road surface as possible; ensure that all employees are adequately trained and qualified to perform duties. Visitors must be familiarised with the safety precautions of the operations. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to minimise extensive scarring of the landscape						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Locate construction camps and stockyards out of the visual field of highly sensitive visual receptors. Utilise the existing screening capacity of the site and provide an additional screen shade by enclosing the construction site and stockyards with dark green; Keep rehabilitation sites and camps neat, clean and organised in order to portray a general tidy appearance; Dust suppression procedures should be implemented especially on windy days during earth works; Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the construction site free from additional unsightly elements. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to promote good Health and Safety						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Training of workers in the correct use of the machinery and/or equipment so as to avoid incidents and training of personnel on compliance to Mine Health and Safety Act; • Workers to wear Personal Protective Equipment (PPE); • Avoid bare, disturbed surfaces for long periods of time (e.g., re-vegetate stockpiled soils). Another option would be to backfill as quickly as reasonably practicable; • Control Access into the property; Fence may be erected around pits; Implement and monitor EMPr presented herein; • Hazardous material must be correctly labelled and handled in a safe manner; • Adhere to provisions of Mine Health and Safety Act. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to minimise unnecessary negative impacts on surrounding land uses						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities; • Enter into Land Surface agreement to be signed with land owners; • Employ effective rehabilitation strategies to restore land capability and land use potential of the farm, where reasonably practicable; • All activities to be restricted within the demarcated areas; • Implement a 100 m buffer between the activities in Portion 20 of Farm Mamatwan No. 331 and the activities that are undertaken at Tshipi Borwa Mine; • Ensure that productive land which is monitored post-closure is made available for farming. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent destruction of wetlands						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • If any prospecting activities are to take place within a river riparian zone, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998); • A storm water management plan must be maintained to ensure that dirty water is contained onsite; • A storm water management plan must be monitored to prevent run-off and soil erosion; • Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment; • The proponent must have spill procedures in place and specific awareness training; • Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent traffic-related accidents and/or injury to people and livestock						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Erect and display signage in relation to speed limit on site giving regard to authorised mining activities nearby; Implement measures that ensure the adherence to traffic rules giving regard to mining activities in the vicinity; Rehabilitate road surfaces; All stockpiled material must be used for backfilling and kept clear of weeds and alien vegetation growth by undertaking regular weeding methods. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	
Impact management outcome: to prevent veldfires						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Construct and maintain firebreaks; Keep communication on an on-going basis with local fire-fighting persons; Establish fire-fighting systems (such as fire hydrants or suppressants). 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to eradicate and control the spread of alien invasive species						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Control the spread, of alien invasive species; implement a working weed/alien plant management programme; All landscaping must take place with indigenous species occurring in the area; All exposed areas must be covered with brush-packs of indigenous species as soon as possible following exposure in order to limit the opportunity for invader species establishment; These areas must be seeded with seeds of indigenous species collected on-site as described in the Planning phase. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent destruction of wetlands						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • If any prospecting activities are to take place within a river riparian zone, the associated buffer zone or disturb the network of dry seasonal streams, a Water Use License Application (WULA) must be submitted to the Department of Water Affairs (DWA) as per Section 21 of the National Water Act (Act 36 of 1998); • A storm water management plan must be maintained to ensure that dirty water is contained onsite; • A storm water management plan must be monitored post-closure to prevent run-off and soil erosion; • Hazardous chemical materials should be stored in bunded areas to prevent leakage into the environment; • The proponent must have spill procedures in place and specific awareness training; • Waste should be regularly removed from the site by suitably equipped and qualified operators and disposed of in approved facilities. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

Impact management outcome: to prevent traffic-related accidents and/or injury to people and livestock						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Dismantle signage in relation to speed limit on site giving regard to authorised mining activities nearby; • Implement measures that ensure the adherence to traffic rules giving regard to mining activities in the vicinity; • Rehabilitate road surfaces; • All stockpiled material must be used for backfilling and kept clear of weeds and alien vegetation growth by undertaking regular weeding methods. 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	
Impact management outcome: to prevent veldfires						
Impact management actions	Implementation			Monitoring		
	Responsible Person	Method	Timeframe	Responsible Person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> • Rehabilitate constructed and maintained firebreaks; • Keep communication on an on-going basis with local fire-fighting persons; • Dismantle and rehabilitate fire-fighting systems (such as fire hydrants or suppressants). 	ESHRQ Department & Mine Management		Continuous	ESHRQ Department & Mine Management	On-going	

29 A description and identification of Impact Management Outcomes required for the aspects

The impact management outcomes are presented in Table 22.

