



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BRAFT BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR 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).

NAME OF APPLICANT: TSHIHADU 2012 MINING (PTY) LTD

TEL NO: 061 489 0616

FAX NO: 086 585 9388

CONTACT PERSON: Mavhunga Ndivhudza

PHYSICAL ADDRESS: 20 Cranton Court Flat Cnr. Schoeman & Lydes Street 0002

EMAIL ADDRESS: nditwanim@gmail.com

FILE REFERENCE NUMBER SAMRAD: NW 30/5/1/1/2(12111PR)

1. 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.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND REPORT

1. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of the Practitioner:	Ramulondi Khuliso
Tel No.:	082 8811271
Fax No.:	086 443 1644
e-mail address:	ramufhi@outlook.com

ii) Expertise of the EAP

The EAP has a Bachelor of Science Degree in Geology and Geography (NQF 7- Hons Level)

Please see Curriculum Vitae attached as Appendix 2.

Summary of the EAP's past experience

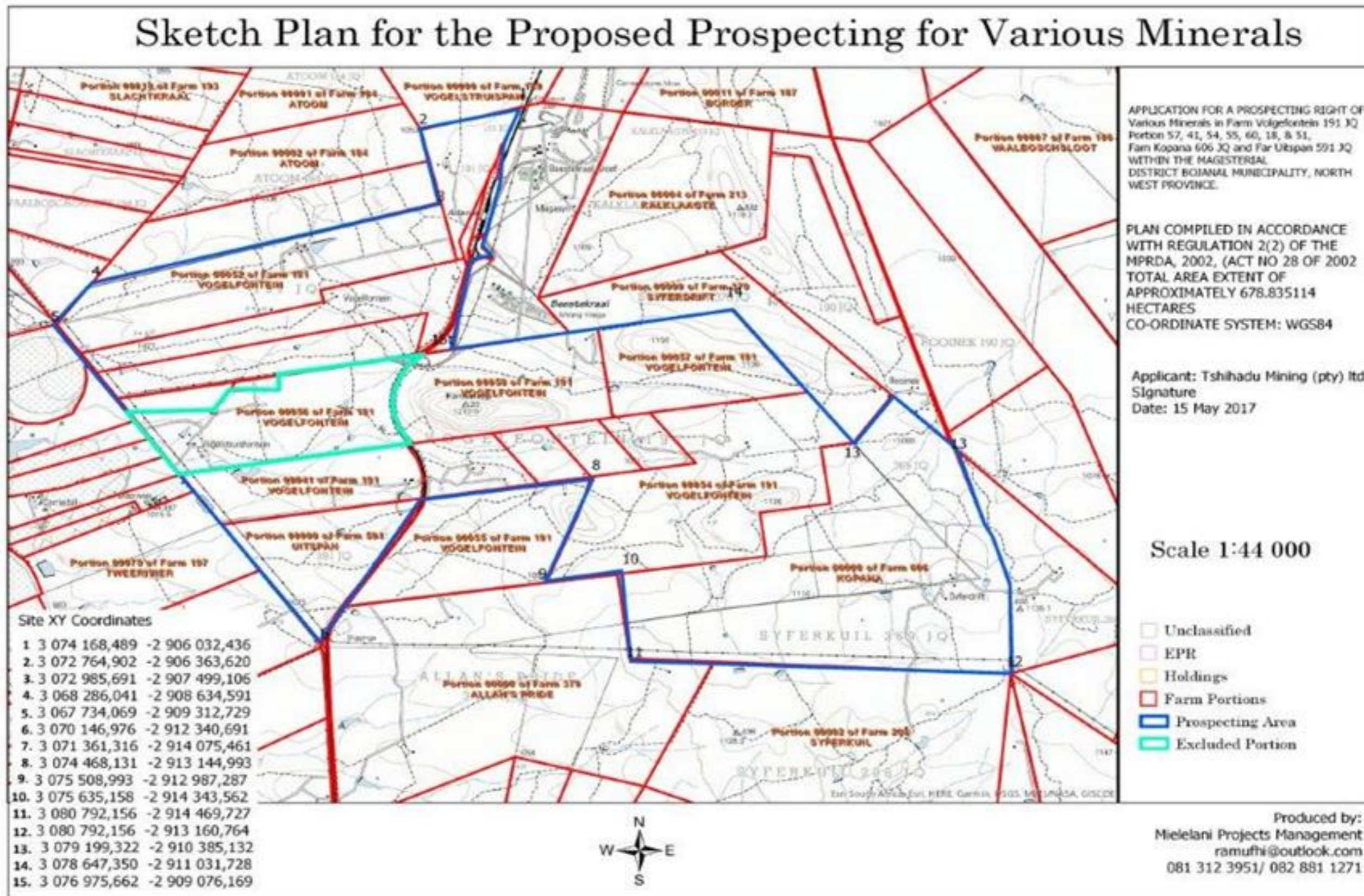
(In carrying out the Environmental Impact Assessment Procedure)

Appendix 2: The EAP has over 8 years in the mining industry. See Summary of Environmental aspects below:

- Basic assessments, WULA reports
- Water use license application
- Waste use license application
- Soil Assessment, Specialist Studies
- Prospecting and Mining right Authorizations
- Environmental Management Plans
- Public Participation
- Environmental Authorizations

b) Location of the overall Activity

Farm Name:	Portion/s 18, 41, 54, 55, 56, 57 and 60 of the farm Volgefontein 191 JQ, Kopana 606 JQ and Uitspan 591 JQ
Application area (Ha)	1087.6 ha
Magisterial district:	Brits
Distance and direction from nearest town	The site is located 50 km west of Brits town
21 digit Surveyor General Code for each farm portion	Refer to attached deeds record



d) Description of the Scope of the Proposed Overall Activity

Description of Planned Non-Invasive Activities:

1. Desktop Study

It is more of a literature review and research on all the completed work on the area, it also includes accruing results from the companies that has already worked on the area. This provides information such as geological setting, biodiversity as well as water management.

2. Geological Field Mapping

This involves the geologist walking the area and making observations which are then recorded on a map.

3. Geophysical surveys

Geophysical surveys include application of survey methods such as gravity, electrical resistivity and electromagnetic surveys. These methods detect variations between the ore body and the surrounding geological formations. These methods detect geological anomalies, and from the obtained results burial depth of ore containing bodies can be computed. Ore bodies striking directions, depth and extent can therefore be estimated based on these methods. Since various minerals will be prospected for, there will be no preferred geophysical methods thus various methods will be applied.

4. Core logging

The collected cores will be taken to offsite laboratory for analysis in order to obtain data such as lithology, mineralogy, potential geological history, geological structure, alteration zones as well as the grade of the ore. The data obtained from this analysis aid in establishing the viability of commencing with mining activities.

Description of Planned Invasive Activities:

1. Drilling

This will involve both Reverse circulation and core drilling; the drilling equipment mounted on heavy truck will be used. All means will be done to reduce the environmental damages. Purpose of the drilling activity will be to collect samples to be tested at the laboratory.

i) Listed and specified activities

Table 1: Listed Activities

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc.	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Any 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).	1042 ha	X	GNR 983 – Listing 1: Activity No. 20	N/A
The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation. The clearance will be to make way for: <u>Drill pad areas</u>	2 ha	X	GNR 983 – Listing 1: Activity 27	N/A
Equipment & Sample Storage	< 1 ha			N/A
Access Routes	< 1 ha			N/A
Site Camp Establishment	600 m ²			N/A
Ablution Facility	< 20 m ²			N/A

ii) Description of the Activities to be undertaken

The following section presents a detailed description of all the activities associated with the proposed Prospecting Application. Due to the nature of the Prospecting Works Programme, and the fact that the specific prospecting activities required are dependent on the preceding phase, assumptions are presented where required.

Table 2: Project Phases and Timeframe

Phase	Activity	Skill(s) required	Timeframe	Outcome	Completion	Outcome sign off	
1	Non invasive	Desktop study	Geologist	0-6 Months	Desktop study Report	Month 6	Geologist
2		Field mapping	Geologist	5-8 Months	Geology Maps	Month 14	Geologist
3		Geophysical survey	Geologist	8-10 Months	Anomaly Maps	Month 24	Geophysicist
4	Invasive	Preliminary Drilling and Assaying	Drillers Geologist	12-14 Months	Preliminary resources model	Month 38	Geologist, Surveyors
5		Detailed Drilling and assaying	Drillers Geologist	12 Months	Resources model	Month 50	Resources Geologist
6	Geological modelling and evaluation		Geologist	10	CPR	Month 60	Resources geologist

Description of Project Phases

1. Phase 1- Literature review

Initial Phase 1 work will include the collection and interpretation of all available data and the compilation of a Geographic Information Systems (GIS) database. The information to be collected will include aerial photos, orthophotos, aeromagnetic data, topo-cadastral maps, and geological maps, results of historic exploration programmes and any other published literature and maps. The desktop study will aid in compiling a preliminary geological model of the area to be utilized in the planning geological mapping and sighting of drill holes.

Mapping

Mapping will involve ground truthing the occurrence of the ore body within the proposed prospecting area; as shown in published geological maps. The Main Zone will be the target zone as it overlies the Critical Zone in which the ore body occur. Mapping is completed that meaningful structural and geological data may be derived from it and to confirm that the desktop study is accurate.

Test pitting

Test pitting will be conducted simultaneously with mapping to confirm the presence of Main Zone lithologies. The depth of test pits are likely to vary as all pits will be dug until natural outcrops are exposed. About five test pits each four square meters (4 m²) in size will be excavated.

2. Phase 2- Discovery drilling and sampling

The results of the Phase 1 will be used to assist in the ideal location of ten diamond drill holes at maximum depth of 1000 m. Initially, only four of the ten planned boreholes will be drilled. The objective of the initial drilling will be to confirm the occurrence of the Critical Zone within the proposed prospecting area. As a result of the known structural complexity of the area in which the proposed prospecting areas is located, initial boreholes will be widely spaced in order to increase the understanding of the overall geology. The expected depth of the Critical Zone will be guide by initial geological interpretation pre-existing data, mapping and test pitting.

Sample analysis

The drill core will be sampled where a mineralized section is intersected. The core will be split into two halves, with one half of the core taken for assay purposes and the other half being retained. Each sample will be measured and weighed and the sample lengths will be

recorded before despatch for assays at a South African National Accreditation System (SANAS) accredited laboratory. Samples will be analyzed.

3. Phase 3 – Preliminary economic assessment

A preliminary economic assessment is a study conducted to determine whether a project has the potential to be viable. At this stage, the mineralization, regardless of its quantity and quality, is always considered to be a mineral resource. This study is generally based on industry standards rather than derived from detailed site-specific data.

4. Phase 4 – Resource drilling and sampling

Subsequent to Phase 2 drilling, the results will be used to design a systematic drilling programme aimed at delineating a Mineral Resource on the Proposed Prospecting Area. The number of boreholes will depend greatly of the results of Phase 2 drilling; a minimum of five is planned thus far. This programme will be more focussed more on parts on which the ore body were intersected

5. Phase 5 – Pre-feasibility study

The pre-feasibility and feasibility studies are more detailed. By the time a decision is made to proceed with a pre-feasibility study, a preliminary mineral resource report has been finalized and an orebody model demonstrating its shape, tonnes, and grade is available. A resource cannot be converted to a reserve unless it backed up by at least a pre-feasibility study. Their results will show with more certainty whether the project is viable. At this point, the mineral resource, or a portion thereof, becomes a mineral reserve. The activities associated with the Prospecting Work Programme will be scheduled over a period of 2 years.

Description of site activities

✓ Access Roads

Access to the site will be required during mapping and drilling activities. The is existing entry point into the farm, these points will be used to gain access into the proposed property and no new entry/exit roads will be created. The internal access roads will be established to provide access to drilling locations; however, no multiple tracks will be created to access a single point. Access roads will be created such that the drilling points are connected rather than having multiple roads from the main access road to the drilling points.

✓ **Water Supply**

Currently it is not known whether there are any water boreholes located on the site and whether access and supply will be granted by the landowner. It is anticipated that water brought onto the site, will be sourced from the Local Municipality, Water will be trucked from these sources to the identified drill sites, water bowsers will be deployed to these sites as and when required.

Continuous water supply will be required during drilling, and On-site water storage tanks with a capacity of 15,000 for water supply to the drill, will be installed. Additional water requirements relate to the potable water supply for employees and workers. A temporary 260 litre on-site vertical water storage tank for drinking water and generalise by persons will be provided at the drill site. It should be noted that the water usage at the site will not constitute to water use application.

✓ **Ablution**

Ablution facilities at the drill site will involve the installation of drum or tank type portable toilets. The toilets will be emptied twice every week through the services of a registered sewage waste service provider. The ablution facilities will be provided at a ratio of 15: 1, i.e. 15 people per 1 toilet.

✓ **Temporary Office Area**

A temporary site office shaded area will be erected on site. The office will be established away from the water drainage lines. The office will be established on the south East of the site, close to the site boundary. No on-site electricity generation through the use of generators will be undertaken.

There will be no heating and/or cold storage facilities provided at the site. The employees as well as the workers will bring to site their own meals. A shaded eating area will be provided.

✓ **Accommodation**

No accommodation for staff and workers will be provided on- site and all persons will be accommodated in nearby towns (i.e Brits). Workers will be transported to and from the prospecting site on a daily basis. Night security staff will be employed once equipment is stationed onsite. No fires will be allowed on site

✓ **Storage of Dangerous Goods**

During drilling activities limited quantities of diesel fuel, oil and lubricants will be stored onsite. The only dangerous good that will be stored in any significant quantity is diesel fuel. A maximum amount of 60 m³ will be stored in above ground diesel storage tanks with elevated bunded walls.

Equipment and/or Technology to be used

- 1 drill rig mounted on a 10 tonne truck or trailer
- 2 200 Litres water tanker
- 2 X (4X4) Bakkie
- Geological Modelling Software

e) Policy and Legislative Context

Table 3: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	The project requires a prospecting right authorisation from the Department of Mineral Resources	A prospecting right was lodged with the DMR in May 2017.
NEMA Environmental Impact Assessment (EIA) Regulations, 2014	EIA should be undertaken by an independent EAP and an Application for EA should be lodged	Mutshenzhe Consulting was appointed to conduct the EIA Process.
The South African Constitution The South African Constitution (Act 108 of 1996) constitutes the supreme law of the country and guarantee the rights of all people in South Africa	Protection of civil rights of people affected by the proposed project.	A public participation process will be followed and consultations will be done regarding the proposed project. An EMPr and awareness plan will be designed according to the issues raised during this process
National Environmental Management: Biodiversity Act, 2004	Biodiversity Management	The EMPr will regulate the applicant to apply for Tree Removal Permit from the Relevant authority prior to the potential removal of any sensitive and/or protected species. SANBI database will be used to determine conservancy status as well as mitigation

		measures for alien invasive species encroaching the project area.
Section 38 of the National Heritage Resources Act (Act No. 25 of 1999)	Legislation consulted during the impact assessment process, to determine what legal requirements with regards to the management of national heritage resources were relevant to this application.	An upload of the BAR will be done on the SAHRA online system for comment
National Water Act The NWA (Act No. 36 of 1998)	The proposed activities do not require a water use license	The department has been notified of the proposed project and comments will be addressed.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004);	Dust monitoring	As part of the EMPr dust suppression methods will be used.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996);	Health and Safety	Risk Impact Assessment to be conducted
North West Provincial Spatial Development Framework (SDF) and SDF	Need and Desirability	Guideline considered during the assessment of the need and desirability of the proposed development, at the provincial scale.
Brits District Municipality IDP	Source of background demographic and socio-economic information	Utilized as a source of demographic and socio-economic information.

f) Need and desirability of the proposed activities

Prospecting activities do not offer many tangible benefits as it the initial phase of mining. Prospecting precedes mining; however, it is during the prospecting phase that findings are established on whether the available Iron Ore, Manganese, PGM, Nickel, Limestone,

Dolomite, Clay, Gold, Diamond, Copper and Vanadium seams can be mined at an economic gain. It is understood the mining plays a pivotal role in South African economy and boast a large labour force; hence a greater significance is placed on prospecting for realization of mining benefits. The highly economic valued Iron Ore, Manganese, PGM, Nickel, Limestone, Dolomite, Clay, Gold, Diamond, Copper and Vanadium seams buried within the crust are highly significance in maintaining and boosting the National Economy.

