BASIC ASSESSMENT REPORT

AND

ENVIRONMEMTAL MANAGEMENT PROGRAMME REPORT

PROSPECTING RIGHT AND ENVIRONMENTAL AUTHORISATION APPLICATION FOR CHROME ORE, COPPER ORE, ANDALUSITE, IRON ORE AND SILLIMANITE RESOURCES ON THE FARM HOOGGENOEG 293 KS WITHIN THE LEPELLE-NKUMPI MAGISTERIAL DISTRICT, LIMPOPO PROVINCE

DMRE REF: LP 30/5/1/1/2/13799 PR

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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).

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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 in instructions or guidance provided by the Competent Authority to the submission of applications.

It is therefore the instruction that the prescribed reports required in respect of application 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 requested 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 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 activity is located and document how the proposed 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 the 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.

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LIST OF ABBREVIATIONS

BAR	**: Basic Assessment Report**
BID	**: Background Information Document**
DMRE	**: Department of Mineral Resources and Energy**
DWS	**: Department of Water and Sanitation**
EA	**: Environmental Authorisation**
EAP	**: Environmental Assessment Practitioner**
EIA	**: Environmental Impact Assessment**
EIMS	**: Environmental Impact Management Services**
EMPr	**: Environmental Management Programme Report**
GIS	**: Geographic Information System**
I&AP	**: Interest and Affected Party**
MPRDA	**: Mineral and Petroleum Resources Development Act**
NEMA	**: National Environmental Management Act**
NEMWA	**: National Environmental Management Waste Act**
NWA	**: National Water Act**
PPP	**: Public Participation Process**
PRA	**: Prospecting Right Application**
PWP	**: Prospecting Works Programme**

PART A:

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. INTRODUCTION

DC Ore Minerals and Energy (the Applicant) has submitted an application for a Prospecting Right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and an Application for Environmental Authorization in terms of Chapter 6 of GNR 982 promulgated under the National Environmental Management Act (Act 107 of 1998) (NEMA) to prospect for Chrome ore, Copper ore, Andalusite, Iron ore and Sillimanite resources.

The proposed project will aim to ascertain if economically viable mineral deposits exist within the application area. In order to undertake prospecting activities, DC Ore Minerals and Energy will require a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act (MPRDA, Act No.28 of 2002). The Applicant is also required to obtain an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998) which involves the submission of a Basic Assessment Report (BAR). Singo Consulting (Pty) Ltd has been appointed by DC Ore Minerals and Energy to compile the BAR (this report) in support of the Prospecting Right application submitted by DC Ore Minerals and Energy, which in turn will be submitted to the DMRE for adjudication.

This BAR has been designed to meet the requirements for a BAR and Environmental Management Programme report (EMPr) as stipulated in the 2014 EIA Regulations promulgated under the NEMA. The adjudicating authority for this Application will be the Department of Mineral Resources and Energy (DMRE), and this report has been compiled in accordance with the applicable DMRE guidelines and reporting template.

The proposed Prospecting Right Area is situated over the farm Hooggenoeg and is located approximately 15.69 km North East of Bogalatladi and approximately 5.57 km North West of Tubex within the Lepelle-Nkumpi Local Municipality.

A Prospecting Work Programme (PWP) has been developed by the applicant to include both non-invasive and invasive prospecting activities. The target geological formation of the PWP is the Bushveld Complex.

The Prospecting Right Application and Application for EA was submitted to the DMRE. The DMRE accepted the proposed application on the 27th of August 2020.

1.1. DETAILS OF THE EAP

Singo Consulting (Pty) Ltd was appointed by the Applicant as an Environmental Assessment Practitioner (EAP) to compile this report. The contact details of the consultant who compiled the report and those of the EAP who reviewed it are as follows:

Details of the EAP who prepared this report:

Name of the Practitioner	**DM Mapoko**
Designation	Junior consultant
Tel No.	013 692 0041
Cell No.	072 116 1225
Fax No.	086 515 4103
Email	deshney@singoconsulting.co.za

Details of the EAP who reviewed this report:

Name of practitioner	**NK Singo**
Designation	Principal EAP
Tel No.	013 692 0041
Cell No.	072 081 6682
Fax No.	086 514 4103
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1.2. EXPERTISE OF THE EAP

1.2.1. QUALIFICATIONS OF THE JUNIOR CONSULTANT

- N.Dip Environmental Sciences (TUT)

1.2.2. QUALIFICATIONS OF THE PRINCIPAL EAP

- Ph.D. Geology, Applied Environmental Mineralogy & Geochemistry (UJ)
- MSc Environmental Management (University of South Africa (UNISA)
- BSc (Hons) in Mining & Environmental Geology (UNIVEN)

1.2.3. SUMMARY OF PRINCIPAL EAP'S PAST EXPERIENCE

In the year 2008, Singo Consulting (Pty) Ltd was established as an Independent Consulting Company focused to create opportunities within the Mining and Environmental Industry. With time, Singo Consulting (Pty) Ltd has diversified its services, it provides high value Geological, Hydrological, Environmental, Cleaning and Rehabilitation specialized services to clients across a range of industries that are primarily natural resource based.

The company aims to be a consulting firm that communicates sound environmental services solutions. Singo Consulting (Pty) Ltd takes pride in the fact that it holds no equity in any project and is owned by the staff, enabling it to offer clients objective support on crucial issues.

- Curriculum Vitae of the EAPs are attached in Appendix 2.

1.3. LOCATION OF THE OVERALL ACTIVITY

Table 1 below indicates the farm portions that fall within the proposed Prospecting Right Application Area.

Table 1: Locality details

Farm Name (s)	Farm Hooggenoeg 293 KS
Application Area (Ha)	Approximately 1054, 875244 Hectares.
Magisterial District	Lepelle-Nkumpi Magisterial District, Limpopo Province
Distance and direction from nearest town	Approximately 15.69 km North East of Bogalatladi Approximately 5.57 km North West of Tubex
21-digit Surveyor General Code for each Portion	T0KS00000000029300000