Table 22: Impact Management Outcomes

Aspect	Activity	Potential Impact	Phase/s	Significance (Pre-mitigation)	Management actions type	Significance (Post-mitigation)	Impact management objectives
Geology	Mineralised waste Use of facilities and services prospecting final land forms	Loss and sterilisation of mineral resources	Planning Operational Decommissioning	Low	<ul style="list-style-type: none"> Management through best practises 	Low	Can be managed/mitigated to acceptable levels
Topography	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Deep excavations and infrastructure resulting in safety risks to third parties and animals	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> Control through access control; control through management and monitoring; control through rehabilitation; and remedy through emergency response procedures Progressive rehabilitation 	Low - Medium	Can be managed/mitigated to acceptable levels
Soil and land capability	Earthworks; Mineralised waste; Water use and management; Support services; Transportation	Loss of soil resources and land capability through	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> Control through waste management practices; 	Low - Medium	Can be managed/mitigated to acceptable levels

	system; Use of facilities and services; Pitting and Trenching; Final land forms	contamination			<ul style="list-style-type: none"> control through rehabilitation; control through appropriate design; and remedy through emergency response procedures 		
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of soil resource and land capability through physical disturbance	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> Manage through limiting the project footprint; manage through soil conservation procedures; and manage through closure planning and rehabilitation 	Low - Medium	Can be managed/mitigated to acceptable levels
Biodiversity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Physical destruction of biodiversity	Planning Construction Operational Decommissioning	Medium - High	<ul style="list-style-type: none"> Management through biodiversity action plan and offset (when relevant); managing through limiting the project footprint; management through rehabilitation; and control through permits for removal 	Low	Can be managed/mitigated to acceptable levels

	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	General disturbance of biodiversity	Planning Construction Operational Decommissioning	Medium - High	<ul style="list-style-type: none"> • Management through alien invasive species programme; • management through training; • management through monitoring; • management through appropriate design; and • remedy through emergency response procedures 	Low	Can be managed/mitigated to acceptable levels
Surface water	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Alteration of natural drainage patterns	Planning Construction Operational Decommissioning	Medium - High	<ul style="list-style-type: none"> • Management through storm water control; and • manage through monitoring water requirements 	Low - Medium	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Contamination of surface water resources	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • Management through waste management practises; • management through monitoring; • management through compensation; and • remedy through emergency response procedures 	Low	Can be managed/mitigated to acceptable levels

Groundwater	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Contamination of groundwater resources	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • management through monitoring; • management through compensation; • management through appropriate design; and • remedy through emergency response procedures 	Low	Can be managed/mitigated to acceptable levels
	Deep excavation and pits	Lowering of groundwater levels and reducing availability	Operational	Medium - High	<ul style="list-style-type: none"> • Management through monitoring; and • management through compensation 	Medium - High	Can be managed/mitigated to acceptable levels
Air quality	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Air pollution and Global Warming (Climate Change)	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • Manage through air controls and monitoring; • Monitor air quality, inclusive of asbestos fibre analysis. 	Low - Medium	Can be managed/mitigated to acceptable levels
Noise & Vibration	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Increase in disturbing vibration and noise levels	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • Manage through vibration and noise controls and once-off sampling 	Low	Can be managed/mitigated to acceptable levels

Visual amenity	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Negative visual Views	Planning Construction Operational Decommissioning	Low	<ul style="list-style-type: none"> • Manage through limiting project footprint, rehabilitation and visual controls 	Low	Can be managed/mitigated to acceptable levels
Heritage/cultural and palaeontological	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Loss of heritage/cultural and palaeontological resources	Planning Construction Operational Decommissioning	Medium – High (Heritage) Low – Medium (Palaeontology)	<ul style="list-style-type: none"> • Control through avoidance; and • remedy through emergency response procedures • Follow Chance-Find Protocol 	Low Low	Can be avoided Can be managed through implementation of Chance-Find Protocol
Socio-economic	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Influx of labour	Construction Operational	Low - Medium	<ul style="list-style-type: none"> • Control through the monitoring of living conditions of employees, recruitment processes, disease management; and • remedy through emergency response procedures 	Low	Can be managed/mitigated to acceptable levels
	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and	Socio-economic impact	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • Control through good communication, recruitment and procurement processes 	Low - Medium	Can be managed/mitigated to acceptable levels

	services; Pitting and Closure associated activities that are in line with closure plan						
Veld fires	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Destruction of current land uses and habitat fragmentation patterns	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> Establish Fire Breaks of no less than six (6) metres in width; Construct and maintain functioning fire hydrants 	Low - Medium	Can be managed/mitigated to acceptable levels
Health and Safety	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Health and Safety impact	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> Implement provisions of the Mine Health and Safety Act; Devise and implement rural safety measures. 	Low	Can be managed/mitigated to acceptable levels
Land use	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Closure associated activities that are in line with closure plan	Interference with land uses	Planning Construction Operational Decommissioning	Medium - High	Management through Communication	Low	Can be managed/mitigated to acceptable levels