Although prospecting activities are not labour intensive, few people will be hired to assist with general activities. The services required can also be sourced locally depending on their availability thus growing the economy of Madibeng Local Municipality.

Analysis of the 'Need' of the Project

The Project is in line with the relevant IDP, SDF, EMF and PDP. There is no reason why this development should not be considered at this particular point in time considering the demand of Iron Ore, Manganese, PGM, Nickel, Limestone, Dolomite, Clay, Gold, Diamond, Copper and Vanadium in South Africa. South African mining sector is well recognized globally and brings in a lot of international investors. The opportunities that arise after successful prospecting activities are listed below, i.e. when the mine is established.

Opportunities that exist within mining are as follows:

- Constant demand on the global market for commodities;
- Establishment of a permanent working group between the Municipality and the mine managers responsible from developing local economic development initiative;
- Encourage local SMME's and entrepreneurs to take advantage of procurement;
- Develop a database of available labour and skills to encourage the employment of local people;
- Provide skills training and support programmes;

Analysis of the 'Desirability' of the Project

The proposed project is located within a highly disturbed biodiversity area and as such this project is one of the better practicable environmental options for this particular site. The Project aims to have the site utilized by an on-going, sustainable, profitable business. The proposed Project is also not anticipated to result in unacceptable cumulative impacts. There is a single stream onsite flowing towards the north of the proposed site, and as such the stream is highly avoidable.

There are no communities residing at the site, and as such no relocations need to be undertaken. Furthermore, the developers will be committed to practice environmental acceptable methods and also be enforced through legislation to comply with “*duty of care*” practice.

g) Motivation for the overall preferred site, activities and technology alternative

Preferred Site

- North West region is historically and currently known as a mineralised region. The site was preferred based on the historic geological data confirming the presence of Chrome seams under this application. From existing literature materials there are high possibilities of mineralised zones within the proposed site.
- The proposed site is located in a mining area, and is surrounded by either existing or old mines, this limit the visual impacts and since the area is considered a mining area impacts, impacts from the proposed project are well known and can be therefore easily mitigated.
- There is an existing road network offering access to the site from various directions, the R511 cut through the proposed site.
- There are no human settlements established within the proposed site which would require relocation and creates tension with the local communities.
- There is no network of surface streams which would increase potential water impact and limit vehicle, trucks and equipment movement within the site. There is a large portion of dry land available for prospecting activities.
- The site is not located within a highly ecological sensitive area with over 90 percent of the site modified either by the agricultural or mining activities.

Activity alternatives

There are activities that are traditionally associated with prospecting and had become a norm over the years. The choice of preferred activities to be undertaken during prospecting becomes very limited as there are standards guidelines or procedures to be followed. The activities undertaken will be the desktop study, geological field mapping, geophysical surveys, drilling and assaying, as well as geological modelling. These activities should be undertaken sequentially with the next depending on the success of the previous one. Supporting activities such as water supply, road development and waste management also becomes a requirement based on the site layout and primary activities requirements.

The activities will be undertaken in a most environmental friendly practicable manner, with more emphasis on protection of natural resources such as water, biodiversity and air quality.

Technological Alternatives

Technological activities preference is based on the substrata lithological formations, as well as giving account of the rock strength and the depth of buried seams. These activities depend on the preceding geophysical surveys which estimate depth and extent of the ore bodies. All infrastructures will be temporary and/or mobile.

h) Full description of the process followed to reach the proposed preferred alternatives within the site

i. Details of the development footprint alternatives considered.

a. The property on which or location where it is proposed to undertake the activity;

- **Site Accessibility**

The accessibility to the proposed sight from the local roads network was thoroughly scrutinized, as well as development of internal access roads to drilling points using heavy vehicles and machineries. A rugged terrain creates access challenges and as such should be avoided. A network of streams within the site also creates additional access challenge and also triggers other legal requirements; comprehensive stream analysis was conducted to determine the number of streams on site as well as existing stream crossings.

- **Current Land use**

Current land use was identified before the site preference choice was made avoiding human settlement.

- **Surface Water**

Surface water creates access challenges as stream crossings must be created and at the same time triggering water use legislative requirements. The site streams also limit the available land for prospecting activities as the activities should be restricted to dry lands.

- **Geological Data**

The proposed site should be known to contain chrome seam as supported by previous geological surveys either by academics, councils or independent surveys. The choice of the preferred site must be based on the geology of the area.

- **Site Sensitivity**

Environmental Sensitive and/or protected sites must be avoided when making a decision on site preference.

b. The type of activity to be undertaken;

The choice on the type of activity to be undertaken was based on the following:

- **Geological data**

The type of activity to be undertaken was purely based on the available geological data, which confirms the presence of Iron Ore, Manganese, PGM, Nickel, Limestone, Dolomite, Clay, Gold, Diamond, Copper and Vanadium seams buried at the proposed site. The proposed prospecting activity is then aimed at confirming the presence and the grade of these buried seams.

- **Socio-Economic Contribution**

The preferred type of activity must be able to significantly contribute to the local economy if not national, as well as uplifting the socio-economic status of the surrounding communities. Prospecting activity, however do not have significance impacts, but it precedes mining activity which can greatly contribute to the livelihoods of local communities and the national economy.

- **Demand for Iron Ore, Manganese, PGM, Nickel, Limestone, Dolomite, Clay, Gold, Diamond, Copper and Vanadium**

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c. The design or layout of the activity;

The layout of the site activities was based on the following:

- **Site terrain**

The drill sites were established on relatively flat areas where it is easily accessible by heavy machineries and mini drilling stations can be

established. The access roads were created such that they don't increase surface runoff speed and promote erosion.

- **Surface water**

The site layout should be established in a manner such that surface water/ streams is avoided. The surface water on site is located towards the north of the site and has been marked as a "No-Go" area.

d. The technology to be used in the activity;

- **Rock Strength**

The strength of the rock determines the drilling methods and the type of drilling equipment to be used, for instance hard rock requires drilling with diamond drills that can cut through very hard materials.

- **Equipment maintenance requirements**

There should be maintenance service providers located either locally or provincially for the preferred equipment to prospecting disruption for extended periods due to equipment unavailability.

e. The operational aspects of the activity

Storage and Material: A containerized store will be provided by the contractor, in the contractor's yard, to hold a limited store of high use items such as oils, grease, air filters etc. These stores will meet the requirements of the various health and safety and environmental legislation.

Electricity: there will be no electricity generation on site from generators. However, if the need for electricity arises during project operational phase, solar panels can be installed. Generation of electricity from fuel powered generators should be done in consultation with environmental specialist.

Water Supply: Potable water will be sourced and transported to site by the contractor. Some of the water is stored in water tanks next to temporary offices. The same water is also used for dust suppression when necessary.

Access Roads: The existing access tracks on site will be used to access drilling points. No new roads will be developed without prior communication with the landowner.

Offices: The contractor will provide a mobile office.

f. The option of not implementing the activity

The option of not approving the activities will result in a significant loss to valuable information regarding the coal reserve status at the proposed property. In addition to this, should economical reserves be present and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost and with it jobs that could have been created as well as support to the South African Economy.

ii) Details of the Public Participation Process Followed

This section of the report provides an overview of the tasks undertaken for the PPP to date. All PPP undertaken is in accordance with the requirements of the EIA Regulations (2014). Land owners were identified through a search conducted via online search engines accessing the Title Deed office database. In addition to land owners' other relevant organisations were identified and notified of the application. This includes District and Local Municipalities and State Departments with jurisdiction in the area and Non-Governmental Organisations (NGOs) as well as the general public with interest in the proposed project.

A public meeting held with the Interested and Affected Parties. The meeting introduce the project and address concerns raised.

The PPP tasks conducted for the proposed project to date include:

1. Identification of key Interested and Affected Parties (affected and adjacent landowners) and other stakeholders (organs of state and other parties);
2. Formal notification of the application to key Interested and Affected Parties (all adjacent landowners) and other stakeholders;
3. Consultation and correspondence with I&AP's and Stakeholders and the addressing of their comments; and
4. Newspaper adverts.

I&AP and Stakeholder identification, registration and the creation of an electronic database

Public Participation is the involvement of all parties who are either potentially interested and or affected by the proposed development. The principle objective of public participation was to inform and enrich decision-making. Interested and Affected parties (I&AP's) representing the following sectors of society were identified:

- National, provincial and local government;
- Agriculture, including local landowners;
- Community Based Organisations;
- Non-Governmental Organisations;
- Water bodies;
- Tourism;

- Industry and mining;
- Commerce; and
- Other stakeholders.

Formal notification of the application to key Interested and Affected Parties (adjacent landowners) and other stakeholders

The project was announced as follows:

1. Newspaper advertisement

A newspaper advert was placed on Brits Pos local newspaper on the 26 of May 2017 announcing the project, date of public participation meeting as well as when and where the Basic Assessment Report will be available and how it can be accessed.

2. Site notice placement

In order to inform surrounding communities and adjacent landowners of the proposed development, site notices were erected on site and at visible locations close to the site.

3. Written notification

I&AP's and other key stakeholders were notified of the project. A background information document and landowner notification letters were also sent out to the identified I&AP's. The BAR and EMPr will be made available for comment for 30 days from the 20th of July 2017 to the 19th of August 2017 at Madibeng Local Municipality and Madibeng Local Library.

Background Information Document

A Background Information Document (BID) was be distributed either by hand delivery, email, and fax to land owners. The BID provided information concerning the proposed project and invited I&APs to register and to attend the public meeting.

Public Meeting

A public meeting will be with the Interested and Affected Parties and the results of PPP will be attached as Appendix

Consultation and correspondence with I&AP's and Stakeholders and the addressing of their comments (continuous)

To date there has been a few acknowledgements from I&AP's, queries or registration requests have been received from stakeholders.

This report will be released to the public for review. All stakeholders and I&AP's were notified of the report's availability for comment within a specified timeframe of 30 days.

Additionally, electronic or hard copies were made available to interested and affected parties and stakeholders who request for them. Hardcopies of the report were also submitted to all organs of state and relevant authorities.

Closure Phases of the Public Participation Process

All comments and responses received and sent throughout the entire process were updated and included in the comments and responses report which is incorporated into this report for submission to the Competent Authority, Department of Mineral Resources.

iv) The Environmental attributes associated with the alternatives. (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

1. Baseline Environment

The application area Comprises of Portions of Portion/s 18, 41, 54, 55, 56, 57 and 60 of the farm Volgefontein 191 JQ, Kopana 606 JQ and Uitspan 591 JQ. The farm properties are situated in the Brits Magisterial District, in the Madibeng Local Municipality, Bojanala District Municipality, North West Province

a) Type of environment affected by the proposed activity

Topography

Much of the province consists of flat areas of scattered trees and grassland. The Magaliesberg mountain range in the northeast extends about 130 km (about 80 miles) from Pretoria to Rustenburg. The Vaal River flows along the southern border of the province.

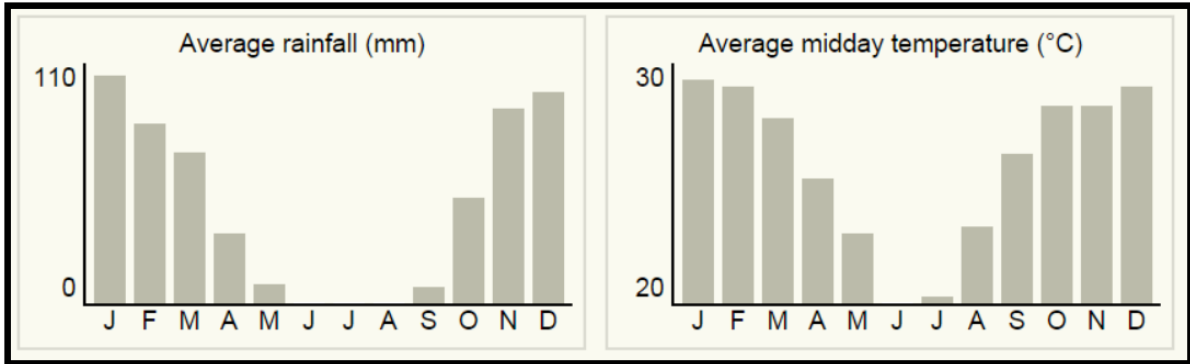
The entire site gently slopes towards north east. The highest point which is on southern side of the site is 1180m and the lowest point which is on the north west of the site is at 1120 m. Due to the undulating terrain (mountain/hills) nature of the area, land use has been restricted mostly to prospecting, residential and small crop and livestock farming.

Climate

The town of Brits is located approximately 10 km from the proposed site and the climate data of Brits will provide the most accurate climate for the proposed area. The climate of BPDM is hot and semi-arid. Long-term average maximum, minimum and mean temperatures for Rustenburg and Pilanesberg are given in the figures below. Recent data were obtained for Rustenburg (up to 2010). As expected the summer months (October to April) in Rustenburg are hot with average maximum temperatures reaching 30°C and average minimum temperatures not dropping below 12°C.

The winter months (May to September) in Rustenburg are relatively warm during the day with average maximum temperatures of 27°C. The nights do get cold with the average minimum temperatures dropping to just above freezing (3°C). The summer months (October to April) in Pilanesberg are slightly hotter than Rustenburg with average maximum temperatures of 32°C. The nights are warm with minimum averages just dropping below 20°C (18°C).

The winter months (May to September) in Pilanesberg are the same as in Rustenburg both in the day (average maximum -27°C) and during the night (average minimum - 2°C). Average temperatures in Rustenburg for the two periods presented (1961-1990 and 2000-2010) show only very small differences. It is reasonable to expect the same result for Pilanesberg and for the district as a whole.



Average rainfall and temperature

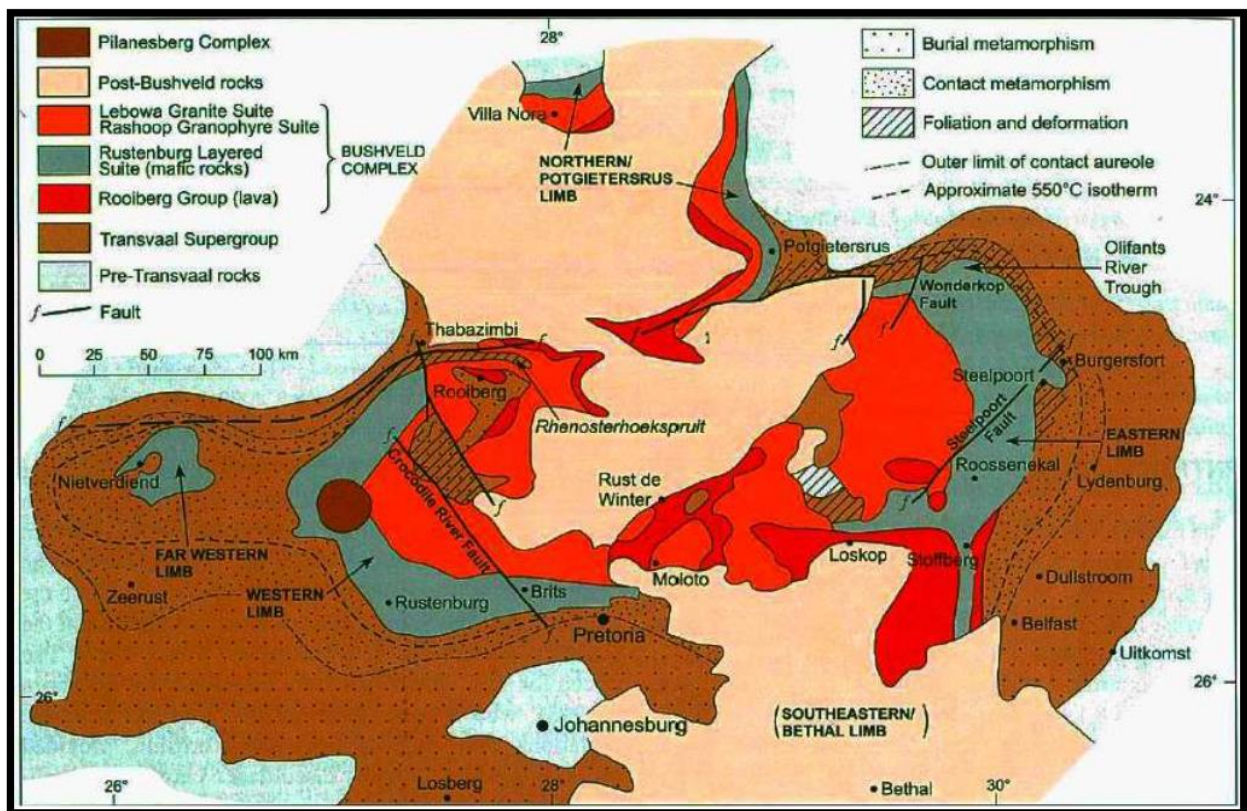
Geology

The Bushveld Complex is seated in the central northeast portion of the Kaapvaal craton and is regarded as having been emplaced in an intra-cratonic, anorogenic setting possibly related to mantle pluming. The BIC was intruded about 2,060 million years ago into rocks of the Transvaal Supergroup along an unconformity between the Magaliesberg quartzites (Pretoria Group) and the overlying Rooiberg felsites (a dominantly felsic volcanic precursor).