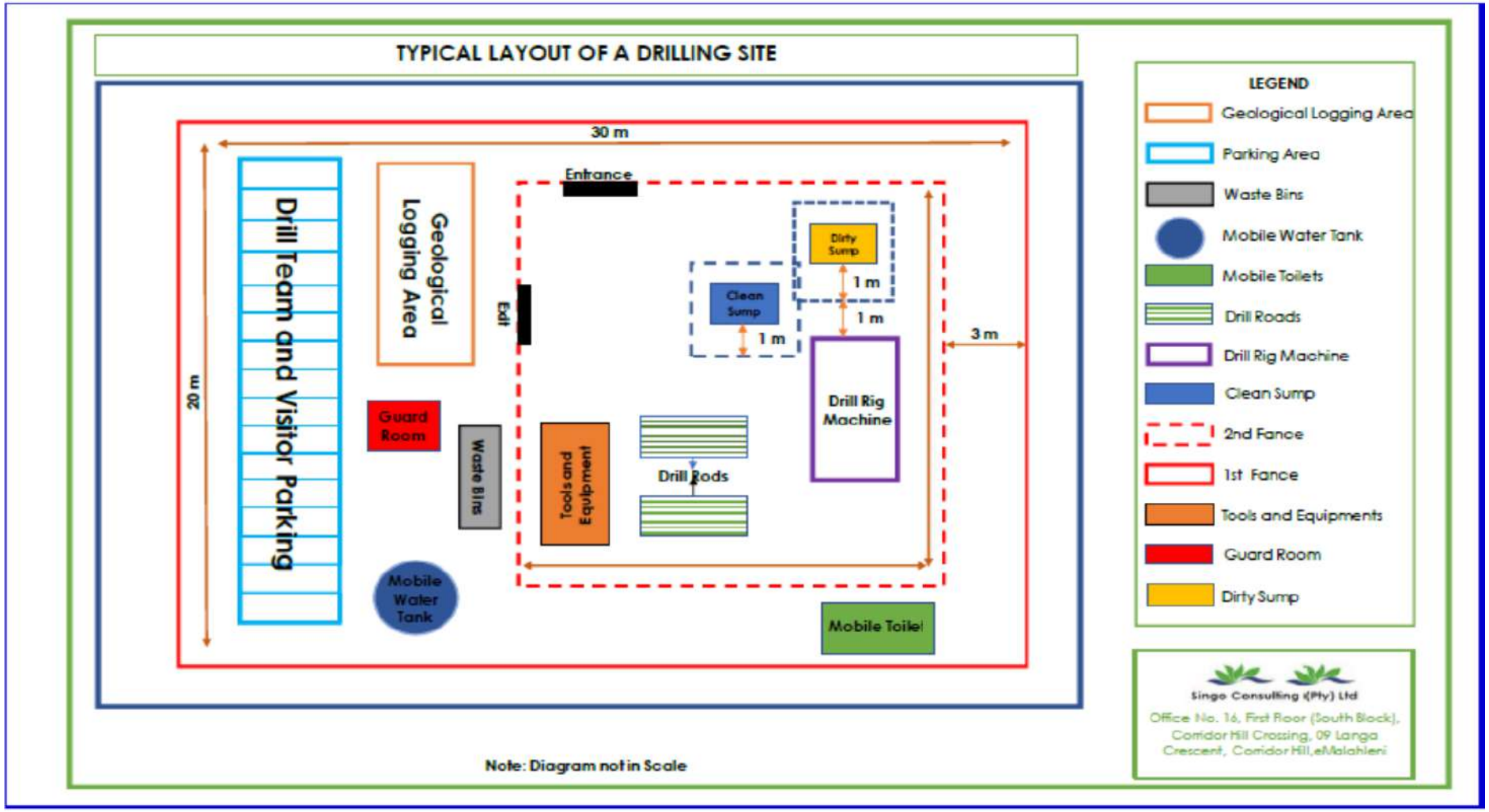

Figure 1: Typical layout plan of a drilling site

2. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

Both non-invasive and invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme (PWP). The application will follow a phased approach, where the Prospecting Work Program is divided into several sequential phases.

Figure 1 above depicts the proposed prospecting area and the proposed borehole sites of interest within the application area. Vegetation will be cleared at the borehole locations; the area is expected to be approximately 600 m^2 per borehole. There will be 15 boreholes situated in the proposed prospecting right areas. Minor access tracks will be created to access the proposed borehole sites where there are no existing roads, the total length of the access routes is anticipated to the 300 m and the approximate width is 3m.

At the end of each phase there will be a brief period of compiling and evaluating results. The results will not only determine whether prospecting proceeds, but also the manner in which it will go forward. The applicant will only action the next phase of prospecting, once satisfied with the results obtained in the previous phases. In addition, smaller, non-core parts of the prospecting work program will be undertaken, if warranted. A description of the planned invasive and non-invasive activities is detailed below.

2.1. DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES

These activities do not disturb the land where prospecting will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc.

Phase 1: Desktop study

- Compilation of historical geological data;
- Analysis of existing data and maps to further understand prospecting area structure & geology; and
- Initial targeting and ranking of prospective areas

Phase 2: Geological field mapping

This method includes ground mapping of geological features including rock outcrops, lithological contact zones, any geological structural features, surface depressions and vegetation types.

Phase 3: Semi-Regional Geophysical Survey (ground based)

Ground magnetic and probably electro-magnetic surveys will be undertaken to define the contacts of the layers with the host rocks. A consideration to conduct air-borne geophysical surveys will be made once preliminary investigations have been completed.

2.2. DESCRIPTION OF PLANNED INVASIVE ACTIVITIES

These activities result in land disturbances e.g. sampling, drilling, etc.

a) Drilling

The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying.

Diamond drilling will be of the standard NQ size. Down hole surveys will be done every 20m in each hole along transverse lines. Core will be marked, logged, photographed and sampled according to the standard of the applicants logging and sampling procedures.

Down the hole geophysical surveying will take place upon completion of the exploratory boreholes along with Ground EM surveys to determine positions of conductors.