Traffic	Use of existing infrastructure with minimal construction of haul roads and use of existing facilities and services	Road disturbance and traffic safety	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • Manage through road maintenance; • Adherence to speed limit; and • remedy through emergency response procedures 	Low - Medium	Can be managed/mitigated to acceptable levels
Wetlands	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Disturbance of Riparian zone	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • Manage through the principle of avoidance of disturbance of the anything within the Riparian zone; and • Implement recommendations of the wetland specialist, if any. 	Low	Can be managed/mitigated to acceptable levels
Waste	Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms	Pollution	Planning Construction Operational Decommissioning	Low - Medium	<ul style="list-style-type: none"> • Manage through the principle of waste separation at source; • Implement the waste National Waste Management Strategy and Waste Hierarchy 	Low	Can be managed/mitigated to acceptable levels

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Alien invasive plants</p>	<p>Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms</p>	<p>Colonisation by alien invasive plants</p>	<p>Planning Construction Operational Decommissioning</p>	<p>Medium - High</p>	<ul style="list-style-type: none"> • Compile weed/alien plant management programme in consultation with DENC and DA. • Implement the compiled weed/alien management programme effectively. 	<p>Low</p>	<p>Can be managed/mitigated to acceptable levels</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Agricultural-Economic Impact</p>	<p>Site Establishment; Earthworks; Mineralised waste; Water use and management; Support services; Transportation system; Use of facilities and services; Pitting and Trenching; Final land forms</p>	<p>Agricultural-Economic Impact</p>	<p>Planning Construction Operational Decommissioning</p>	<p>Low - Medium</p>	<ul style="list-style-type: none"> • Maintain communication with Interested & Affected Parties; • Limit footprint within area of application; • Compensate affected party, if necessary and applicable. 	<p>Low - Medium</p>	<p>Can be managed/mitigated to acceptable levels</p>

30 Financial Provision

30.1 Determination of The Amount of The Financial Provision

As stated in the draft report that was submitted to the Competent Authority pertaining to the proposed development, concurrent or progressive rehabilitation is going to be undertaken during the prospecting phase. If the applicant or technical partner implements the plan as recommended in this piece of work, only less than one hectare will remain at final rehabilitation and closure of the project.

30.1.1 Description of The Closure Objectives and The Alignment with The Baseline Environment

The preliminary closure plan objectives and principles have been developed against the background of the mine location in the Kuruman region of the Northern Cape Province, and include the following:

- that environmental damage is minimised to the extent that it is acceptable to all parties involved;
- that at closure, the land will be rehabilitated to achieve an end use of wilderness and grazing;
- that all surface infrastructure will be removed from site after closure. The open pit will be completely backfilled and the remaining waste rock dumps shaped accordingly;
- that contamination beyond the mine site by wind, surface run-off or groundwater movement will be prevented;
- that closure prospecting operations is achieved efficiently, cost effectively and in compliance with the law; and,
- that the social and economic impacts resulting from closure of operations are managed in such a way that negative socio-economic impacts are minimised.

The closure target outcomes for the site are therefore assumed to be as follows:

- to achieve chemical, physical and biological stability for an indefinite, extended time period over all disturbed landscapes and residual mining infrastructure;
- to protect surrounding surface water, groundwater, soils and other natural resources from loss of current utility value or environmental functioning;
- to limit the rate of emissions to the atmosphere of particulate matter and salts to the extent that degradation of the surrounding areas' land capability or environmental functioning does not occur;
- to maximise visual 'harmony' with the surrounding landscape; and
- to create a final land use that has economic, environmental and social benefits for future generations that outweigh the long-term aftercare costs associated with the mine.

30.1.2 Confirmation That the Closure Objectives Have Been Consulted with Landowners and I&APs

The consultation process with interested and affected parties (neighbouring farmers and land owners) will be completed. Regular contact sessions will be held with neighbouring farmers and land owners which are currently affected by the prospecting operations. Records will be kept of the complaints and the mitigation measures will be implemented. An advert in the Kathu Gazette will also be placed in order for other interested parties to come forward and register as interested parties in the project.

30.1.3 Rehabilitation Plan

Infrastructure Areas

On completion of the prospecting operations, the various surfaces, including the access road, the office area, storage areas and the screening plant site should finally be rehabilitated as follows:

- All remaining material on the surface should be removed to the original topsoil level. This material should then be backfilled into the depressions. Any compacted area should be ripped to a depth of 300 mm, where possible, the topsoil or growth medium returned and landscaped;
- All infrastructures, equipment, screening plant, and other items used during the operational period should be removed from site; and
- On completion of operations, all buildings, structures or objects on the office site should be dealt with in accordance with Regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the prospecting area and disposed of at a recognized landfill facility. It should be permitted to be buried or burned on the site.