The BIC is by far the most economically important of these deposits as well as the largest in terms of preserved lateral extent, covering an area of over 66,000km². It has a maximum thickness of 8km, and is matched in size only by the Windimurra intrusion in Western Australia and the Stillwater intrusion in the USA (Cawthorn, 1996). The mafic component of the Complex hosts layers rich in PGEs, nickel, copper, chromium and vanadium. The BIC is reported to contain about 75% and 50% of the world's platinum and palladium resources respectively (Vermaak, 1995). The mafic component of the BIC is subdivided into several generally arcuate segments/limbs, each associated with a pronounced gravity anomaly. The Kaapvaal Craton covers an area of approximately 1.2 x 10⁶ km² and comprises predominantly granitoids interspersed with greenstone belts, covered by a variety of Neo-Archean to Mesoproterozoic sedimentary and volcano sedimentary basins (Good & De Wit, 1997). The Complex is composed of four lobes in the north, east, south and west about an east-northeast and north northwest set of axes, and it has a long axis of approximately 470 km and a short axis of approximately 380 km

Field relationships indicate that the Rashedoop Granophyre Suite (2061.8 + 5.5 Ma; Harmer & Armstrong, 2000) predates the intrusion of the Rustenburg Layered Suite (2054.4 + 2.8 Ma UPb SHRIMP; Harmer & Armstrong, 2000) and occurs as an intrusive sheet into the Rooiberg rhyolites and the Transvaal Supergroup rocks (Kleeman, 1985). The granophyres are thought to be a cogenetic, shallow intrusive equivalent of the Rooiberg Group volcanic event. The granophyres are largely thought to be derived from partial melting of the lower crust, presumably with a granitic composition (Walraven, 1982). Some varieties of granophyre, however, possibly formed as a result of metamorphic/metasomatic effects related to the intrusion of the Rustenburg Layered Suite acting on the Pretoria Group sedimentary rocks; or by the partial melting of Rooiberg Group rhyolites also a consequence of the hot intrusive magmas of the Rustenburg Layered Suite (Walraven, 1982).

The Rashedoop Granophyre Suite comprises three units based on textural variations; the Stavoren Granophyre, the Zwartbank Pseudogranophyre and the Rooikop Granite Porphyry (SACS, 1980). Many more varieties have been proposed by extensive work by Walraven (1977, 1979, 1982).



North West: Geological Map

Soils

ONE OR MORE OF VERTIC, MELANIC, RED STRUCTURED DIAGNOSTIC HORIZONS

Ea – Undifferentiated.

Soils of the application area are strongly structured cracking soils, mainly dark coloured, dominated by swelling clays (vertic soils). They may occur associated with one or more of melanic and red structured soils.



Land Capability

With regard to land capacity, the two important aspects to be considered are the grazing capacity and soil potential within Madibeng Local Municipality. Most of the land in Madibeng comprises of turf, a highly agricultural potential soil.

The Local Municipality of Madibeng is characterized by a variety of fertile soil types, pleasant climate and numerous water sources. As a result of these favourable conditions, the area is suitable for producing a variety of agricultural products. Another great advantage for agricultural activities is that the area is part of one of the largest irrigation schemes in the country. According to agriculture sources in the area, approximately 20 % of agricultural land with access to canalized water is not utilized for agricultural purposes at this moment. Irrigated vegetable farmlands cover about 130 km² around Brits, with canalized water from Hartbeespoort Dam. Approximately 18 000 ha of land is under irrigation with about 16 000 ha from the Hartbeespoort Dam irrigation Scheme and 4 000 ha from the Crocodile River.

Land with favourable soil conditions and the listed irrigation properties with access to water from irrigation canals is found along the Crocodile River which runs on the South western parts of Madibeng. As much as the majority of land in Madibeng is suitable for agricultural activity, some areas are under threat. This is attributed to fact that these areas are sensitive, as this land cannot be replaced once lost. Thus high potential agricultural land should be protected from development and mining activity.

Development and Management directives for high potential agricultural land:

- No activities or developments other than agriculture and agricultural related activities shall be permitted on high potential agricultural land.
- No township establishment shall be permitted on high potential agricultural land.

The proposed prospecting area has a moderate to high agricultural land use capability. The area is suitable for arable farming.

Biodiversity

Vegetation

Biodiversity forms one of the most crucial environmental considerations of a development and it is used to formulate decisions pertaining to activities with significant environmental impacts. The inclusion of biodiversity in decision making has been aimed to bridge a gap between economic development and land destruction, thus mitigating the environmental effects these developments may pose while still maintaining a functioning biodiversity. Therefore, as part of the EIA guidelines it is important to assess the potential impact of these proposed activities as they can impact directly or indirectly on the receiving environment. In general, biodiversity represents the variety of species within a specified ecosystem and can thus be used to assess the ecosystem health. The Southern African region contains nine biomes namely, desert, succulent Karoo, fynbos, Nama-Karoo, grassland, savanna, Indian Ocean coastal belt, Albany thicket and forest.

North West Province contains two of South Africa's nine biomes: Most of the Province (71%) falls within the Savannah Biome with its associated Bushveld vegetation. The remainder falls within the Grassland Biome, which contains a wide variety of grasses typical of arid areas. The proposed site falls within the Savanna Biome (Figure below) which covers approximately 28% of South Africa and is the dominant biome on the central plateau and inland areas of the eastern subcontinent (Manning, 2009).

The Savanna Biome is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the Lowveld and Kalahari region of South Africa and is also the dominant vegetation in Botswana, Namibia and Zimbabwe.

It is characterized by a grassy ground layer and a distinct upper layer of woody plants. Where this upper layer is near the ground the vegetation may be referred to as Shrubveld, where it is dense as Woodland, and the intermediate stages are locally known as Bushveld.

The environmental factors delimiting the biome are complex: altitude ranges from sea level to 2 000 m; rainfall varies from 235 to 1 000 mm per year; frost may occur from 0 to 120

days per year; and almost every major geological and soil type occurs within the biome. A major factor delimiting the biome is the lack of sufficient rainfall which prevents the upper layer from dominating, coupled with fires and grazing, which keep the grass layer dominant. Summer rainfall is essential for the grass dominance, which, with its fine material, fuels near-annual fires. In fact, almost all species are adapted to survive fires, usually with less than 10% of plants, both in the grass and tree layer, killed by fire. Even with severe burning, most species can resprout from the stem bases.

The grass layer is dominated by C 4-type grasses, which are at an advantage where the growing season is hot, but where rainfall has a stronger winter component, C 3-type grasses dominate. The shrub-tree layer may vary from 1 to 20 m in height, but in Bushveld typically varies from 3 to 7 m. The shrub-tree element may come to dominate the vegetation in areas which are being overgrazed.

Most of the savanna vegetation types are used for grazing, mainly by cattle or game. In the southernmost savanna types, goats are the major stock. In some types crops and subtropical fruit are cultivated.

Sensitive sites were identified by the National Protected Area Expansion Strategy (NPAES), Threatened Ecosystems, Provincial Biodiversity Conservation Plan and Birdlife's Important Bird Areas programme. Land use transformation is one of the key risks to the Savanna habitats and has significant influence on the habitat quality, occurrence of species of conservation concern and ecosystem services provided. Prospecting and bulk sampling will result in the disturbances to vegetation and could affect habitat quality. The scale of physical disturbances to the land surface is expected to be medium, given that parts of the location of the land is already transformed by previous agricultural activities and mining activities.

Conservation of savanna is good in principle, mainly due to the presence of the Kruger and Kalahari Gemsbok National Parks within the biome. However, this high area conserved in South Africa, belies the fact that half of savanna vegetation types are inadequately conserved, in having less than 5% of their area in reserves. However, much of the area is used for game-farming and can thus be considered effectively preserved, provided that sustainable stocking levels are maintained. The importance of tourism and big game hunting in the conservation of the area must not be underestimated.

Sensitive and Protected Areas

No formally protected areas occur near the sites. The North West Biodiversity Conservation Plan (NWBCP) identifies both terrestrial and fresh water priority areas in terms of reaching biodiversity targets. According to the NWBCP, the Marikana Thronveld (SVcb6) is

considered a threatened ecosystem with a “Vulnerable” status both these sites fall within this vegetation type.

In terms of strategic spatial planning, using tools such as the North West Biodiversity Conservation Plan (NWBCP), it is important to consider the Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) (<http://bgis.sanbi.org/northwest/project.asp>). Both sites falls within a Critical biodiversity category 2 area (<http://bgis.sanbi.org/northwest/project.asp>). CBA's are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services (SANBI 2007). These form the key output of a systematic conservation assessment and are the biodiversity sectors inputs into multi-sectoral planning and decision making tools.

Fauna

This report discusses the ecology of the project area. The presence of suitable habitat was used to deduce the likelihood of presence or absence of species, based on scientific literature, field guides and databases. Although no detailed animal surveys were done, several sources pertaining to vertebrates and invertebrates and their distribution in the region were reviewed. The data of previous surveys conducted in the vicinity (such as the Flora and Fauna Report by Nema Consulting, September 2012) of the proposed development area was utilized and are included in this report. All animals and signs of animals observed were recorded.

Mammals are sensitive to disturbances and habitat destruction and degradation. As such more mammal species would occur on or near the relatively undisturbed proposed project areas than near the residential areas.

The Virtual Museum listed 30 species for the 2527DB grid. Thirteen mammals were recorded during previous EIA studies (Anderson-Dinaledi 400 kV Transmission Line Draft EIA) in the area including Black-backed Jackal, Honey Badger, Scrub Hare (*Lepus saxatalis*), Four-striped Mouse (*Rhabdomys pumilio*) and Southern Multimammate Mouse (*Mastomys coucha*). No sensitive or endangered mammals were visually recorded during this study.

In terms of avifauna, the study area falls within the Magaliesberg and Witwatersberg (ZA018) Important Bird Area (IBA). IBAs form a network of sites, at a biogeographic scale, which are critical for the long-term viability of naturally occurring bird populations. The nearby MPNE provides a suitable habitat for Red data bird species that are known to occur in the area such as the Cape Vultures and other eagles.

The likely occurrence of key bird species was verified according to Southern African Bird Atlas Project 2 (<http://sabap2.adu.org.za/>) from the University of Cape Town's Animal Demographic Unit for the grid cells 2527DB. It must be emphasized that the specific habitat(s) found on site may not suit the particular Red Data species, even though it has been recorded for the quarter degree grid cells.

Air Quality

Existing ambient air quality for the entire district is poorly understood at present. Good quality ambient air pollution measurements have only been made over the past decade in the industrial-urban region surrounding Rustenburg. The other areas of the district have little to no ambient measurements to evaluate the current status of the air quality.

Due to this uneven distribution of measurements it was decided to firstly evaluate ambient air quality utilising dispersion modelling, in particular CALPUFF dispersion model. The measurements that are available will then be presented and provide a basis to evaluate the dispersion modelling and confirm the distribution of air pollution over the entire district as predicted by the model. The sources in the district and how they have been included in the modelling process is described first.

Baseline Emission Inventory

An emissions inventory for Bojanala Platinum District was compiled for air pollution sources where information was available or where emission factors could be applied to quantify emissions. Potential air pollution sources in Bojanala have been identified as:

- Industrial operations,
- Mining activities,
- Agricultural activities,
- Biomass burning
- Domestic fuel burning
- Vehicle tailpipe emissions,
- Waste treatment and disposal (landfills and incineration),
- Vehicle entrainment of dust from paved and unpaved roads,
- Other fugitive dust sources such as wind erosion of exposed areas.

Particulate and gaseous emissions from industrial operations, domestic fuel burning and vehicle tailpipe emissions were quantified for this assessment, due to the availability of Bojanala Platinum District Municipality AQMP 82 data for these sources. Ambient pollutants that were assessed include the criteria pollutants, SO₂, and PM₁₀.

NOISE

Some of the noise generating activities associated with the project may cause an increase in ambient noise levels in and around the site. This may cause a disturbance to nearby receptors. As a baseline, this section provides a brief description of pre-prospecting conditions in the area from which to measure changes as a result of project-related noise.

REGIONAL SOCIO-ECONOMIC STRUCTURE

(North West) Bokone Bophirima Province is bordered by Botswana in the north and is fringed by the Kalahari desert in the west, Gauteng to the east, and the Free State to the south. It is known as the "Platinum Province", owing to its wealth of this precious metal. The province has a population of 3, 2 million people who mainly speak Setswana.

The mainstay of the economy of Bokone Bophirima Province is mining, which generates more than half of the province's gross domestic product and provides jobs for a quarter of its workforce. The chief minerals are gold, mined at Orkney and Klerksdorp; uranium, mined at Klerksdorp; platinum, mined at Rustenburg and Brits; and diamonds, mined at Lichtenburg, Christiana, and Bloemhof.

The northern and western parts of the province have many sheep farms and cattle and game ranches. The eastern and southern parts are crop-growing regions that produce maize (corn), sunflowers, tobacco, cotton, and citrus fruits. The entertainment and casino complex at Sun City and Lost City also contributes to the provincial economy.



Locality of the North West Province

Bojanala Platinum District Municipality (BPDM) is one and the largest of the four district municipalities within North West Province. The district is located in the north-eastern side of the North West province and also shares boundaries with municipalities in other provinces listed as follows:

- Waterberg District Municipality to the north
- West Rand District Municipality to the south-east
- City of Tshwane Metropolitan Municipality to the east;
- Dr Kenneth Kaunda District Municipality to the south; and
- Ngaka Modiri Molema District Municipality to the west.

The district comprises of five (5) local municipalities. The local municipalities are Kgetlengrivier, Madibeng, Moretele, Moses Kotane, and Rustenburg.



Map of the Bojanala District

Socio economic

High population concentration is experienced in local municipalities with the highest economic activities. Rustenburg local municipality has the highest population as compared to the other four locals, followed by Madibeng and then Moses Kotane.

According to the 2007 Community Survey report, majority of the population in the district falls within the category of 20-39 years at 34.9%, followed by the category of 19 years and

younger at 36.5%. The figures also show that nearly 55% of the population is economically active, which leaves out 7.9% population within the 60 years and older category. The 36.5% of the 19 years and younger categories informs that a significant number of young people (currently younger than 19 years of age) will be entering the labour market over the next 5-10 years and would be seeking employment opportunities. It also signifies a specific need for social amenities such as schools and health care.