Rehabilitation of drill sites will be done according to an approved Environmental Management Programme report

Percussion Rotary Air Blast (RAB) drilling may be carried out for pre-collaring of diamond drill boreholes or for obtaining samples if significant depth of cover is encountered over particular targets.

b) Assaying

Rock chip / soil samples will be sent to a laboratory of the applicant's choice to be crushed, split, pulverized and assayed. Samples from core will be split using a core cutter before being sent to the laboratory for analysis.

Metallurgical tests will be done by and in consultation with a preferred and accredited Laboratory of the applicant's choice.

Boreholes

The initial planned invasive prospecting activities will consist of diamond drill boreholes drilled to appropriate depths to target any anomalies identified. The work will consist of:

- Access and drill site preparation
- Diamond core drilling
- Sampling and assaying
- Quality assurance and quality control programs
- Down hole geophysics

- Rehabilitation of drill sites
- Recording & Integration of data

This phase of boreholes would determine the continuity of mineralization & potential deposit size. The work will consist of:

- Access and drill site preparation
- Widely spaced diamond drilling and analyses to confirm grade / tonnage potential
- Sampling and assaying
- Quality assurance and quality control programs
- Metallurgical test work
- Rehabilitation of drill sites
- Recording & Integration of data

This phase of boreholes would provide enough information to be able to calculate an inferred resource. The work would consist of:

- Access and drill site preparation
- Widely spaced diamond drilling and analyses to confirm grade / tonnage potential
- Sampling and assaying
- Quality assurance and quality control programs
- Metallurgical test work
- Rehabilitation of drill sites
- Recording & Integration of data

2.3. DESCRIPTION OF PRE/FEASIBILITY STUDIES

Activities in this section includes but are not limited to: initial, geological modelling, resource determination, possible future funding models, etc.

Compilation, interpretation and modelling of data

This phase will focus on compiling all the data gathered to date along with 3D modelling of any mineralized intersections. Any positively mineralized targets will be ranked. Should core drilling phase confirm mineralization with economic potential, then that target will advance to the next phase.

Desktop Pre-Feasibility Study

This phase is designed to utilize the inferred resource to determine and would include:

- Closely spaced diamond drilling
- 3D-modelling of the mineralized ore body
- Resource estimation

- A risk assessment to calculate if a full feasibility study is warranted
- Risk assessment studies

2.4. LISTED AND SPECIFIED ACTIVITIES

Table 2: Listed and specified activities

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc. E.g. for mining**, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY** (Mark with an **X** where applicable or affected).	**APPLICABLE LISTING NOTICE** **GNR 327, 325 & 324**	**WASTE MANAGEMENT AUTHORISATION** (Indicate whether an authorisation is required in terms of the Waste Management Act). **(Mark with an X)**
Prospecting Area	0.9 ha / 1054,875244 ha	**X**	GNR 327 Listing Notice 1, Activity 20.	Not required
Vegetation clearing	0.9 ha		Not Listed	
Drilling	0.9 ha		Not Listed	

Table 3: Summary of the drilling activities

Drilling method	Diamond drilling
Number of boreholes	15
Depth of boreholes	100m
Duration of drilling	A borehole takes about 4 days to complete; 15 will take at least 60 days.
Demarcated working area	0.9 ha for all 15 drilling sites
Total area to be disturbed	30*20=600m² 15 boreholes* 600m²=9000 m² 9000 m²÷10000=**0.9 ha**