On-going Seepage, Control of Rain Water: It is not foreseen that any monitoring of ground or surface water should take place after mine closure, except if so, requested by the DHWS – Northern Cape.

Long-Term Stability and Safety: It should be the objective of mine management to ensure the long-term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of mine closure.

Final Rehabilitation Roads

After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and seeded, providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources and Energy.

Submission of Information

Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources and Energy – Northern Cape, as described in Regulation 55.

Maintenance (Aftercare)

Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme. The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.

The aim with the closure of the mine should be to create an acceptable post-mine environment and land-use. Therefore, all agreed commitments should be implemented by Mine Management.

After-effects Following Closure

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long Term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent cleaning of all tailings material and replacement of topsoil where available should be ensured.

The percentage share due to the landowner, Yone STEM Frontiers (Pty) Ltd must be inclusive of amount of compensation as determined in the offset strategy. This must be in a form of a binding agreement or may be annexed to an already existing binding agreement as an addition to the percentage share agreed upon. The steps to be followed in final rehabilitation are presented in Table 23 as preliminary step that may be reviewed.

Table 23: Final Rehabilitation

Step	Final Rehabilitation	Target	Responsible Person	Timeframe
1	Pre-closure activities			
1,1	The closure plan presented herein should be reviewed throughout the life of operation.	In order ensure compliance and / or meet provisions of Land surface use agreement.	ECO/ESHRQ Department/Rehabilitation Specialist	Annually
1,2	Consult with the Competent Authority before commencement of final rehabilitation.	In order ensure compliance and / or meet provisions of Land surface use agreement.	ECO/ESHRQ Department/Rehabilitation Specialist	Before final rehabilitation commences
1,3	Apply for necessary permits and licenses before disturbing protected plant and animal species.	In rescue protected species and to ensure compliance.	ECO/ESHRQ Department/Rehabilitation Specialist	Before disturbance of Protected Species
1,4	Utilise available resources, environmentally friendly waste and material during rehabilitation.	In order to ensure implementation of RRR's in waste management.	Project Manager/ECO	On-going
1,5	Separated and classified waste, if applicable, must be disposed of in accordance with applicable piece of legislation and regulations.	In order to ensure implementation of RRR's in waste management.	Project Manager/ECO/ ESHRQ Department	On-going
1,6	Call in a suitably qualified Archaeologist or Palaeontologist to attend and Notify SAHRA if any heritage and palaeontological resources are encountered during rehabilitation.	In order to preserve and rescue resources of heritage, cultural and palaeontological significance.	Project Manager/ECO/ ESHRQ Department	On-going
2	Surface infrastructure			
2,1	Create a database and collect data through taking of clear photographs of activity and of associated and / or related infrastructure (before, during and after rehabilitation).	In order to ensure compliance end adherence to land surface use agreement provisions	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	Before commencement of operations and on an on-going basis.
2,2	Remove mobile infrastructure from site.	In order to restore the state of land.		After prospecting activities have been completed
2,3	Demolish, dismantle and /or remove all other infrastructure from site, if applicable.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	After prospecting activities have been completed
2,4	Rehabilitate disturbed areas.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
2,5	Caution must be exercised in removing infrastructure for purposes of enabling re-usability and resale.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
2,6	Pollution control dams and associated infrastructure will be rehabilitated after all water grey has been used during rehabilitation.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	After prospecting activities have been completed
2,7	Soil that was beneath hydrocarbon storage facilities and TMM parking area must be screened and / or analysed for presence of hydrocarbons by an experienced and suitably qualified consultant.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	After prospecting activities have been completed
3	Soil and Land			
3,1	Landscaping should be conducted.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going

3,2	Soil erosion should be taken into account when landscaping is conducted.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
3,3	Restore topography to acceptable levels.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
3,4	If progressive rehabilitation was conducted during operational phase, the topsoil may be compacted and prepared for re-vegetation.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
3,5	Disturbed areas that were covered by concrete previously must be prepared for re-vegetation.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
4	Re-vegetation (before and during)			
4,1	Measure should be put in place to ensure that topsoil is suitable for re-vegetation purposes.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	Before re-vegetation commences
4,2	Control access into the rehabilitated areas.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
4,3	The rehabilitated areas must be protected and monitored for three (3) years post-closure.	In order to restore the state of land.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	Post decommissioning and closure
5	Maintenance and monitoring			
5,1	Keep the Competent Authority updated of progress and of any developments.	In order to ensure compliance.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
5,2	Maintenance of rehabilitated areas should be performed on an on-going basis.	In order to ensure compliance.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going
5,3	Monitoring of rehabilitated areas must be performed for three (3) years post-closure.	In order to ensure compliance.	Project Manager/ECO/ ESHRQ Department/Rehabilitation Specialist	On-going

30.1.4 Explain why it can be confirmed that the rehabilitation plan is compatibility with the closure objectives

The ultimate rehabilitation of the prospecting site that involves the sloping, levelling, replacement of topsoil and the seeding of a grass seed mix in areas that does not recover acceptably as agreed to by the land owner will ensure that the site could be regarded as safe for humans and animals and will also ensure that the site is stable from an erosion point of view and also ensuring that the site could be used for grazing again.