The education status of the population older than 20 years of age indicates that the district labour market is characterized by low skills levels. As much as 15.1% of the population older than 20 years have not received any form of schooling and a further 19.7% only some primary education. These figures imply that nearly 35% of the total adult population can be regarded as functionally illiterate. Conversely, only 20.1% of the adult population has completed their high school education and only 5.5% has obtained some form of tertiary education.

Bojanala DM has a marginally higher unemployment (21.6%) rate compared to the North West Province (20.4%) and South Africa. Within the Local Municipalities Kgetlengrivier and Moses Kotane have the highest unemployment rates with an estimated 27.6% and 26.5% of the population unemployed respectively. Although Moretele LM is estimated to have the lowest unemployment rate in the LM it should be noted that 53.8% of the population are not economically active. Rustenburg LM has the highest employment rate with an estimated 54.9% of the population employed.

Surface Hydrology

The project is located in the Crocodile West Water Management Area. The Crocodile (West) and Marico Water Management Area (WMA) is defined by the following Catchments: Crocodile River, Marico River, South African portion of Ngotwane River and the Upper Molopo River. The area forms part of the Limpopo River basin, which spans the four countries of Botswana, Zimbabwe, South Africa and Mozambique. The area covers approximately 48 000 km² with the largest being the Crocodile River catchment (29 349 km²) followed by the Marico River catchment (12 049 km²). The remainder is covered by the Ngotwane River and Upper Molopo River catchments at approximately 5 000 km² and 1 800 km² respectively. The WMA includes the tertiary drainage regions: A10, A21 to A24, A31, A32 and quaternary drainage region D41A.

The Crocodile West and Marico WMA is one of the many water stressed catchments in South Africa. Surface water resources are used extensively, particularly in the Crocodile River catchment, with the main water users being agriculture, industry, mining and urban.

Agriculture accounts for about 33.5% of total use and largely utilizes privately owned dams and Government water schemes. Rand Water, Magalies Water and the North West Water Authority supply most of the mining, industrial and domestic sectors with water from sources within the catchment as well as from transfers from the Upper Vaal River system, which receives a significant amount of return flow from Tshwane. Approximately 70% of the population within the WMA lives in urban areas. The main economic activities revolve around mining, agriculture and light industry

The proposed prospecting area falls within the A21J quaternary catchment in the Crocodile (West)/Marico Water Management Area (WMA). The Madibeng Local Municipality is supplied by Magalies Water from the Hartbeespoort Dam, but many people use boreholes for domestic supply.

The southern portion of the Upper Crocodile Sub-area is highly developed with the large industrial, urban and semi-urban sprawls of northern Johannesburg, Midrand and southern Tshwane. Large volumes of water are transferred from the Vaal River System, via the Rand Water supply system.

Significant irrigation and mining activities are present in the area to the north of the Magalies Mountain Range.

Heritage Resources

The site is located in a rugged terrain and it is expected that no humans were dwelling there and as such no artefacts of heritage importance may be present on site. However, the possibility of these artefacts has not been totally ruled out and where such are discovered the SAHRA and the SAPS will be notified with immediate effect.

b) Description of the current land uses

Land use in the North West area includes game and cattle farming, hunting and ecotourism with the inclusion of mining activities as its one of the major contributing economic factors in the province. The majority of the land is privately owned. There has been a marked change in the agricultural practices in the North West section with many cattle farms being converted to game farms that include hunting activities as well as mining. The area is described as largely as a mining area or mining province.

v. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed

Table 4: List of Potential Impacts

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence				Where (E + D + I) X P = Significance						
Activity	Potential Impact	Causes	What are the Consequences?	Rating Before Mitigation				Significance Before Mitigation	Impact Reversal	Irreplaceable loss of resources
				E	I	D	P			
Desktop Study	No Impacts	N/A								
Site Establishment	Loss of Biodiversity	Clearing vegetation for camp and access road establishments.	Disturbance of the natural ecosystem	1	1	1	2	6 Negative	2	1
	Soil Contamination through	<ul style="list-style-type: none"> Fuel leaks and spillage from vehicles and storage tanks. Compaction resulting from vehicle movement. 	Loss of soil fertility	1	1	1	1	3 Negative	1	1
	Water resource exploitation	Excessive water requirement for machinery and dust suppression	Water shortages	1	1	1	2	6 Negative	1	1
	Social Conflicts	Conflicts with local community members who seek	Property Vandalism and	1	1	1	1	3 Negative	1	1

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence				Where (E + D + I) X P = Significance						
Activity	Potential Impact	Causes	What are the Consequences?	Rating Before Mitigation				Significance Before Mitigation	Impact Reversal	Irreplaceable loss of resources
				E	I	D	P			
		employment and/or feel that they are exploited for land.	Criminality							
	Employment Opportunity	General labour will be required to assist with prospecting activities	Employment of local people and growth of local economy.	1	1	1	3	9 Positive	2	1
Geophysical Survey	Loss of Biodiversity	Clearing vegetation to make way for establishment of reading taking stations	Disturbance of the natural ecosystem	1	1	1	1	3 Negative	1	1
	Crust tremor	Thumping of the crust to create waves for readings by the geophones.	Shock waves among localised faunas							
	Noise generation	Site fly overs for remote sensing.	Noise impact on the live stocks, and also on the community	1	2	1	2	8 Negative	1	1
Drilling	Soil and Geology disturbance	Drilling holes reaching the water table	Contamination of Groundwater where the water table is shallow.	1	1	1	1	3 Negative	1	1

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence				Where (E + D + I) X P = Significance						
Activity	Potential Impact	Causes	What are the Consequences?	Rating Before Mitigation				Significance Before Mitigation	Impact Reversal	Irreplaceable loss of resources
				E	I	D	P			
		<ul style="list-style-type: none"> Unstable drill hole openings. Unstable subsurface lithological structures 	Ground instabilities creating minor fissures and cracks, increasing erosion risk	1	1	1	2	6 Negative	1	1
	Waste generation and storage	<ul style="list-style-type: none"> Used chemical containers Contaminated soils Contaminated water Improper handling of hazardous and general waste. Littering 	<ul style="list-style-type: none"> Water Security threat. Loss of biodiversity Fines from authorities. 	2	1	2	2	10 Negative	1	1
	Groundwater Contamination	Drilling holes reaching the water table, and at some instances creates surface flow further lowering the water table.	Water shortages for Agricultural activities.	1	1	1	2	6 Negative	1	1
	Soil contamination	Spillages and leaks of hydrocarbons from vehicles and drilling rigs.	Loss of fertility, water contamination and loss of biodiversity	1	1	1	2	6 Negative	1	1

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence				Where (E + D + I) X P = Significance						
Activity	Potential Impact	Causes	What are the Consequences?	Rating Before Mitigation				Significance Before Mitigation	Impact Reversal	Irreplaceable loss of resources
				E	I	D	P			
	Soil Compaction	Vehicle movement	<ul style="list-style-type: none"> Loss of soil fertility Driving over micro fauna 	1	1	1	2	6 Negative	1	1
	Noise nuisance	Noise from drilling equipment	Disturbance of quiet farm environment leading farm animals into distress.	1	1	1	2	8 Negative	1	1
	Release of Sulphides gas	The drill holes being the exit pipe for buried sulphides	Bad odour	1	1	1	1	3 Negative	1	1
Decommissioning	Soil Contamination	Hydrocarbons leakages and spillages during removal of storage	<ul style="list-style-type: none"> Surface water contamination Soil infertility Loss of Biodiversity 	1	1	1	2	6 Negative	1	1
	Waste generation		<ul style="list-style-type: none"> Littering Water Contamination Soil Contamination 	1	3	1	2	12 Negative	1	1

vi. Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

- **Nature:** A brief written statement of the environmental aspect being impacted upon by a particular action or activity.

- **Extent:** The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale;

- **Duration:** Indicates what the lifetime of the impact will be;

- **Intensity:** Describes whether an impact is destructive or benign;

- **Probability:** Describes the likelihood of an impact actually occurring; and

- **Cumulative:** In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Criteria Used for Rating of Impacts

CRITERIA	DESCRIPTION			
Extent	National (4) The whole of South Africa	Regional (3) Provincial and parts of neighbouring provinces	Local (2) Within a radius of 2 km of the construction site	Site (1) Within the construction site
Duration	Permanent (4) Mitigation either	Long-term (3) The impact will	Medium-term (2) The impact will	Short-term (1) The impact will

	by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	last for the period of the construction phase, where after it will be entirely negated	either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
Intensity	Very High (4) Natural, cultural and social functions and processes are altered to extent that they permanently cease	High (3) Natural, cultural and social functions and processes are altered to extent that they temporarily cease	Moderate (2) Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	Low (1) Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
Probability Of Occurrence	Definite (4) Impact will certainly occur	Highly Probable (3) Most likely that the impact will occur	Possible (2) The impact may occur	Improbable (1) Likelihood of the impact materialising is very low
Impact Reversal	Highly Impossible (4) Impact reversal will certainly be impossible	Moderate (3) Impact can be reversed to some extent with loss of natural resources	Possible (2) High possibility of impact reversal	Definite (1) Impact can be totally reversed
Loss of irreplaceable resources	Definite (4) Resources definitely be lost	Highly Probable (3) Most likely that resources will be lost	Possible (2) Resources may be lost	Improbable (1) Loss of resources is highly unlikely

Significance is determined through a synthesis of impact characteristics. Significance is also an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Table 5: Criteria for Rating of Classified Impacts

Low impact/ Minor (3 -10 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
Medium impact/ Moderate (11 -20 points)	Mitigation is possible with additional design and construction inputs.
High impact (21 -30 points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact/ Major (31 - 48 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.
Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse.
It is important to note that the status of an impact is assigned based on the status quo – i.e. should the project not proceed. Therefore not all negative impacts are equally significant.	

The suitability and feasibility of all proposed mitigation measures is included in the assessment of significant impacts. This was achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

Positive Impacts

- The project will provide resolute and sound surface water management streams onsite that will be continued even after the project has ceased. The buffers will be created around all surface water courses, ponds and dams.
- The prospecting activities will confirm the presence or absence of the coal reserves, and thereafter the area can be properly zoned, in the absence of coal reserves, an informed decision on land zoning can then be taken. For instance, human settlement zoning will be probable as no future relocations will be required to make way for mining, and if zoned for agriculture, extensive agricultural developments and investment can then be implemented.
- The prospecting results either positive or negative will curb the illegal mining activities, if positive results are yielded the applicant will ensure that the sight is safely secured and access into the site is controlled. The negative results would also discourage illegal miners who would gambled on the existence of coal reserve. The existence of proven knowledge on the geological substrata would push illegal miners off site.
- There is an existing roads network surrounding the site and there will be no need to create access roads. This would ensure that erosion and ecological disturbances are minimized.
- While no significant short term positive socio-economic impacts are associated with the prospecting activities, in the event that a viable reserve is confirmed, there would be high degree of positive impacts such as employment of large number of local residents, socio-economic balance of the local community and on the National and Provincial scale mining contribute highly to the Gross Domestic Product (GDP).

Negative Impacts

- The proposed site is surrounded by residential areas and as such the noise nuisance generated at the prospecting site will be felt by the local community. However, the noise is within tolerable range and consultation will be done with the communities before the activities are undertaken.

- Possibilities of ground water disturbances exists, as drilling may be carried out on aquifers and as a result water table may be lowered and the water quality compromised. Ground water detection techniques will be implemented before drilling is undertaken to ascertain the presence/absence of aquifers
- The proposed project will definitely generate wastes, the wastes will be contained on site, hazardous will be separated from general wastes and each will be disposed of at a permissible registered waste facility.
- Safety risks – the surface excavations create safety risks to both local community and livestock within the farm.
- Criminal Activities – The equipment on site will attract criminal activity. The community and the site crew may clash over the loss or unauthorised access into the site camp.

viii) The possible mitigation measures that could be applied and the level of risk

Measures to manage Noise

- The community members will be notified of the commencement of prospecting activities, and the activities will be restricted to day time, i.e. from 07:00 to 18:00.

Heritage Impact Management

- Should any unknown heritage sites be identified during the drilling activities, all activities shall cease immediately and the South African Police Service as well as the SAHRA be contacted and an appropriate Heritage Impact Assessment should be undertaken on the site.

Influx of Labour to site

- Casual labour will not be recruited at the site to eliminate the encouragement for persons travelling to site seeking employment.
- If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.
- No unauthorised personnel should be allowed on site. The workers should have a form of identity card with them at all times.

Visual Impact

- Wet dust suppression should be undertaken to manage dust emissions from vehicle movement and other activities as and when needed.
- The portable ablution facilities, water tanks and any other infrastructure should be acquired with consideration for colour, natural earth, green and mat black options which will blend in with the surrounding area.
- Waste management system will be implemented and sufficient waste bins will be provided for on-site.
- The site camp should be established away from the residential areas.

Water and Soil Impact Management

- Existing tracks and roads will be used as far as is practicable to minimize the potential for soil erosion. In instances where access to drill sites are to be established, and if required, raised blade clearing will be undertaken to maintain vegetation cover limiting soil erosion potential.
- Soil disturbances are to be limited as far as practicable to minimize the potential for soil erosion thus disturbances should only be at the drilling points only.
- When establishing the drill pad, topsoil including the remaining vegetation, will be stripped and stockpiled up-slope of the pad. The stockpile will be shaped to divert storm-water around the drill pad to minimise soil erosion of the pad. Stockpiled topsoil will be used during rehabilitation activities.
- Topsoil will be stockpiled to a maximum height of 1.5 m with a side slope of not more than 1:3.
- To reduce the potential for water pollution during the drilling activities, a sump will be constructed with sufficient capacity to receive drill fluids and allow for evaporation.
- The sump will be constructed to divert storm water away and/or around the sump to avoid storm water inflow.
- Oils and lubricant will be stored within secondary containment structures
- Mixing of concrete or cement should be done on an impermeable board.
- Topsoil should be handled only twice, when removing and during rehabilitation.
- The movement of the vehicles should be restricted to minimise soil compaction. In the morning all the equipment and materials to be exported should be delivered at once.

- In the event that vehicle maintenance is undertaken on site, drip trays and / or UPVC sheets will be used to prevent spills and leaks into the soil.
- Waste separation will be undertaken at source and separate receptacles will be provided (i.e. general wastes, recyclables and hazardous wastes).
- Receptacles will be closed (i.e. fitted with a lockable lid) to eliminate the possibility of access by animals overnight.
- Wastes will be removed and disposed of at an appropriately licensed landfill and recyclables will be taken to a licensed recycling facility.
- Drill holes must be permanently capped as soon as is practicable.

ix) Motivation where no alternative sites were considered

- The proposed prospecting area is targeted based on the existing geological data which confirms that coal reserves may be buried at the proposed site.
- There is sufficient open area with no settlements or any economic activities that could possibly create conflicts with the land owners.
- There are no heritage significance artefacts known to be on site.
- The watercourses are limited to the northern boundary of the site, providing abundant dry area within the site where prospecting activities can be undertaken with minimal or no impacts on the surface water.
- There is a network of existing roads, and as such no new roads need to be created, thus minimizing soil erosion as well as impacts on local ecology.
- The site relief is relatively flat, sloping gently towards the north, and as such vehicle and equipment movement on site will not degrade existing roads and increase erosion rate. The site relief also creates ideal environment with limited safety concerns.
- The region is already known for Chrome mining and as such impacts mitigation measures are a common practice.

x) Statement motivating the alternative development location within the overall site

The activities on site were strategically located such that impacts on surface water is minimized or eliminated where possible. The site layout was also influenced by the site relief, driving along the contours, rather than driving uphill. The drilling stations will also

be established on relatively flat area, to minimize requirements for ground levelling and bringing in additional structure support.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site

In order to identify the potential impacts associated with the proposed prospecting activities the following steps were undertaken:

- The stakeholder consultation process was undertaken in an interactive manner, providing landowners and identified stakeholders with the opportunity to provide input into the project. This was a key focus, as the local residence has capabilities of providing site specific information, which may not be available in desktop research material. Stakeholders are requested to provide their views on the project and any potential concerns which they may have. All comments and concerns are captured and incorporated into the impact assessment.
- A detailed desktop investigation was undertaken to determine the environmental setting in which the project is located. Based on the desktop investigations various resources were used to determine the significance and sensitivity of various environmental factors. The desktop investigation involved the use of:
 - Department of Water Affairs and Sanitation's information documents such as the ground water vulnerability report.
 - Municipal Integrated Development Plan
 - Municipal Strategic Development Framework
 - South African National Biodiversity Institute GIS Map
 - The geological map of South Africa
 - South African National Biodiversity Institute (SANBI) Biodiversity Geographic Database LUDS system
 - Geographic Information System base maps;
- A site visit was conducted to ensure that the information gathered as part of the Desktop investigation reflects the current status of the on-site.
- The ratings of the identified impacts were undertaken in a quantitative manner as provided in Impact Assessment Section. The ratings were undertaken in a manner to calculate the significance of each of the impacts. The EAP also assesses the outcomes of

the calculation to determine whether the outcome reflects the perceived and the actual views.