3. POLICY AND LEGISLATIVE CONTEXT

Table 4: Policy and legislative context

Applicable Legislation and Guidelines	Reference Where Applied (i.e. where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
National Environmental Management Act (No. 107 of 1998)(NEMA):	This entire report is prepared as part of the prospecting right application under the NEMA, section 24	In terms of the National Environmental Management Act an Application for Environmental Authorisation is subject to a Basic Assessment Report.
Minerals and Petroleum resources Development Act (No.28 of 2002) (MPRDA): In support of the Prospecting Right Application submitted by DC Ore Minerals and Energy, the applicant is required to conduct a NEMA BAR process in terms of Section 5A and Chapter 16 of the MPRDA.	This entire report is prepared as part of the Prospecting Right Application under the MPRDA, section 16.	In terms of the Mineral and Petroleum Resources Development Act a Prospecting Right Application has been applied for Diamond minerals. The application was accepted on the 27th August 2020 DMRE Ref: **LP 30/5/1/1/2/1(13799) PR**
National Water Act (No. 36 of 1998) (NWA): Water may not be used without prior authorisation by the DWS. Section 21 of the National Water Act (No.36 of 1996) the NWA water uses for which authorisation is required.	No Water Use Licence has been applied for this prospecting project.	No water use license is required for this Application. Any water required for drilling activities will be obtained from a legal source within the area or brought in via mobile water tanker. Appropriate dust extractions /suppression equipment will be a condition imposed on the drill contractor for their drill rigs.
The National Environmental Management: Biodiversity Act (Act No. 10 of 2004 – NEMBA) Section 57 and 87	Regulations published under NEMBA provides a list of protected species (flora and fauna), according to the Act (GN R. 151 dated 23 February 2007, as amended in GN R. 1187 dated 14 December 2007) which require a permit in order to be disturbed or destroyed	No applications have been submitted in terms of the National Environmental Management: Biodiversity Act.
Lepelle-Nkumpi Integrated Development Plan (IDP)		The prospecting and mining of key minerals like Chrome are highlighted in the IDP. It also highlights the need to preserve the natural environment in the area by conducting mineral exploration that is minimally invasive to the environment.

Constitution of South Africa, Specifically, everyone has the right: a) to an environment that is not harmful to their health or wellbeing; and b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that i) prevent pollution and ecological degradation; ii) promote conservation; and iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	BAR & EMPr	Prospecting activities will only proceed after effective consultation. All activities will be conducted in a manner that does not violate the Constitution of the Republic of South Africa.
National Heritage Resources Act, 1999	Management measures	Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and SAHRA notified in order for an investigation and evaluation of the find(s) to take place.

4. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

Mining in South Africa directly contributed to the establishment of the Johannesburg Stock Exchange in the late 19th century, and today it still accounts for a large portion of its market capitalization. From this, it is clear that mining in South Africa has shaped the country politically, culturally, and economically and that the South African mining sector has provided the critical mass for a number of industries that are either suppliers to the mining industry, or users of its products. These include, but are not limited to, energy, financial services, water and engineering services, and specialist seismic geological and metallurgical services. The proposed Chrome Prospecting Right will not only contribute directly to the South African economy but will also contribute to the development and growth of other industries supporting the mining sector.

The proposed Prospecting Right Application is within the Lepelle Nkumpi Local Municipality Limpopo Province, South Africa. The municipality as faced with elevated rates of unemployment and poverty, making development one of the municipality's priorities. According to the local municipality's Integrated Development Programme, census 2011,

Lepelle-Nkumpi Municipality has very high level of poverty, with more than 15% of households without any form of income and 45,69% of unemployed individuals within the municipality. This means that more people within the Lepelle Nkumpi Local Municipality are currently seeking for employment. The need for the approval of this applied Prospecting Right is therefore crucial as it offers a chance that the applied minerals could be prospected in an economically, environmentally and socially viable manner, should the results yield sufficient resources to allow for mining, a new mine may be developed which would create more employment opportunities in the area.

5. MOTIVATION FOR THE OVERALL PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVE

Geophysical surveys, and drilling are the only major methods used in exploring for deposits of this type and also for resource definition and evaluation. The technology to be used cannot be replaced by any other methods thus these are the preferred activities.

There is no site or layout alternative as the property provides the ideal geological formation for the presence of the minerals applied for. The positioning of the boreholes is determined by the expected location of the mineral reserve.

There are no technology alternatives considered and the proposed site was identified as the preferred alternative due to the following reasons:

- The site offers the mineral sought after,
- Very little natural vegetation needs to be disturbed in order to establish the prospecting area (0.9 ha).
- The prospecting area can be reached by using the road extending from the Orrie Barragwanath Pass road that passes through the farm boundary on the southern side.
- No residual waste as a result of the prospecting activities will be produced that needs to be treated on site. The general waste produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site.
- As maintenance and servicing of the equipment will be done at an off-site workshop the amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental oil or diesel spillages.
- Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site, more information will be discussed after the granting of the prospecting right.

6. FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE

6.1. DETAILS OF DEVELOPMENT FOOTPRINT ALTERNATIVES

The development footprint is expected to be a fraction of the application area size, which is estimated to be 1054,875244 hectares. The geology is the primary driver in determining the location of prospecting area.

6.1.1. PROPERTY

The proposed Prospecting Right area is situated over the farm Hooggenoeg and is located approximately 15.69 km North East of Bogalatladi and approximately 5.57 km North West of Tubex within the Lepelle-Nkumpi Local Municipality. **Figure 2** below illustrates the locality of the project area.

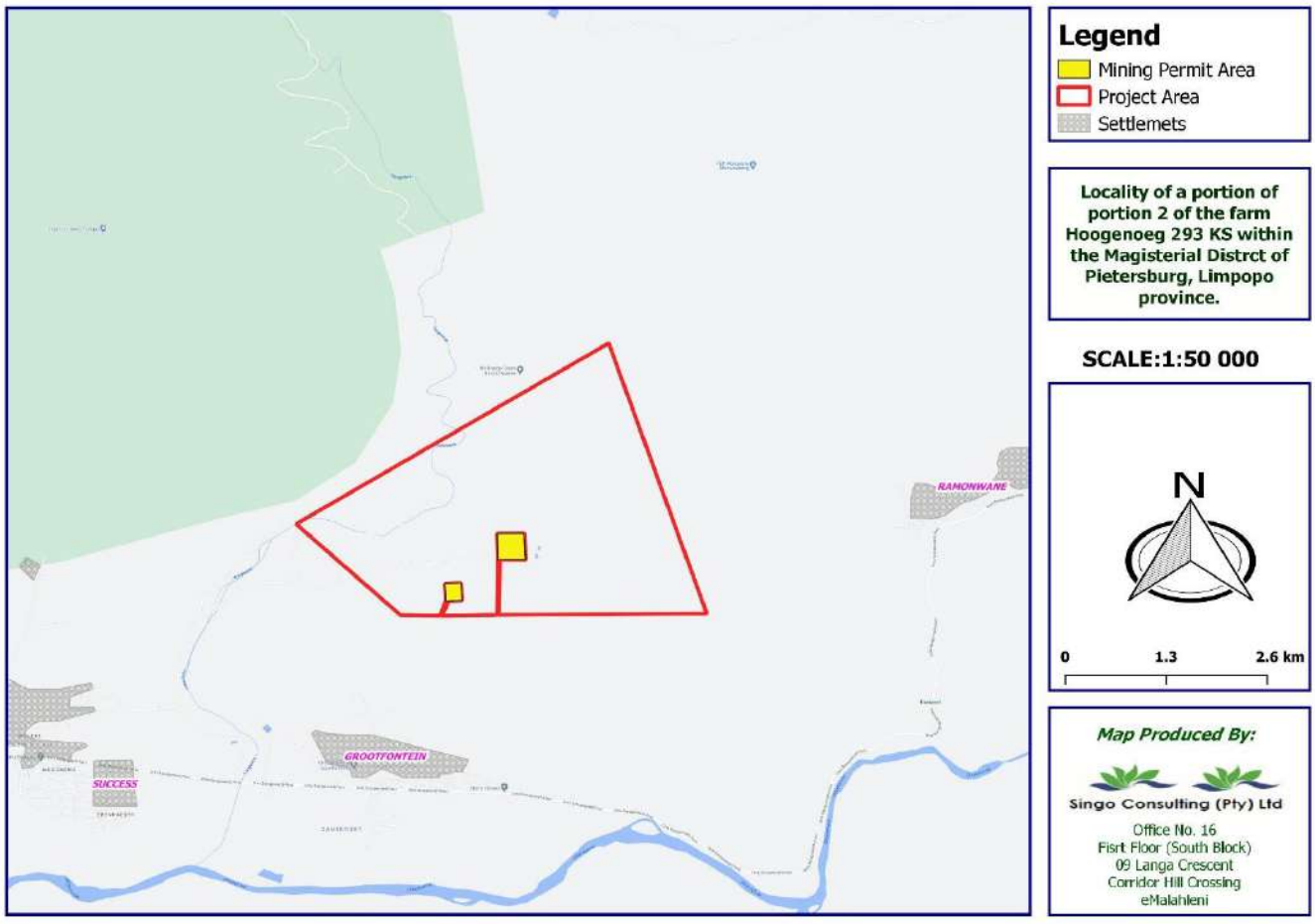

Figure 2: Locality map of the project area

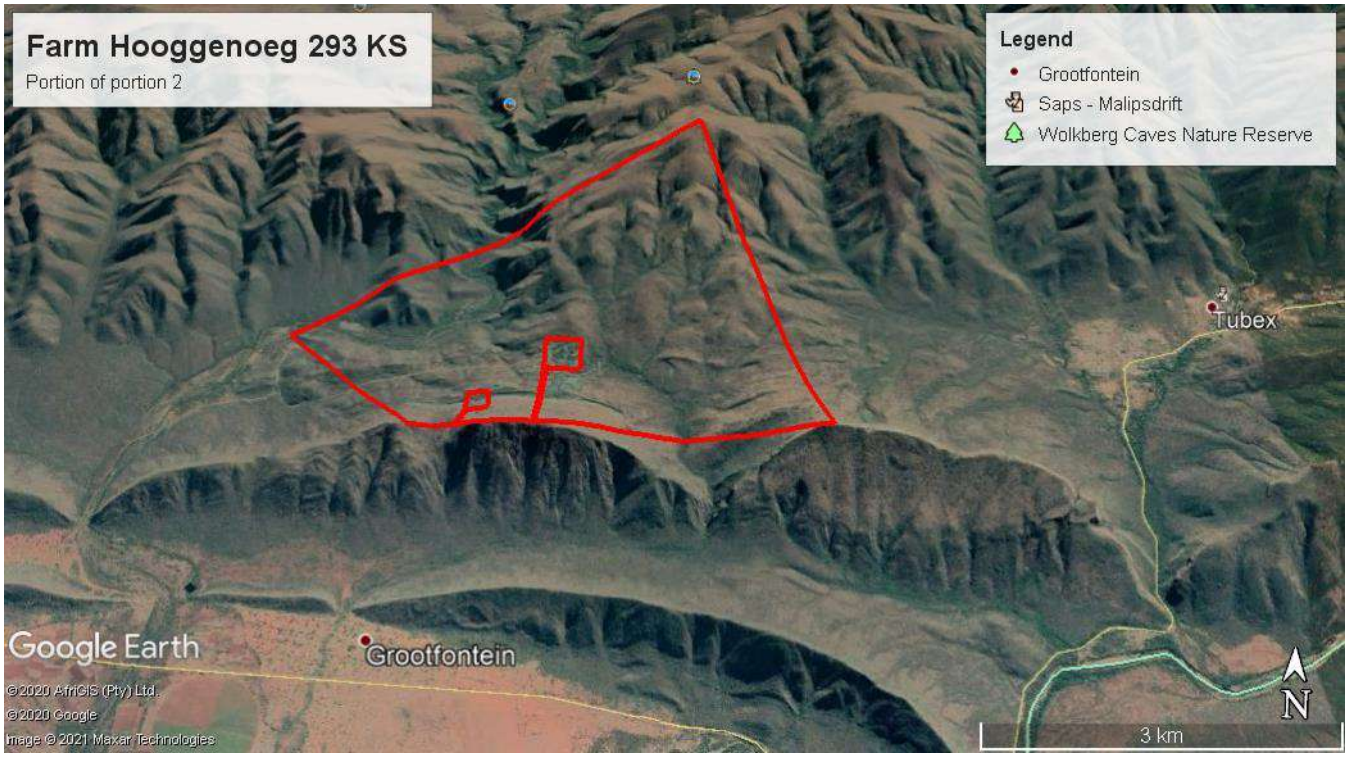

Figure 3: Google earth map displaying the locality of the proposed project area

6.1.2. TYPE OF ACTIVITY

Due to the unavailability of extensive historical borehole datasets, invasive prospecting activities such as drilling as well as non-invasive activities will be conducted during prospecting. No bulk sampling work will be carried out during this prospecting program.