The removal of waste material of any description from the prospecting area and the disposal thereof at a recognised landfill facility is going to be facilitated.

- The removal of infrastructure, equipment, plant and other items from the site;
- The ripping of compacted areas to a level of 300 mm and the levelling of such areas in order to re-establish a growth medium for plants (such areas will furthermore be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the prospecting operation, if the re-establishment of vegetation is unacceptably slow.

The backfilling of the final excavations with subsoil and the covering thereof with previously stored topsoil (where-after this area will also be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the proposed operation, and seedlings protected for a period of one) if the re-establishment of vegetation is unacceptably slow.

30.1.5 Calculate and State the Quantum of The Financial Provision

The financial provisions presented herein are preliminary in nature.

Yone STEM Frontiers (Pty) Ltd

The Proposed Prospecting Right and associated Equipment, Machinery, Processes and Infrastructure and related Activities Project: Environmental Impact Assessment Report, near Kuruman, Northern Cape

CALCULATION OF THE QUANTUM							
Applicant:		Yone STEM Frontiers (Pty) Ltd			Ref No.: 13444PR		
					Date: 14 August 20:		
No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	100	15,94	1	1	1594
2 (A)	Demolition of steel buildings and structures	m2	0	221,99	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	327,14	1	1	0
3	Rehabilitation of access roads	m2	100	39,72	1	1	3972
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	385,55	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	210,3	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	443,97	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	1	225 957,57	1	1	225957,57
7	Sealing of shafts adits and inclines	m3	0	119,17	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,08	155 155,97	1	1	12412,4776
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	193 243,96	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	561 272,05	1	1	0
9	Rehabilitation of subsided areas	ha	0	129 919,76	1	1	0
10	General surface rehabilitation	ha	1	122 909,70	1	1	122909,7
11	River diversions	ha	0	122 909,70	1	1	0
12	Fencing	m	0	140,2	1	1	0
13	Water management	ha	0,08	46 733,73	1	1	3738,6984
14	2 to 3 years of maintenance and aftercare	ha	1	16 356,80	1	1	16356,8
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
Sub Total 1							386941,246
1	Preliminary and General		46432,94952		weighting factor 2		46432,94952
					1		
2	Contingencies			38694,1246			38694,1246
Subtotal 2							472068,32
VAT (15%)							66089,56
Grand Total							538158

Noteworthy, during the Operational Phase of the proposed development, concurrent or progressive rehabilitation and rehabilitation are going to take place. If the applicant prospects according to the provisions of this piece of work, it is expected that only less than a hectare will remain for final rehabilitation at the end of the prospecting activities. The preliminary pit dimensions are estimated at 100m X 100m X 200m which can be increased to 200m X 100m X 200m if prospecting results prove to be enabling for expansion to take place. After a year or annually, the quantum of financial provision may be reviewed. This is proposed for purposes of promoting Sustainable Development.

30.1.6 Confirmation That the Financial Provision Will Be Provided

It is hereby confirmed that financial provisions will be submitted with bank guarantees to the Department of Mineral Resources and Energy.

31 Mechanisms For Monitoring Compliance and Performance Against The EMP

Table 24: Monitoring measures

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
All Prospecting Activities	Biodiversity; Heritage and Cultural Resources	Ensure that the prospecting programme is being implemented in line with the approved prospecting works programme	Geologist	Submit an annual prospecting progress report to DMRE
	Groundwater Quality; Groundwater Quality and Quantity	Pollutants (Physico-chemical parameters) Quantity Meteorological data		Monthly Quarterly
	All commitments contained in the EIA Report and accompanying EMPr.	Ensure commitments made within the approved EIA and EMPr are being adhered to.	ESHQ Department	Undertake and submit an environmental performance audit every two years to DMRE
Drilling/Trenching and Pitting Activities	Cultural Heritage Resources	Monitor groundwater quality and level; Monitor protection of areas of heritage and cultural significance, including Biodiversity, especially protected species.	Appointed drilling/excavation service provider/contractor	Quarterly inspection and reporting
Drilling/Trenching and Pitting Activities	Noise	within 500m from a drill site or trenches (If any).	Appointed drilling service provider/contractor	Monthly inspection and reporting
	Dust fall	Weekly inspections will cover the following:		
	Visual amenity	- Implementation of effective waste management		
	Soil & Vegetation	- Establish and implement a stakeholder compliant register on site and ensure that all complaints are responded to promptly.		
	Soil, Surface Water &	- Ensure that an oil spill kit is readily available.		
	Groundwater	- Ensure that all chemicals and hydrocarbons are stored within bund walls		
Socio-economic	- Ensure that the fire brake is maintained.			
Housekeeping & Maintenance				
Waste management				