- The identification of management (mitigation) measures were done based on the significance of the impacts and measures that were considered appropriate and successful, were adopted as Best Practical and Economical Options.

j) Assessment of each identified potentially significant impact and risk

Table 6: Impact Assessment

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
Desktop Study	None Identified	N/A	Planning Phase	N/a	No mitigation Proposed	
Identification of legislative requirements	Commencement of activities without all the required licenses and permits	Policy and legal Requirements	Planning Phase	Very High (-ve)	Control through ensuring that all relevant legislations and regulations have been adhered to before commencement of the project.	Insignificant
Camp establishment site	Removal of vegetation at the camp site and the access roads	Flora and Fauna	Planning Phase	Medium (-ve)	<ul style="list-style-type: none"> ✓ The size of the construction camp should be kept to a minimum. ✓ The camp site must be established away from the natural drainage areas. 	Low (-ve)
	Contamination of surface water from the site construction activities	Hydrology	Planning Phase	Medium (-ve)	<ul style="list-style-type: none"> ✓ The contractor must attend to the drainage of 	Low (-ve)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
	Compaction of soil at the camp site and the access roads	Geology and Soils	Planning Phase	Medium (-ve)	<p>the camp site to avoid standing water and / or sheet erosion.</p> <ul style="list-style-type: none"> ✓ Temporary chemical toilets must be provided by a registered service provider. These toilets must be made available for all site staff. The construction of "long drop" toilets is forbidden. ✓ Under no circumstances may open areas or the surrounding bush be used as a toilet facility. ✓ Bins and / or skips shall be provided for disposal of waste within the construction camp. ✓ Bins should have liner 	Low (-ve)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
					<p>bags for efficient control and safe disposal of waste.</p> <p>✓ Recycling and the provision of separate waste receptacles for different types of waste should be encouraged.</p>	
Site camp establishment	Conflicts with the locals	Socio-Economic Issues	Planning Phase	Medium (-ve)	<p>The community must be briefed regarding the prospecting activities to be undertaken.</p> <p>The number of employees required and the employment methods should be communicated.</p>	Low (-ve)
	Creation of employment opportunities	Socio-Economic	Planning Phase	Medium (+ve)	<p>The recruitment policy should be effectively communicated</p> <p>Employment should not be</p>	Medium (+)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
					done at the camp site or at the working sites. All the employments should be done through the Local Leaders	
	Conflicts over employment preferential and lack of support for the project from the locals	Socio-Economic	Planning Phase	Medium (-ve)	<p>The number of employees required and the employment methods should be communicated.</p> <p>Employment should not be done at the camp site or at the working sites. All the employments should be done through the Local Leaders</p>	Low (-ve)
Chipping of outcrops to obtain samples	Body injuries or death at a worst case	Health and Safety	Field Mapping	Medium Significance (Negative)	The Geologists conducting field mapping should wear protective clothing.	Insignificant
Encounter with dangerous wild	Body injuries or death at a worst case	Health and Safety	Field Mapping	Medium Significance	Repellent for snakes should be spread on the path ways.	Low (Negative)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
animals				(Negative)	All site personnel must have a working cell phone to communicate in case of emergency	
Geologist trapped in the caves	Loss of life or serious Body injuries	Health and Safety	Field Mapping	Medium Significance (Negative)	Entrance into the caves must be communicated and planned before such action is taken. The stability of the cave walls must be known.	Insignificant
Flyover planes collecting data through remote sensing techniques	Generation of noise	Noise Impact	Geophysical Surveys	High (-ve)	The flyover times should be communicated with affected parties prior activity is undertaken The schools and Hospitals should be marked as No-Go areas.	Medium (-ve)
Use of Vibrators for seismic geophysical	Tremor ground vibrations	Geology & Ground Stability	Geophysical Surveys	Low (-ve)	Residential and business areas should be marked as	Low (-ve)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
method					No-Go areas where seismic method is used.	
Set-up of Geophysical Survey Equipment	Clearing of Vegetation	Flora and Fauna	Geophysical Survey	Low (-ve)	Already cleared areas should be preferred over heavily dense areas	Low (-ve)
Set-up of Geophysical Survey Equipment	Theft	Socio-Economic	Geophysical Survey	Low (-ve)	The site camp must be secured and entrance into the site must be controlled	Low (-ve)
Preparation of drilling sites and access roads	Loss of Vegetation	Flora and Fauna	Drilling Phase	Medium (-ve)	Where possible existing access roads must be used	Low (-ve)
	Loss of micro animals during establishment of access roads	Flora and Fauna	Drilling Phase	Medium (-ve)	Search and rescue mission should be undertaken for species on drilling site	Low (-ve)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
	Contamination of surface water	Hydrology	Drilling Phase	High (-ve)	Large machinery crossing the river should be given extra care such that no chemical and oil leaks occur. No new crossing should be developed across streams without water use license.	Medium (-ve)
Preparation of drilling sites and access roads	Soil contamination	Soil & Geology	Drilling Phase	Medium (-ve)	The equipment and machinery must be monitored for leaks	Low (-ve)
Drilling Activities	Ground & Surface Water contamination	Hydrology	Drilling Phase	High (-ve)	The drill bits must be maintained in good condition to prevent leakages of oil when underground.	Low (-ve)
					Aquifer detection methods should be applied before drilling can be undertaken.	

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
Drilling Activities	Waste Generation	Waste Management	Drilling Phase	Very High (-ve)	The mud generated from the drilling activities must be contained, and contaminated mud must be handled separately, treated or disposed of at an appropriate landfill.	Medium (-ve)
					Skips and marked bins must be provided at the site for waste separation.	
					Waste water must not be released into the natural streams prior treatment	
					The mechanical wastes must be stored separately from other wastes in a skip and must be disposed of at an	

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
					<p>appropriate landfill site.</p> <p>Equipment maintenance must be done off site, and where there is need to conduct it on site, it must be done on a bunded area.</p> <p>Cleaning of equipment must be done on a bunded area.</p>	
Drilling Activities	Animals falling into drill holes	Health and Safety	Drilling Phase	Medium (-ve)	The drill holes must be barricaded overnight and when not in operation.	Low (-ve)
	Theft	Socio-economic	Drilling Phase	Medium (-ve)	Site Must be secured and Security personnel must be stationed at all points where there is equipment.	
Drilling Activities	Lowering of groundwater levels	Hydrology	Drilling Phase	Medium (-ve)	Areas with shallow aquifers must be avoided	Low (-ve)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
Drilling Activities	Removal of topsoil	Geology & Soils	Drilling Phase	Medium (-ve)	Topsoil must be located away from the drainage lines	Low (-ve)
					Contaminated soil must not be mixed with clean stockpiles	
					No chemicals should be placed near topsoil stockpiles.	
					The stockpiles must not be more than 1,5m high	
Drilling Activities	Spillages of hazardous chemicals	Soil & geology; Hydrology	Drilling Phase	Medium (-ve)	All hazardous substances must be stored in sealed containers until they can be disposed of / removed from site	Low (-ve)
					Hazardous substances / materials are to be transported in sealed containers or bags.	
					Spillages must be attended to	

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
					as soon as they occur. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.	
Drilling Activities	Destruction of Heritage Resources	Socio-Economic	Drilling Phase	Medium (-ve)	<p>There are no historically or heritage resources known to be on site</p> <p>Should any paleontological or cultural artefacts be discovered work at the point of discovery must stop, the location be clearly demarcated and SAHRA & SAPS be contacted immediately. Work at the discovery site may only be recommenced on instruction from SAHRA.</p>	Low (-ve)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE <i>In which impact is anticipated</i>	SIGNIFICANCE <i>if not mitigated</i>	MITIGATION TYPE	SIGNIFICANCE <i>if mitigated</i>
Decommissioning of Site Camp	Waste generation	Waste management	Decommissioning Phase	Medium (-ve)	Uncontaminated stockpiled materials must be used for backfilling	Low (-ve)
Decommissioning of Site Camp	Contamination of the soil and water	Soil; Hydrology	Decommissioning	Medium (-ve)	The hazardous substances onsite must be stored in marked containers.	Low (-ve)
					All the equipment must be shipped out of the site	
					The compacted soils must be loosened and topsoil spread on top, and also spreading seeds of indigenous species.	

k) Summary of specialist reports

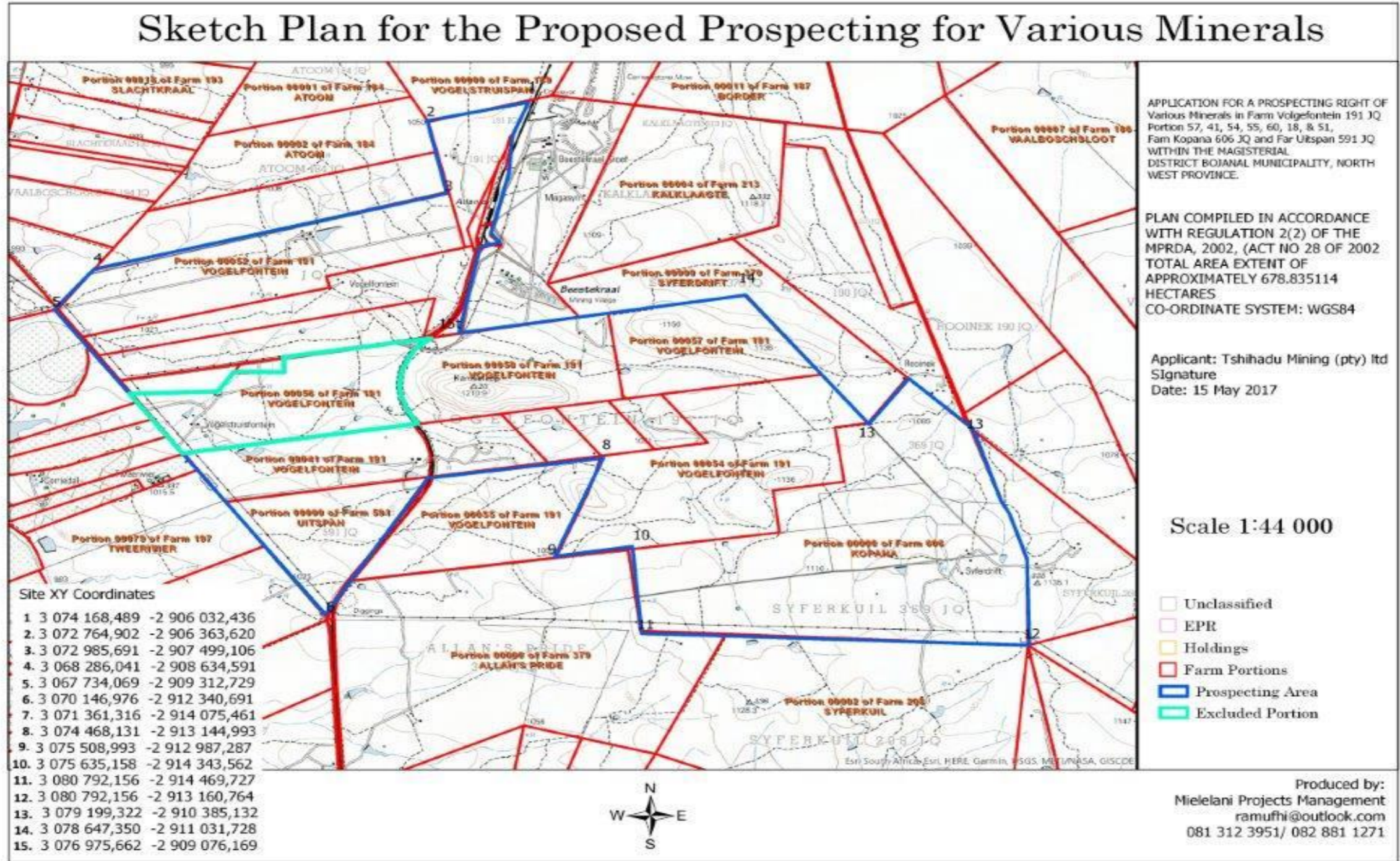
LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT <i>(Mark with an X where applicable)</i>	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
No specialist studies have been undertaken	N/A	N/A	N/A

l) Environmental impact statement

i) Summary of the key findings of the environmental impact assessment;

- The water courses are located on the western boundary of the site, and as such impacts on them can be minimised to be **very low or of no significance**.
- There is a network of existing roads eliminating the need for vegetation clearing to create access roads. With the number of existing roads on site, access road creation impacts can be managed and minimized to be **low**.
- The site is relatively flat, gently sloping to the north, and as such site activities will not enhance erosion on site, where access roads needs to be created, they will be created along the contour than upslope. The erosion impact can easily be managed to be of **no significance**.
- More than 90 percent of the site has been degraded by agricultural and mining activities, and natural vegetation has been cleared. The proposed project will not result in mass clearing of vegetation, as drilling stations will be established on already disturbed areas, and existing roads will be used as far as practicable. The impact significance on the site ecology was therefore considered to be **low**.
- In cases where prospecting activities are undertaken without prior notification to land owners and adjacent occupants, noise nuisance creates major concerns, the land owners as well as the adjacent occupants will be kept informed site activities at all times. The impact significant can be mitigated to be of **no significance**.
- It is expected that cumulative impacts on surface and groundwater quality and biodiversity will be **high** prior to mitigation. Mitigation measures for these potential impacts include: Application of best-practice water management at the drill and camp site, rehabilitation of infrastructure after mine closure and continuous monitoring of surface and groundwater quality.
- The overall impacts significance of the proposed activities after mitigation is considered to be **Medium to Low**.

ii) Final Site Map



Final Site Map

iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

- Increased ambient noise levels resulting from geophysical surveys site flyovers and increased traffic movement during all prospecting phases as well as drilling activities.
- Potential water and soil contamination from hydrocarbon spills from storage tanks and leaks from vehicles and machinery.
- Soil erosion as a result of altered natural storm water flows and flow through cracks and fissures resulting from drilling and tremors resulting from induced vibrations.
- Increased vehicle movement affecting local fauna either through driving over micro animals as well as generation of noise.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunities of crime.
- Visual impacts created by drilling activities.
- Creation of employment opportunities.

m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Impact management objectives are described in terms of the Mitigation Hierarchy of the ERM Impact Assessment Standard. The mitigation hierarchy is as follows:

- **Avoid at Source:** Reduce at Source: avoiding or reducing at source through the design of the Project (e.g., avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).
- **Abate on Site:** add something to the design to abate the impact (e.g., pollution control equipment, traffic controls, perimeter screening and landscaping).
- **Abate at Receptor:** if an impact cannot be abated on-site then control measures can be implemented off-site (e.g., noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals straying onto the site).

- **Repair or Remedy:** some impacts involve unavoidable damage to a resource (e.g. agricultural land and forestry due to creating access, work camps or materials storage areas) and these impacts can be addressed through repair, restoration or reinstatement measures.
- **Compensate in Kind; Compensate Through Other Means:** where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g., planting to replace damaged vegetation, financial compensation for damaged crops or providing community facilities for loss of fisheries access, recreation and amenity space).

Impact management objectives:

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts
- Provide sufficient information and guidance to plan the prospecting activities in a manner that would reduce impacts (both social and Environmental) as far as practicable.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation

Through the implementation of the proposed mitigation measures, it is anticipated that the identified social and environmental impacts can be managed and mitigated effectively. Through the implementation of the mitigation and management measures it is expected that:

- Noise impacts can be managed through consultation and through the restriction of operating hours;
- The pollution of soil and water resources can be effectively managed through waste containment;
- Ecological impact can be managed through the implementation of pollution prevention measures, minimising land clearing, restricting working hours (faunal disturbances) and rehabilitation.
- Concerns regarding access control to the farm can be managed through the development and ensuring compliance to an appropriate access control procedure.

- Risks associated with crime can be mitigated through avoiding recruitment activities on site as well as monitoring and reporting.
- Visual impacts can be minimized through giving consideration to drill site, infrastructure placement and materials used.

n) Aspects for inclusion as conditions of Authorisation

- No activities may take place within 100 m from any river;
- The drilling activities should be restricted to daytime;
- All wastes generated must be disposed of at an appropriate registered landfill and disposal certificate be kept on site.
- Clearing of vegetation should be limited to the working area only.
- The approved EMPr should be kept on site

o) Description of any assumptions, uncertainties and gaps in knowledge

- The depth of water table is unknown at this time and as such areas to be avoided because of shallow water table cannot be pinpointed.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not

It is the opinion of the EAP that the activity be authorised.

- The geological desktop studies have proven that the site is located on a coal reserve, prospecting activities must be undertaken to confirm the presence of the reserve and also to determine the reserve mining feasibility.
- The proposed prospecting activities will have no significant impact on the surface water at the proposed property. There is a large dry area where activities can be undertaken without impacting water sources.
- Major and minor access roads exist within and around the site, and as such there will be no need to clear vegetation to create access roads.

- There are no human occupants within the proposed site which would create relocation concerns.
- There are no known heritage significance artefacts on site
- It has also been noted that mining sector is the pillar of South African economy and also provides employment opportunities for many.
- The option of not approving the activities will result in a significant loss to valuable information regarding the status of the ore bodies present on these properties.
- In addition to this, should economical reserves be present and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost as well.

ii) Conditions that must be included in the authorisation

- An independent and qualified environmental auditor must be appointed to monitor compliance to the conditions of the Authorisation.
- Stream crossings, diversion and ponding is prohibited unless a water use license is obtained from the Department of Water Affairs.
- Stream buffers must be clearly marked as “No-Go” Areas.
- The surface openings must be barricaded at the end of each day.

q) Period for which the Environmental Authorisation is required

The Prospecting Right has been applied for a period of five years. The Environmental Authorisation should therefore allow for the four years of prospecting and one year for decommissioning and rehabilitation.

r) Undertaking

An undertaken by the EAP and the client is provided for in Section 2 of the EMPr.

s) Financial Provision

The site rehabilitation processes will require **R 66 037, 46**. The full rehabilitation cost has been done in Table 9.

(i) Explain how the aforesaid amount was derived.

The aforesaid amount was derived using the department of mineral resource guideline document for the evaluation of the quantum of closure-related financial provision provided by a mine.

(ii) Confirm that this amount can be provided for from operating expenditure

It is confirmed that Duho Mining as the principal proponent will be able to provide for the rehabilitation guarantee purpose (financial Statement attached) as required in terms of section 41 of the MPRDA as read with regulation 53 and 54 of the said Act., will be provided to the DMR upon granting of the requested prospecting right

t) Specific Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). The report must include the: -

1) Impact on the socio-economic conditions of any directly affected person.

No specific report was generated for the purposes of the socio-economic conditions. All findings are presented hereafter:

- Noise due to the undertaking of the site fly-overs and drilling activities;
- Generation of waste that would be injected into the local waste stream;
- Poor access control resulting in impacts on cattle movement breeding and grazing practices;
- Influx of persons (job seekers) to site as a result of increased activity and the possible result ant increase in opportunistic crime; and
- Visual Impact

Table 7: Impact Summary

Potential Impact	Significance Pre-Mitigation	Significance Post-Mitigation
Socio- Economic Environment and Livelihoods		

Creation of Employment opportunities	Low (+)	Low (+)
Loss of Productive land for Agricultural Purposes	Low (-)	Insignificant (-)
Physical and Economic Impacts		
Water and Soil Pollution resulting from spills and leaks of hydrocarbons	Medium (-)	Low (-)
Increased noise levels from the fly-overs planes and drilling activities	High (-)	Medium (-)
Generation of wastes that would be injected into local waste stream	High (-)	Low (-)
Legal and Legacy Issues		
Resentment and anger from unfulfilled expectations	Medium (-)	Low (-)
Influx of job seekers	Medium (-)	Low (-)
Criminal activities (Site Camp invasion)	Medium (-)	Low (-)

2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

There is no known national estate on site, and it is therefore recommended that any Heritage Artefacts that may be encountered should be reported to the SAPS as well as the SAHRA, and activities must cease at that point immediately.

u) Other matters required in terms of sections 24(4) (a) and (b) of the Act.

No alternative site was considered as the DMR has accepted the intention to prospect after all requirements has been met as required by all relevant Legislations.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. Draft environmental management programme.

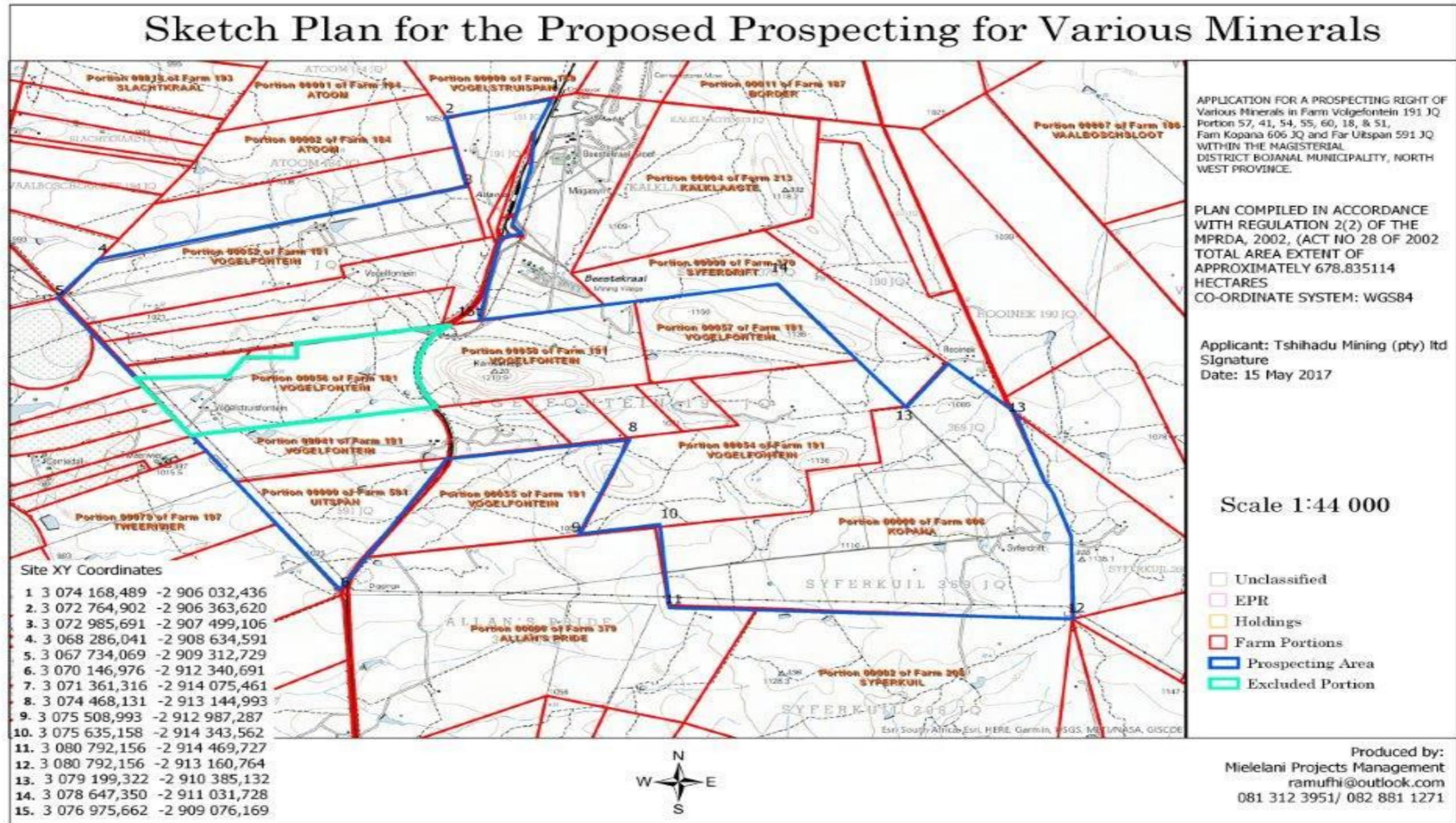
a) Details of the EAP,

The requirement of or the provision of the details and expertise of the EAP are included in PART A, section 1(a).

b) Description of the Aspects of the Activity

The aspects of the activity are fully described in PART A, Section (1) (h) of this document.

c) Composite Map



d) Description of Impact management objectives including management statements

i) Determination of closure objectives

As previously mentioned, each phase of prospecting activities is dependent on the success of the previous phase. The location and extent of soil sampling and drill sites can therefore not be determined at this stage. The closure objectives thus are as follows:

- Eliminate any safety risk associated with drill holes and sumps through adequate drill hole capping and backfilling.
- Remove and / or rehabilitate all pollution and pollution sources such as waste materials and spills;
- Loosen the hardened surfaces which were used as temporary site camp or access roads and re-vegetate with indigenous species.
- Establish rehabilitated area which is not subjected to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources;
- Restore disturbed area and re-vegetate these areas with indigenous vegetation to restore the ecological function of such areas as far as is practicable.

ii) Volumes and rate of water use required for the operation.

The quantities of water to be used are still to be determined however should Tshihadu Mining 2012 (Pty) Ltd use groundwater from any boreholes on the farm it will consultation with the landowner will be done and it should also be noted that excessive water uses would trigger water use license application.

iii) Has a water use licence has been applied for?

A water use licence is not required for this project but should any NWA listings be triggered a water use license will be applied for.

iv) Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

Table 8: Impacts Mitigation

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT									
Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
Desktop Study	Planning	No Impact	None	None	None	None	Protect sensitive site	Locate sensitive and protected	N/A
Geophysical Surveys	Planning	Noise nuisance affecting local schools, hospitals and livestock farming		Noise generation	<ul style="list-style-type: none"> Control Deviation from approved PWP. Control through limiting activities to day time and an open and transparent channel of communication Control of access into the prospecting site. 	<ul style="list-style-type: none"> Notify directly affected parties of the planned date the fly-over activities will be undertaken Access control measures must be agreed 	Remain within the Noise Regulation Standards	Locate sensitive and protected	Throughout Geophysical Survey Phase

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
Site Camp Establishment	Planning	<ul style="list-style-type: none"> Loss of Vegetation during camp site establishment. Soil contamination from chemicals and hydrocarbons spills. Soil Compaction induced by vehicle movement. Water contamination when effluents flow from the site into natural water bodies. Spread of alien vegetation across the proposed site Loss of fauna during site clearing and vehicle movement. Restricted fauna movement by the camp site fences 	Less than 3 ha	<ul style="list-style-type: none"> Loss of Biodiversity Soil Contamination Water Contamination 	<ul style="list-style-type: none"> Control of waste disposal Storm water control Alien vegetation control Monitoring of fauna movement. Rehabilitation of the site at closure Control of sewage handling 	<ul style="list-style-type: none"> Site camp must be demarcated before any activity can be undertaken. Site Camp should be located more than 100 m away from protected sites. Vegetation clearing must be limited to demarcated areas only The site camp must be located more than 100 m away from any surface water bodies. Removed topsoil must be stockpiled for rehabilitation purpose. Search and rescue should be conducted to save fauna Existing access roads must be used as far as possible. Alien vegetation must be given extra care to prevent spread. Site camp must not 	<ul style="list-style-type: none"> Remain within the approved PWP. Identify and Protect sensitive areas. Maintain communication with affected and Interested parties 	<ul style="list-style-type: none"> Identified protected and sensitive areas will be protected. No activity is to be undertaken within 32 metres of any natural rivers. Protected trees will not be removed without permit. 	Throughout the project.

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
Drill site Preparation	Drilling Phase	<ul style="list-style-type: none"> Removal of protected and indigenous trees. Contamination of surface water. Restricted movement of livestock Damage of pipelines Generation of dust Soil contamination from spillages of hydrocarbons Soil compaction through heavy vehicle movement Site littering. Accidents and injuries when heavy trucks slides or sinks on site. Soil erosion where vegetation has been cleared. 	Less than 15 ha	<ul style="list-style-type: none"> Water contamination Soil contamination Air quality deterioration Visual disturbances Health and Safety risks Loss of vegetation Soil erosion Stream sedimentation 	<ul style="list-style-type: none"> Water quality monitoring Control of vegetation clearing Controlling access into the site. 	<ul style="list-style-type: none"> Protected trees must be marked Hydrocarbons Spills must be attended to as soon as they occur. Removed topsoil must be stockpiled for rehabilitation purpose. Consultation with local farmers to communicate barricaded areas preventing cattle grazing. Buried pipelines positions must be clearly marked on the sensitivity map. Vehicle movement should be restricted to approved access roads. The transported load must be safely 	<ul style="list-style-type: none"> Remain within the approved Prospecting Work programme. Protect sensitive areas Prevent contamination of environmental elements. Creates risk and hazards free environment 	<ul style="list-style-type: none"> Protected areas will be clearly marked on a sensitivity map Health and Safety standards will be maintained Spillage kit control will be available on site 	Throughout the drilling preparation phase.

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
						secured to prevent accidental load falls. • Waste bins must be provided and clearly marked to promote waste separation. • Appropriate dust suppression method should be applied. • Storm water channels must be directed away from erosion prone areas • Waste water must be contained onsite, treated and released.			
Drilling activities	Drilling phase	<ul style="list-style-type: none"> • Ground water contamination when aquifers are disturbed • Liquid waste flowing down the hole contaminating ground water • Soil contamination from drilling effluents 	Less than 20 ha	<ul style="list-style-type: none"> • Water contamination. • Air Pollution • Stream sedimentation • Increased surface flows. • Health and Safety risks. 	<ul style="list-style-type: none"> • Controlling of access to the site • Controlling flow of storm water • Controlling dust generation • Rehabilitation of the site • Monitoring of 	<ul style="list-style-type: none"> • Geophysical methods should be used to detect positions of aquifers to avoid ground water contamination. • The drill bits and equipment must be in good working 	<ul style="list-style-type: none"> • Remain within the Prospecting Work Programme. • Protect sensitive areas • Maintain consultation with land owners • Prevent 	<ul style="list-style-type: none"> • Protected trees will be marked by tapes • Sensitive areas will be clearly marked on a scaled map • Storm water 	The mitigation will be implemented before the commencement of drilling activities and be continuous thereafter.