<p>Post Drilling, Excavation or Pitting</p>	<p>Rehabilitation</p> <p>Groundwater Re-vegetation Stability Soil erosion Alien invasive species</p>	<ul style="list-style-type: none"> - Rehabilitation of drill pads, trenches and pits; - Records of water intersections on borehole logs - Control and minimise the development of new access tracks - Appropriate storage and handling of topsoil. <p>Ensure that monitoring is implemented to cover all prospecting activity areas. Sites should be located up and downstream of the prospecting site. Analytical suites for water quality analysis recommended</p> <p>Site walkabouts to determine the condition of facilities and identify any leaks or overflows, blockages, overflows and system malfunctions for immediate remedial action</p> <p>Measure rainfall for water balance updates where possible Monitor the external boreholes within 500m from drill post drilling (if any) or excavations. The Drill, Trench and Pit sites shall be monitored six monthly until closure certificate is obtained.</p>	<p>ESHQ Department</p>	<p>Monitoring report</p>
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SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Fauna	To minimise vegetation destruction in areas, and therefore, a habitat for wildlife; and To eliminate poaching and the extermination of animal species within the boundaries of the study area as well as the surrounding areas.	To ensure that the species diversity and abundance is not significantly reduces.	ECO/Site Manager/ Environmentalists	Monitoring will be done at rehabilitated area on an annual basis to investigate species diversity and abundance.
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining.	ECO/Site Manager/ Environmentalists	Monitoring will be done at the rehabilitated areas on a twice a year basis (mid-summer and mid-winter), where species diversity and vegetation cover will be investigated.
Topography	To minimise the reduction of land capability.	To ensure that rehabilitation post-mining slopes are stable, free draining and no slopes have an angle in excess of 20°.	ECO/Site Manager/ Environmentalists	Monitoring will be done on an annual basis to ensure that the levels and the slopes are in order.
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and to reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.	Site Manager/ECO/Site Manager/ Environmentalists	Monitoring will be done on an annual basis or after a heavy rain event.
Surface Water	To conserve water; and to eliminate the contamination of run-off and sources of surface water. To minimise impact of extreme weather conditions an opening of overflowing dams upstream.	There is one source, Vaal River, in the vicinity of the mine.	Water Supply ECO/Site Manager/ Environmentalists	Monitoring may have to be done to monitor the quality of the surface water.
Groundwater	To minimise and prevent as far as practically possible the contamination of groundwater.	No ground water is used at the beginning.	Water Supply ECO/Site Manager/ Environmentalists	Monitoring may have to be done to monitor the levels and quality quarterly.
Noise & Vibration	To control the incidence of unacceptable noise and vibration levels on site.	The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant and that which may migrate outside the plant area.	ECO/Site Manager/Foreman appointed SHE Consultant.	Annually, reports on fallout noise monitoring will be conducted as required by legislation.

Heritage Resources	To limit impacts associated with mining on Heritage Resources in the vicinity of application area.	The objective is to limit such impacts to the primary activities associated with the mining and hence to limit secondary impacts during the medium- and longer-term operational life of the operation.	ECO/Site Manager/Environmental Control Officer, Heritage Specialist, SAHRA official	If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points. Monitor Heritage and Palaeontological Resources on site against recommendations made by both Archaeologist and Palaeontologist.
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Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

- a) The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.
- b) When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- c) Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figures 4, 5 of PIA). This information will be built into the EMP’s training and awareness plan and procedures.
- d) Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- e) If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
- f) Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.

- g) If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.

If no fossils are found and the excavations have finished then no further monitoring is required.

31.1 Indicate the frequency of Performance Assessment Report/Environmental Audit Report

An environmental audit should be conducted annually and submitted to the DMRE annually. The environmental manager will conduct internal management audits against the commitments in the EMP in accordance with an annual audit plan. In the operational phase, these audits will be conducted on a quarterly basis. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

32 Environmental Awareness Plan

32.1 Manner in which applicant intends to inform employees of the environmental risks which may result from their work.

Environmental conditions will be included in any operational contracts, thereby making contractors aware of the potential environmental risks associated with the project and the necessity to prevent impacts by implementing the proposed mitigation measures. The following principles will apply to the Environmental Awareness Plan (Safety, Health and Environment):

- All personnel will as a minimum undergo general, SHE induction and awareness training; and
- The Environmental Control Officer(s) or the responsible personnel from the SHEQ Department will identify the Safety, Health and Environment (SHE) training requirements for all personnel and contractors. The training requirements will be recorded in a training need matrix indicating particular training that must be undertaken by identified personnel and contractors. The training matrix will be administered by the SHEQ Department;

Development of a training programme:

- General Awareness training. It should include a general environmental awareness training module that will need to be integrated into the induction programme. The training manual shall include a review of the Environmental Policy, a review of significant environmental aspects, a description of the EMP and the importance of compliance to its requirements, general responsibilities of personnel with regard to the EMP and a review of the emergency and corrective action procedures.