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
		<ul style="list-style-type: none"> • Generation of muddy flows that may contaminate surface waters • Generation of dust from drilling activities and ground disturbances • Noise nuisance from drilling equipment. • Hardening of surfaces when the mud from the drilling site dries up. • Loss of soil fertility as topsoil gets covered up by mud from the drilling site. • Wild animals and livestock may be trapped by the mud. • Disruption of essential services such as access roads when covered by the mud from the drilling site. 			water quality	<p>condition to prevent leakages of hydrocarbons.</p> <ul style="list-style-type: none"> • The drill holes must be capped when not in use to prevent debris flow of wastes and topsoil • The drill holes must also be capped to eliminate health hazards. • Access by wild animals and livestock into the site must be limited through barrications. • The drill site must be regularly watered to prevent dust generation. • There should be a periodic checking of the site's drainage system to ensure that the water flow is 	<p>contamination of natural elements</p> <ul style="list-style-type: none"> • Eliminates health hazards 	<p>control channels will be developed</p> <ul style="list-style-type: none"> • Waste management strategies will be implemented • An open register for interested and affected parties will be maintained • Noise will be limited within accepted threshold. • Drilling activities will be conducted within demarcated areas only. 	

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
		<ul style="list-style-type: none"> • Poor housekeeping resulting in littering which could lead to river contamination and health hazards to livestock. • Health and safety hazards to humans, livestock and wild animals. 				<p>unobstructed.</p> <ul style="list-style-type: none"> • Drilling activities should be conducted during day time to avoid noise during late hours. • Storm water channels must be developed which drains water away from erosion prone areas. • The muddy water from the drilling activities must be contained on site. • Where muddy water has flown over access roads, the mud must be scrapped to prevent slippery road conditions. • The flow of muddy water should not be allowed to enter 			

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
						<p>agricultural land as it will affect soil fertility.</p> <ul style="list-style-type: none"> • Use existing track and roads in all instances as far as is practicable. • A waste management system should be implemented and sufficient waste bins be provided onsite. A fine system will be implemented to further prohibit littering and poor housekeeping practices. 			
Chemical and Fuel storage	Drilling activities	<ul style="list-style-type: none"> • Spillages and leaks contaminating water and soil. • Spread of pathogens affecting both humans and livestock. • Improper sewage removal methods 	Less than 1 ha	<ul style="list-style-type: none"> • Soil Contamination • Water contamination • Health and Safety risks 	<ul style="list-style-type: none"> • Control chemical storage • Control chemical spillages and leaks 	<ul style="list-style-type: none"> • The fuel stored on site should be placed on a raised bunded wall • The chemical toilets must be emptied regularly by a certified company. 	<ul style="list-style-type: none"> • Protect water resources • Create a health hazard free environment. 	Fuel and chemicals will be stored according to storage specifications	During drilling activities.

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
		resulting in contamination of soil and water.				<ul style="list-style-type: none"> • All hazardous wastes must be disposed of at an appropriate landfill and a certificate of disposal must be filed on site. • All general wastes must be disposed of at a registered general waste landfill site and disposal certificate must be filed on site. • All chemical storage containers must be clearly marked and material handling sheet be provided. • The chemicals should be stored in sealed containers on a bunded surface. • Appropriate Personal Protective Equipment must be 			

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
						<p>provided to staff working with hazardous chemicals.</p> <ul style="list-style-type: none"> • Spillages must be attended to as soon as they occur. • Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. • The HSE must determine the precise method of treatment of polluted soil. • Contaminated materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to 			

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
						the environment, and stored in adequate containers until appropriate disposal or collection.			
Transporting equipment out of site	Closure Phase	<ul style="list-style-type: none"> • Soil compaction during movement of heavy trucks. • Oil and fuel leaks from heavy trucks transporting drilling equipment. • Water contamination from water flowing from contaminated site. • Loss of soil fertility. • Health hazards during loading of the equipment on transporting trucks. • Road accidents with other motorists, or hitting livestock on the access road. 	Less than 5 ha	<ul style="list-style-type: none"> • Health and Safety Hazards • Soil Compaction • Water Contamination • Air Pollution • Control traffic movement • Site rehabilitation. 	<ul style="list-style-type: none"> • Site rehabilitation • Pollution Control • Traffic movement control • Monitoring of implemented control strategies 	<ul style="list-style-type: none"> • Vehicle movement should be properly planned and communicated with other road users. • Local farmers must be alerted of trucks movement • The dusty roads must be watered prior movement of heavy trucks. • Existing access roads must be used. • Where large trucks have to pass across a river, it should be ensured that they have no leaks that could potentially 	<ul style="list-style-type: none"> • Remain within prospecting work programme. • Remain within noise control standards. • Remain within pollution control standards 	<ul style="list-style-type: none"> • The prospecting work will be completed within a specified period of 5 years. • Pollution control measures will be implemented • Consultation with affected parties and land owners will remain continuous. 	During site closure when equipment are shipped out of site.

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT

Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
		<ul style="list-style-type: none"> Noise nuisance from the movement of heavy trucks 				contaminate the water.			
Decommissioning of camp site	Site Closure	<ul style="list-style-type: none"> Contamination of stockpiles. Generation of wastes from old and worn out equipment and also empty containers. Noise nuisance from demolition activities. Dust Pollution from demolition activities. Debris flow of general wastes into natural water drainages. Health and safety hazards 	Less than 1,5 ha	<ul style="list-style-type: none"> Water contamination Air pollution Noise pollution Health and Safety Hazards 	<ul style="list-style-type: none"> General wastes must be collected and stored separately for disposal at a registered landfill. Workers should wear protective clothing when performing demolition activities. Where possible surfaces should be watered to prevent dust prevention. Demolition activities should be communicated with directly affected parties to alert them of noisy activities. All equipment should be shipped out of site. The temporary 	<ul style="list-style-type: none"> Control of waste handling Consultation with affected parties Rehabilitation of affected land 	<ul style="list-style-type: none"> Ensure that the site is restored to its original state as far as practicable. Remain within noise control standards Remain with pollution control standards 	<ul style="list-style-type: none"> Measures will be taken to inform affected parties of noisy activities to be undertaken. The site will be restored to its original state as far as practicable. 	Throughout Closure Phase

IMPACT ASSESSMENT FOR Tshihadu MINING 2012 (PTY) LTD PROSPECTING PROJECT									
Activities	Phase	Potential Impact	Size and Scale of Disturbance	Aspects Affected	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					structures must be demolished and resulting wastes be removed from site.				

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph)

ACTIVITY (Whether listed or not listed).	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Impact management outcomes have been addressed in Table 8 above					

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY (whether listed or not listed)	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Impact management Actions have been addressed in Table 8 above				

(i) Financial Provision

1. Determination of the amount of Financial Provision

a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

Prospecting activities are to be undertaken in a manner which facilitates site rehabilitation and the restoration of existing land capabilities. The primary objectives for rehabilitation include:

- a) The facilitation of the re-establishment of the land use and capability to as close as reasonable to the original conditions.
- b) Removal of all infrastructure and material introduced to site,
- c) Removal of all wastes and their disposal at an appropriate registered waste facility
- d) Promotion of rapid re-establishment of the natural vegetation and the restoration of the site ecology.

The disturbed areas shall be rehabilitated to ensure that:

- ✓ The biodiversity habitat encourages the new land use after the prospecting
- ✓ Eliminate any safety risk associated with drill holes and sumps through adequate drill hole capping and backfilling.
- ✓ Environment and resources are not subjected to physical and chemical deterioration,
- ✓ The site is reversed to almost its original state
- ✓ The after-use of the site is beneficial and sustainable in a long term
- ✓ All socio-economic benefits are maximized

The rehabilitation plan shall entail removal of all generated wastes, infrastructure and materials, re-vegetation of disturbed and cleared areas, rehabilitation of access roads, ensuring the growth of the existing grasses and plants species and cleaning of spillages.

b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

This Basic Assessment Report and Environmental Management Plan was made available to each registered stakeholder for review and comment over a 30 days' period running from 21 July 2017 to 20 August 2017. All comments were captured in the issues and response section and have been incorporated into the final report.

c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

As previously mentioned, each phase of the prospecting activities is dependent on the success of the previous. Depending on the outcome of the Phase 1 assessment and airborne/ ground geophysics survey programme will be initiated. Targets that have been prioritized through detailed anomaly will be tested by initial drilling.

The location and extent of drill sites can therefore not be determined at this stage. Mapping of the prospecting activities could thus not be undertaken. Due to the nature of the activities, the impacts will be very limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. The areas for drilling purposes will be the main area experiencing impacts. In this event the activities will be temporary in nature, and a detailed management plan has been provided to address potential impacts associated with these activities. The only rehabilitation that will specifically be required is borehole capping and re-vegetation:

- **Borehole capping**

Drill holes must be permanently capped as soon as is practicable. Figure 19 below provides the prepared procedure to secure plugging of exploration drill holes.

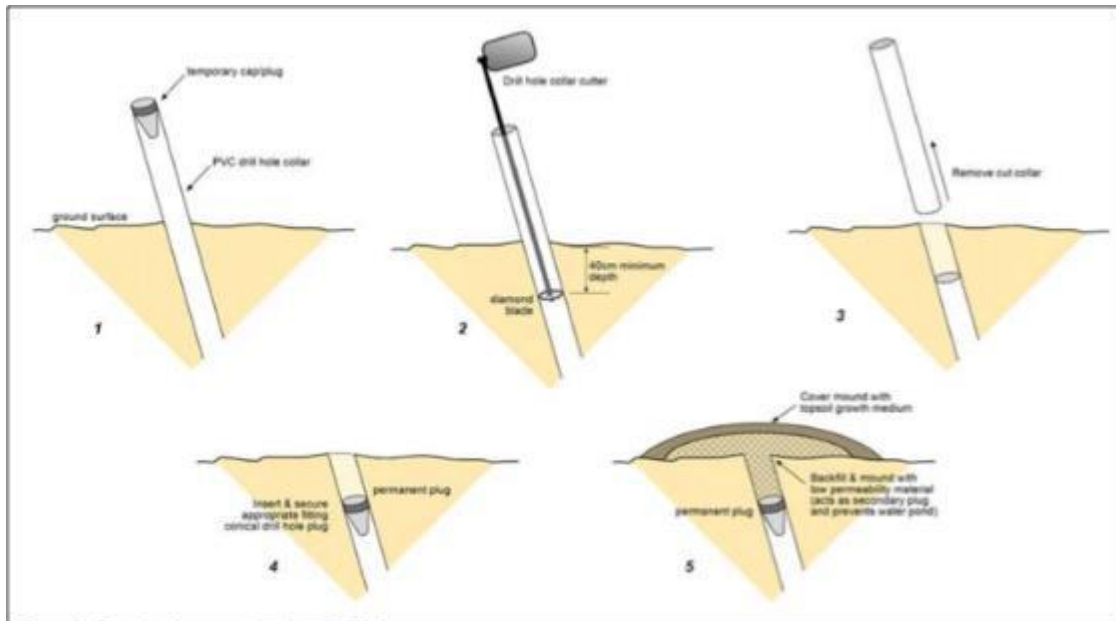


Figure 1-1: Capping of Boreholes

- **Re-vegetation**

It is recommended that a standard commercial fertilizer high in the standard elements is added to the soil before re-vegetation, at a rate of 10 -20k g/ha (application rate to be confirmed based on input from a suitably qualified specialist). The fertilizer should be added to the soil in a slow release granular form. A suitably qualified ecologist will be appointed to determine the appropriate veld grass mix for hand seeding.

Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. An effective vegetation cover of 45% must be achieved. Re-seeding will be undertaken if this cover has not been achieved after six months.

d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The primary objective of the rehabilitation plan is to restore the site to its previous state before the prospecting activities were undertaken. The rehabilitation plan has been developed such that all the project closure objectives can be realized. The rehabilitation plan will ensure that all the site disturbances are resolved, temporary infrastructures are removed and the site meet the required standard of the prospecting activities hereafter proposed land use.

e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

Table 9: Quantum Calculation

CALCULATION OF THE QUANTUM - PROSPECTING ACTIVITIES							
Applicant:	Tshihadu Mining (PTY) LTD			Location:	Pretoria		
Evaluator:	Mutshenzhe (Pty) Ltd			Date:	07 July 2017		
No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m3	0	6,82	1	1,2	-
2 (A)	Demolition of steel buildings and structures	m2	0	95,00	1	1,2	-
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	140,00	1	1,2	-
3	Rehabilitation of access roads	m2	160	17,00	1	1,2	3 264,00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	165,00	1	1,2	-
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m	0	90,00	1	1,2	-
5	Demolition of housing and/or administration facilities	m2	0	190,00	1	1,2	-
6	Opencast rehabilitation including final voids and ramps	ha	0	96 700,00	0,52	1,2	-
7	Sealing of shafts adits and inclines	m3	0	51,00	1	1,2	-
8 (A)	Rehabilitation of overburden and spoils	ha	0,12	66 400,00	1	1,2	9 561,60
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	82 700,00	1	1,2	-
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	240 200,00	0,76	1,2	-
9	Rehabilitation of subsided areas	ha	0	55 600,00	1	1,2	-
10 (A)	General surface rehabilitation (with undesirable objects)	ha	0	52 600,00	1	1,2	-
10 (B)	General surface rehabilitation (no undesirable objects)	ha	0,5	36 890,00	1	1,2	22 134,00
11	River diversions	ha	0	52 600,00	1	1,2	-
12	Fencing	m	60	60,00	1	1,2	4 320,00
13	Water management	ha	0,4	20 000,00	0,6	1,2	5 760,00
14	2 to 3 years of maintenance and aftercare	ha	3	700,00	1	1,2	2 520,00
15 (A)	Specialist study	Sum	0	-		1,2	-
15 (B)	Specialist study	Sum	0	0		1,2	-
					SUM		47 559,60
	Multiply Sum * of 1 – 15 by Weighting factor 2			Weighting factor 2 1,05		Subtotal 1	49 937,58
1	Preliminary and General			Add 6% of Subtotal 1 if Subtotal 1 R100,000,000.00			2 996,25
2	Contingencies			Add 10% of Subtotal 1			4 993,76
				Preliminary and General + Contingencies			Sub Total 2 7 990,01
				Subtotal 1 + Sub Total 2			Sub Total 3 57 927,59
				VAT @ 14 % of Subtotal 3			8 109,86
				GRAND TOTAL			66 037,46

f) Confirm that the financial provision will be provided as determined.

It is confirmed that Mutshenzhe Mining as the principal proponent will be able to provide for the rehabilitation guarantee purpose (financial Statement attached) as required in terms of section 41 of the MPRDA as read with regulation 53 and 54 of the said Act., will be provided to the DMR upon granting of the requested prospecting right.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

b) Monitoring of Impact Management Actions

Refer to Table 10

c) Monitoring and reporting frequency

Refer to Table 11

i) Responsible persons

Refer to Table 11

j) Time period for implementing impact management actions

Refer to Table 11

k) Mechanism for monitoring compliance

Table 10: Compliance Monitoring and Frequency

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
Data Acquisition and Desktop Study	None identified	None	N/A	N/A
Target generation and ground truthing	Noise impacts resulting from site fly-over affecting local service centres and also affecting livestock.	Landowners and directly affected parties will be informed of the planned dates of the airborne survey and grievance mechanism will be made available.	Prospecting Manager	Once-off upfront consultation with affected parties. As required as grievances are received.
Ground Geophysical surveys and Soil Sampling	Access into private properties	As soon as the extent of site activities are known. These must be communicated with directly affected landowners. The following procedures must be developed in conjunction with	Prospecting Manager	✓ As soon as the extent of site activities are known, confirmation of the extent of site activities must be sent to Department of Mineral Resource before such

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
		<p>these landowners:</p> <ul style="list-style-type: none"> ✓ Emergency Preparedness and Response Plan; and ✓ Access control procedures and requirements. 		<p>activities can be undertaken.</p> <ul style="list-style-type: none"> ✓ Proof of consultation with directly affected landowners and the outcome of such consultation to be submitted to the Department of Mineral Resources. ✓ Continuous monitoring of compliance with the access control procedure will be under taken.
Exploratory Drilling	Visual inspection of soil erosion and / or compaction	All exposed areas, access roads, the drill pad and soil stockpiles must be monitored for erosion on a regular basis and specifically after rain events.	Prospecting Manager Contractor	Weekly and after rain events
Exploratory Drilling	Dust generated will be assessed through	If dust outfall is excessive and regarded to affect any sensitive	Contractor	✓ Monthly monitoring reports to be signed-off by the

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
	visual observation	receptors a monitoring programme must be initiated based on the input of a suitably qualified air quality specialist.		<p>Environmental Manager.</p> <ul style="list-style-type: none"> ✓ Corrective action to be confirmed and signed-off by the Environmental Manager. ✓ Consolidated monthly monitoring reports (including the corrective action taken) to be submitted to the Department of Mineral Resources.
Exploratory Drilling	Visual inspection of biodiversity impacts and the occurrence of invader species	Visual inspection of clearing activities and other possible secondary impact on biodiversity will be undertaken. The introduction of alien invasive vegetation species will be monitored.	Prospecting Manager Contractor	<ul style="list-style-type: none"> ✓ Once-off during clearing activities ✓ Weekly inspection of secondary impacts <ol style="list-style-type: none"> 1. Monthly monitoring reports to be signed-off by the Environmental Manager. 2. Corrective action to be

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
				<p>confirmed and signed-off by the Environmental Manager.</p> <p>3. Consolidated monthly monitoring reports (including the corrective action taken) to be submitted to the Department of Mineral Resources.</p>
Exploratory Drilling	Visual inspection of pollution incidents, the integrity of secondary containment structures and waste management	<ul style="list-style-type: none"> ✓ All secondary containment structure will be inspected on a regular basis to confirm the integrity thereof and to identify potential leaks. ✓ All spill incidents will be identified and corrective action taken in accordance with an established spill response 	Prospecting Manager Contractor	<ul style="list-style-type: none"> ✓ Monthly monitoring reports to be signed-off by the Environmental Manager. ✓ Corrective action to be confirmed and signed-off by the Environmental Manager. ✓ Consolidated monthly monitoring reports (including the corrective action taken) to

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
		<p>procedure.</p> <ul style="list-style-type: none"> ✓ Waste management practices will be monitored to prevent contamination and littering. 		<p>be submitted to the Department of Mineral Resources.</p> <ul style="list-style-type: none"> ✓ Incident reporting will be under taken as required in terms of the relevant legislation including, but not limited to, the: <ul style="list-style-type: none"> a) Mineral and Petroleum Resources Development Act 28 of 2002; and b) National Water Act 36 of 1998.
Post Closure Monitoring	Follow up inspections and monitoring of rehabilitation	<ul style="list-style-type: none"> ✓ Inspection of all rehabilitated areas to assess whether any soil erosion is occurring and implement corrective action where required. ✓ Confirm that the set target 	Prospecting Manager	<p>Monthly for a period of 6 months after rehabilitation activities are concluded.</p> <ul style="list-style-type: none"> ✓ Monthly monitoring reports to be signed-off by the

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
		<p>cover for all re-vegetated areas have been achieved after a period of 6 months and re-seed where required.</p> <p>✓ Identify any areas of subsidence around drill holes and undertake additional backfilling if required</p>		<p>Environmental Manager.</p> <p>✓ Corrective action to be confirmed and signed-off by the Environmental Manager.</p> <p>✓ Consolidated monthly monitoring reports (including the corrective action taken) to be submitted to the Department of Mineral Resources.</p> <p>✓ Final impact and risk assessment report for site closure to be submitted to the Department of Mineral Resources for approval.</p>

l) Indicate the frequency of the submission of the performance assessment/environmental audit report.

Annual performance assessments must be undertaken on the EMPr. These reports must also include the assessment of the financial provision. The reports should be submitted to the DMR.

m) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work

Objective

To inform all parties involved in the prospecting activities of their environmental management responsibilities and to monitor their performance in terms of those responsibilities.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment

The following steps will be undertaken to ensure that risks are identified at the earliest and ensure that they are avoided:

a) Delegation of a Project Environmental Officer

An Environmental Officer (EO) must be appointed before any activity can be undertaken on site. The officer must be a qualified environmental Practitioner.

b) Notice of Commencement

North West Department of Mineral Resource must be notified in writing 2 weeks before the prospecting activities are undertaken.

c) Contractor Environmental Documents

Prior to commencement of work on site, the EO is to provide copies of the following documents to each Contractor appointed to undertake activities on site:

- The Environmental Authorisation
- The final approved Environmental Management Programme (EMPr).
- Requirements of the Contractor in terms of management of the following aspects during construction:
 - i. Storm water, wastewater, effluent and sewage;

- ii. Atmospheric emissions and noise;
- iii. Storage and handling of hazardous substances;
- iv. Spill management;
- v. Waste management, including contaminated soil;
- vi. Water conservation
- vii. Accessible and no-go areas on site;
- viii. Complaints and environmental incident procedures;
- ix. Method Statements

d) Environmental Monitoring

The EO is to undertake monthly internal environmental compliance audits and prepare monthly environmental audit reports during the construction period. The internal environmental audit reports are to contain the following information:

- 1) An assessment of the Contractor's compliance with:
 - (i) the relevant conditions of the Environmental Authorisation
 - (ii) the approved Environmental Management Programme
 - (iii) the approved Construction Site Plan
 - (iv) the approved Construction Method Statements.
- 2) Provide feedback on:
 - (i) environmental training undertaken
 - (ii) any environmental incidents or complaints
 - (iii) waste type quantities recycled and disposed
 - (iv) any environmental issues identified
 - (v) the results of any environmental investigations
 - (vi) actions undertaken from previous audits.
- 3) Recommended actions to be undertaken.

e) Environmental Training

Prior to working on site, every person that will be undertaking any retrofit activities must receive training on the relevant environmental management requirements. The EO is to ensure that the environmental training includes the relevant requirements from:

- The Environmental Authorisation.
- The final approved Environmental Management Programme.

Aspects to cover during induction and Environmental Awareness Training:

- Description of the components and phases of the operation
- Description of Environmental Impacts
 - ✓ What is an Environmental impact?
 - ✓ Types of Environmental Impacts
 - ✓ Causes of environmental impacts
- Description of Environmental Impacts Mitigation

A full Environmental Awareness Plan is attached as **Appendix 2**

(3) Specific information required by the Competent Authority

No specific information was required by the Competent Authority.

2. UNDERTAKING

The EAP herewith confirms

- a. the correctness of the information provided in the reports
- b. the inclusion of comments and inputs from stakeholders and I&APs;
- c. the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d. that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.

Signature of the environmental assessment practitioner:

Name of company:

10 July 2017

Date:

-END-

Appendix 1: EAP CV

Appendix 2: Environmental Awareness Plan

1. Introduction

Legislation requires that an prospecting/Prospecting company who prepares an environmental management program must develop an environmental awareness plan describing the manner in which the company intends to inform his or her employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

1.1. The Environmental Awareness Plan (EAP)

The EAP forms part of the EMPr and is intended to create the required awareness and culture with personnel and contractors/service providers on environmental safety and health issues associated with the prospecting activities.

1.2. The applicant's policy on environmental awareness

This Environmental Awareness Plan (EAP) will serve as the basis for the induction of all new employees (as well as contractors pending the nature of their work on site) on matters as described herein and read in conjunction with the EMPr. The Plan will also be used to hone awareness of all employees on a continuous basis. Specific environmental awareness performance criteria will also form part of the job descriptions of employees, to ensure diligence and full responsibility at all levels of the organisational work force.

1.3. Fostering environmental awareness

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensure that environmental accidents are minimized and environmental compliance maximized.

Environmental awareness will be fostered in the following manner:

- a) Induction course for all workers on site, before commencing work on site.
- b) Refresher courses as and when required
- c) Daily toolbox talks at the start of each day with all workers coming on site, where workers can be alerted to particular environmental concerns associated with their tasks for that day or the area/habitat in which they are working.
- d) Taking part in national and international environmental campaigns like National Marine Week, National harbour day, National Wetlands day exacta.

- e) Displaying of information posters and other environmental awareness material in the general assembly points.

1.4. Training and environmental awareness

The company accepts that environmental awareness training is critical for the workforce to understand how they can play a role in achieving the objectives specified in the EMPr and ensure that the actions specified in the EMPr are implemented effectively and efficiently. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard.

2. The environmental awareness training course

All employees should attend the course, regardless of position, status or level of responsibility. With a background of basic environmental awareness and an understanding of basic environmental issues and sensitivities, personnel may be motivated and empowered to do their share in helping to maintain the integrity of the environment on the prospecting site through environmental impact management.

The goal of this course is therefore to enable a shared understanding and common vision of the environment, the impact of a prospecting operation on the environment (and why this is important) and the role of prospecting personnel in terms of environmental management and compliance.

The induction course will compose of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it.
- The second step will be a description of the components and phases of the specific Prospecting operation.
- The third step will be a general account of how the Prospecting operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts.
- The fourth and most important step will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.

3. Course content

The following can be seen as draft course content as it will be building on as specific needs arrases and will be supplemented with the handout of reading material and extracts of the EMPr on which the course will be based.

3.1. The environment

The environment consists essentially of the living environment, the non-living environment and the man-made environment. The living environment consists of our plant and animal resources. The non-living environment includes the soil, water and geological resources. The man-made environment comprises our infrastructure, social, cultural and archaeological resources.

These environments depend on one another, and man depends on them all for his survival. Damage to one will be felt by so we must fry to protect the as well as their interactions with one another as they occur in nature.

When undertaking a Prospecting operation or any other form of development this concept must be kept in mind. Development must be implemented in such a way that we benefit today without compromising the ability of future generations to benefit as well. Employees should understand this concept of sustainability and sustainable development.

3.2. Description of the components and phases of the operation

The project description should be explained as part of induction together with the main components or activities that can affect the environment, giving rise to what we call environmental impacts. The Prospecting operation consists of a number of different components

3.3. Description of Environmental Impacts

A general account of how the Prospecting operation and associated activities can affect the environment must be explained. This is basically a description of concept of environmental impacts.

a) What is an Environmental Impact?

An environmental impact is the result, either good or bad, of man's actions on the natural environment these results in one or many changes in the environment may also affect the availability of resources and the environment's capacity to function.

Impacts can occur either as a result of:

- The use of a resource;

- Or the pollution of a resource.

In addition, impacts can be categorised as the following:

- Foreseen, such as the necessary clearing of the vegetation before Prospecting begins, or Unforeseen, such as the flooding of an area following heavy rains;
- **Avoidable**, such as the unnecessary spillage of diesel during refuelling- or **Unavoidable**, such as the disturbance created during drilling; **Simple**- such as litter untidying the prospecting site, or **Cumulative** which is a collective impact from different existing activities.

a) Environmental Impacts

Typical environmental impacts anticipated on a Prospecting site include the following:

The loss of plants; The loss of animals; Soil pollution; Dust liberation; Soil compaction and erosion; and Water pollution;

b) Causes of environmental impacts

These environmental are caused primarily by inadequate planning & not adhering to the EMPr Specifications'.

- The inadequate planning & preparation of the Prospecting site;
- The uncontrolled expansion of the Prospecting site footprint;
- The uncontrolled activity of Prospecting staff;
- The injudicious removal / disturbance of vegetation and habitat;
- The unnecessary loss of soil;
- Uncontrolled vehicular movement & circulation;
- The haphazard storage of vehicles, equipment and material;
- The uncontrolled servicing, repair and refuelling of vehicles;
- Unclear policy on solid waste management;
- Unclear policy on waste water;
- The uninformed use, storage and disposal of hazardous material;
- The erosive power of storm water and runoff;
- Unintentional fires;

3.4. Description of Environmental Impacts Mitigation

The fourth and most important step of an induction course will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading their environment. This is known as Environmental Impact Management and is also described in the Environmental Management Programme. The course discussion should also include general environmental code of conduct practices such as:

Impact management: Prospecting site establishment (general):

- Do not cross any site fences;
- Do not walk, drive or store material in rehabilitating areas;
- Report any access into fenced off areas to the foreman environmental manager;
- Use only areas designated for certain construction activities;
- Do not access any stream or water body without permission;
- Report any headstones, graves or human remains you may find to the foreman environmental manager;

Impact management: Construction phase (general):

- Only eat, cook, sleep and recreate in the areas designated on site;
- Do not bathe anywhere except in the designated areas on site;
- Always use the toilet facilities provided;
- Only use the water provided on site- do not collect water from or dispose water into a natural water course;
- Always make use of the specified Prospecting site safety measures;
- Do not hunt, kill or injure any animals anywhere on site;
- Inform the foreman environmental of any dangerous or problem
- Do not leave any food or rubbish where scavengers can get at it. Impact management: Health and safety (general):
- Always use the toilet & hand washing facilities provided.
- Only use the water provided on site - do not collect water from or dispose water into a natural water course.
- Make use of the specified protective gear for noisy and dusty conditions.
- Always wear proper protective head and foot gear while on site.
- Know where to find a list of emergency numbers in the event of one.
- Report accidents, injuries and unsafe site conditions to the Safety Officer.

Impact management: Vegetation clearing (general):

- Do not damage, destroy or remove any significant tree that has been marked;
- No firewood may be harvested without permission;
- Newly planted trees may not be disturbed in any way;
- Do not excavate beneath the crown of any tree that has been marked;
- No conserved tree may be used to support or hang anything in;
- Report to the foreman environmental manager any damage to any significant tree that has been marked.

Impact management: Top Soil removal and storage (general):

- Only excavate soil, gravel, rock etc. from designated areas;
- Stockpile soil only as instructed and at the time it is instructed;
- Do not make new stockpiles without permission;
- Do not use soil or remove soil from any stockpile without permission;
- Do not walk, drive or store any equipment, machinery or material on any stockpile.

Impact management: Access and transport (general):

- Only drive on designated roads and tracks;
- Move obstacles out of the way rather than drive around them;
- Only cross drainage lines at designated points;
- Always drive within the specified speed limit.

Impact management: Storage of vehicles, equipment and material (general):

- Do not leave machinery and equipment standing around if not in use;
- Only park vehicles in designated areas;
- Do not park heavy vehicles or store equipment under or near trees
- Do not store machinery, vehicles or materials in undisturbed or rehabilitating areas.

Impact management Servicing, repair and refuelling of vehicles (general):

- Only service machinery and vehicles in designated areas;
- Regularly check your vehicle for fuel and oil leaks;
- Inform the foreman environmental manager of leaking vehicles and machinery so that he can schedule repairs;
- Only refuel by means of a pump and on the bund created for that purpose;
- Immediately clean any accidental fuel and oil spills - do not hose spills into the natural environment;
- Dispose of contaminated soil as hazardous waste in the correct location on site.

Impact management: Solid waste management (general):

- Do not litter - make use of refuse bins provided;
- Concrete may only be mixed in designated areas and not directly on the ground;
- Do not hose spills into the natural environment - inform the foreman environmental manager of spills you are unable to clean yourself;
- Dispose of construction rubble only in specified storage areas - if in doubt, ask;
- Do not bury, hide or burn any waste of any nature;
- Inform the foreman of any illegal litter or dumping site that you encounter.
- Impact management: Waste water management (general):
- Do not use any natural water course to wash machinery, vehicles or equipment;
- Only wash machinery, vehicles or equipment in designated areas;
- Conserve water and report any leaks and overflow to the foreman,

Impact management: Management of hazardous material (General):

- Make sure that you know how to handle all hazardous substances;
- Do not access stores for hazardous substances without permission;
- Immediately clean any minor accidental spills and leaks;
- Do not hose any leaks or spills into the natural environment;
- Dispose of all hazardous waste in specified storage areas - if in doubt, ask;
- Immediately report any major leaks and spills to the foreman environmental manager.

Impact management: Fire management (General)

- Do not make open fires except in permitted areas and at permitted times;
- Do not leave any fires unattended. Extinguish these before you leave the area;
- All cooking is to be done on gas / electric stoves and only in the areas provided;
- Ensure that you know where firefighting equipment is located.

Appendix 3: Public Participation Report