Specific environmental training:

- Specific environmental training will be in line with the requirements identified in the training matrix; and
- People whose work tasks can impact on the environment will be made aware of the requirements of appropriate procedures/ work instructions. The SHE Representative will communicate training requirements to responsible supervisors to ensure that personnel and contractors are trained accordingly.

Training evaluation and re-training:

- Effectiveness of the environmental training will be reflected by the degree of non-conformance to EMPr requirements, the results of internal audits and the general performance achieved; and
- Incidents and non-conformances raised against the EMPr will be assessed by the ESHQ manager and SHE Representative (s) determine the cause. Should it be evident that retraining is required the SHE Representative (s) will take the appropriate actions.

The Environmental topics to be covered in awareness training should include the following:

RESOURCE MANAGEMENT

- The importance of saving water;
- South Africa is a water scarce country and rivers are polluted;
- Do not throw litter into river or water drains;
- Do not dispose of oils in sewers;
- Air pollution - Climate change;
- The use of fossil fuels is increasing the amount of greenhouse gases that are discharged to the atmosphere. Share transport or use public transport;
- Don't burn any rubbish, the smoke pollutes the air;
- Plant trees, they clean the air, provide us with oxygen;
- remove the greenhouse gas carbon dioxide from the air;
- Soil conservation;
- Prevent overgrazing of farmlands, keep vegetation on the surface of the land to prevent soil erosion; and
- Plant trees.

HAZARDOUS SUBSTANCE USE AND STORAGE

- Solvent, petrol, diesel, insecticides, chlorine, detergents, chemical fertilisers are harmful to the environment and to your health. Use them sparingly and do not let them get into the water systems. Containers must be disposed of to a licensed hazardous waste disposal facility;
- Hazardous substances must be stored and used correctly;
- Ensure that 16-point Material Substances Safety Data Sheets (MSDS) are available at point of store;
- Compressed gas storage requirements; and
- Flammable substances store requirements.

INCIDENT AND EMERGENCY REPORTING

- The company must have an emergency/incident reporting system whereby environmental incidents can be reported and actioned to mitigate and follow up on.

OIL / DIESEL / PETROL SPILL CLEAN UP

- All employees who work with machines and vehicles must be instructed how to prevent and clean up an oil or diesel spill appropriately. Spill kits must be available on site, drip trays must be used when servicing vehicles.

CONSERVATION OF WATER

- Campaign to save water on site;
- Clean water is expensive and potable water must be used carefully; and
- Prevent pollution of water by preventing spills and dispose of wastes properly.

CONSERVATION OF VEGETATION

- Plants, grasses and trees are very important to our existence on the earth, they provide food, fuel, shelter, raw materials and they clean the air. Indigenous plants are especially important for *muti* and the whole ecology of life. Human activities are destroying the natural forests of the earth;
- The natural forests are the “lungs” of the planet and unfortunately, they are being cleared faster than they can be regenerated;
- EIA reports are to be compiled before virgin bush can be cleared;

- Vegetation cover reduces water and topsoil loss from the ground, do not clear vegetation unnecessarily;
- Indigenous trees provide shade, attract wild birds;
- Do not chop down indigenous trees without good reason;
- Implement a tree planting programme; and
- Remove alien invasive trees in the area such Prosopis, Syringa and Pepper trees, cactus plants.

WASTE MANAGEMENT

- Employees must be instructed on how to tell the difference between hazardous waste and general waste;
- They must know how to separate hazardous and general waste and where to dispose of these wastes in the correct way;
- Examples of hazardous waste which must be recycled or sent to companies such as AVERDA, Enviroserv, InterWaste, Waste Tech, Waste Group or any other authorised entity for disposal:
- Oil, diesel, batteries, acids, paint, thinners, electronic waste;
- Pesticides, Jik and Handy Andy;
- Old oil, old oil filters, old paint is hazardous and must not be disposed of to a general land fill. Oilkol of the Rose Foundation, Drizit, GK, SpillTech or any other authorised entity will collect old oil;
- Mercury in fluorescent light bulbs is hazardous, fluorescent lights must be handled with great care so as not to break the glass and release the mercury vapour into the air to breath;
- Examples of general wastes which can go to the municipal landfill;
- Wood, paper, plastic, glass, old PPE;
- Recycle, Reuse, Reduce, and Recover wherever possible.

32.2 Manner in which risks will be dealt with to avoid pollution or degradation of the environment

Yone STEM Frontiers (Pty) Ltd will develop and implement an Environmental Management System (EMS) that complies with the requirements of ISO14001:2004 Environmental Management Systems and is certified by the South African Bureau of Standards. Surveillance audits are conducted annually and recertification audits every third year. The proposed development's EMS addresses the following

elements of the ISO14001 standard and these, in conjunction with the environmental commitments, ensure that potential environmental impacts arising from the prospecting activities are managed appropriately:

- An environmental policy that includes commitments to prevent pollution, comply with applicable legal requirements and provides a framework for setting environmental objectives and targets;
- A register of environmental aspects and impacts with a view to implementing operational control measures to limit environmental impacts;
- A register of all applicable legal requirements to ensure legal compliance;
- A register of environmental objectives and targets that is consistent with the environmental policy and takes into account significant environmental impact and the management thereof, together with a program for achieving the identified objectives and targets;
- Resources to ensure implementation of the EMS;
- An environmental training and awareness program to ensure that persons performing tasks that could cause significant environmental impacts are aware of such impacts and are competent to perform such tasks;
- A communication procedure for internal and external communication in respect of significant environmental aspects;
- All Environmental Management System Documentation, as required by the ISO14001 standard, which includes control procedures for documents and records;
- Operational control procedures for activities that could cause significant environmental impact to ensure that correct procedures are implemented to;
- minimise potential environmental impacts;
- An emergency preparedness and response procedure that identifies potential emergency situations and potential accidents that can impact on the environment to ensure that such situations are dealt with in an appropriate manner;
- An environmental monitoring and measurement program to monitor and measure the key characteristics of the operation that can cause significant environmental impact and to gauge the success of implemented mitigation measures;
- A procedure for periodically evaluating compliance with applicable legal requirements;
- A procedure for dealing with non-conformities in terms of their identification, corrective action and preventative action;

- Audit programs and procedures that makes provision for internal and external audits focusing on implementation of the requirements of the EMS and legal requirements;
- Management reviews undertaken at planned intervals to ensure the system's continuing suitability, adequacy and effectiveness; and,
- Within the context of the principles listed above, the long-term sustainability objectives of the Mine are:
 - To avoid impacts by effective planning in order to prevent and limit possible impacts;
 - To minimize impacts by implementing decisions or activities that are designed to reduce the undesirable impact on the bio-physical and socio-economic aspects detailed in the previous sections; and
 - Rectifying impacts by rehabilitating or restoring, where applicable, the affected environment. This will include attempts at habitat re-creation, and restoring the land to the natural pre-mining land uses or to a pre-determine and approved land use.

33 Specific Information Required by The Competent Authority

Section 41 of the MPRDA and regulations 53 and 54 promulgated in terms of the MPRDA deal with financial provision for mine rehabilitation and closure.

The holder of a right as described in the relevant sections of the MPRDA and its regulations must provide the Department of Mineral Resources (DMR) with sufficient financial provision. Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the mine at that time.

The holder of a prospecting right, mining right or mining permit is required to annually assess the total quantum of environmental liability for the mining operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure) as well as the end-of-mine liability.

It is hereby confirmed that the financial provision will be reviewed annually.

34 An undertaking or affirmation by the EAP in relation to [:-]

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Report.

34.1 The correctness of the information provided in the reports

I, Sive Mlamla, hereby undertake that the information provided in the foregoing report is correct to the best of my knowledge and that the comments and inputs from stakeholder and Interested and Affected Parties have been correctly recorded in the report.

Signature of the EAP

Date: 14 August 2023

34.2 The inclusion of comments and inputs from stakeholders and I&APs

I, Sive Mlamla, hereby undertake that the information provided in the foregoing report is correct to the best of my knowledge and the level of agreement with stakeholder and Interested and Affected Parties have been correctly recorded and reported herein.

Signature of the EAP

Date: 14 August 2023

34.3 The inclusion of inputs and recommendations from the specialist reports where relevant; and

I, Sive Mlamla, hereby undertake that the information provided in the foregoing report is correct to the best of my knowledge and that the comments and inputs from stakeholder and Interested and Affected Parties have been correctly recorded in the report.

Signature of the EAP

Date: 14 August 2023.

APPENDICES
APPENDIX A
CV of EAP

**APPENDIX B
ENLARGED MAPS**

APPENDIX C
PUBLIC PARTICIPATION RECORDS

APPENDIX D1

APPENDIX D2

APPENDIX D3

APPENDIX D4

APPENDIX D5