6.1.3. DESIGN OR LAYOUT

Since exploration is temporary in nature, no permanent structures will be constructed. Negotiations and agreements will be made with the farm owners to use any existing infrastructure like access roads.

- Portable ablution facilities will be used.
- Activities will be limited to the drilling of 15 boreholes to be determined by the geological formations found during prospecting.
- It is planned to use one rig for all drill holes.
- Rehabilitation will be closely controlled and supervision will be focussed.
- No changes to the layout is considered but with the geophysical survey information, the boreholes can be orientated to match the shape of the good quality of resource.

6.1.4. TECHNOLOGY ALTERNATIVES

The technologies listed in the PWP have been selected as they are proven effective in the determination of resource viability within the proposed prospecting area. Some of the techniques employed in the non-invasive prospecting will include a literature survey, field reconnaissance/mapping, and geophysics survey of the geology, outcrops. Invasive technology alternatives have also been considered. It is hereby noted that the different phases and timeframes of the prospecting herein envisaged are, by their nature, dependent on the results obtained during the preceding phases of such prospecting. The proposals set out in the Prospecting Work Programme are therefore made on the basis that results obtained during the preceding phases may necessitate reasonable changes and adaptations to such proposals, which will be reported as prescribed.

6.1.5. OPERATIONAL ASPECTS

Operational aspects that have been considered for the effective implementation of the PWP include financial arrangements, appropriate equipment available, and technical skills available. The proposed work plan finances will be sourced from DC Ore Minerals and Energy over the next five years. The company has ensured that technical personnel are available to execute the prospecting work programme as well as the equipment desired.

6.1.6. OPTION OF NOT IMPLEMENTING

If the Prospecting Right is not granted, the potential to identify viable mineral resources could be lost. Historical prospecting and mining activities have taken place in the vicinity of the proposed prospecting right area and as such the proposed prospecting activities represent a continuation of surrounding land uses. Additionally, it allows for marginal land impacted on by historical prospecting and mining activities to be re-introduced into the economy.

6.2. DETAILS OF THE PUBLIC PARTICIPATION PROCESS TO BE FOLLOWED

6.2.1. PUBLIC PARTICIPATION METHODOLOGY

This section of the report provides an overview of the tasks undertaken for the Public Participation Process to date. The public participation process was undertaken in accordance to the requirements of the EIA Regulations, 2014 (as amended, 07 April 2017) particularly Chapter 6 of this Regulation. It provides a guideline on how Public Participation Processes must be conducted, it further stipulates timeframes in which these processes must be conducted in accordance to:

- **Stakeholder as well as Landowner identification and notification**

The Public Participation Process (PPP) mainly comprises the communications and discussions with Interested and Affected Parties (I&APs) and is of utmost importance in any assessment process. The PPP, inter alia, involves the following:

Notification of Stakeholders

- ✓ Personnel representing Government Departments and Non-Governmental Organizations were consulted using Background Information Document (BID), Consultation emails. The following departments and organizations formed part of the consultation process;

These I&APs' details were collected using information in the public domain. Using this information these identified I&APs were contacted via email with Background Information Documents containing a description of the prospecting operation and a way to contact for further information and how to be part of the process. These identified I&AP's are provided a period of 30 calendar days.

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Deeds Office Property

HOOGGENOEG, 293, 2 (LIMPOPO)

GENERAL INFORMATION

Deeds Office	LIMPOPO
Date Requested	2021/01/15 10:17
Information Source	DEEDS OFFICE
Reference	-

PROPERTY INFORMATION

Property Type	FARM
Farm Name	HOOGGENOEG
Farm Number	293
Portion Number	2
Local Authority	LEPELE-NKUMPI LOCAL MUNICIPALITY
Registration Division	KS
Province	LIMPOPO
Diagram Deed	T31705/984
Extent	1075.2618H
Previous Description	-
LPI Code	T0KS00000000029300002

OWNER INFORMATION

Owner 1 of 2

Company Type	GOVERNMENT
Name	PROVINCIAL GOVERNMENT OF LIMPOPO
Registration Number	
Title Deed	T25563/1984PTA
Registration Date	1984/05/23
Purchase Price (R)	SECT 28
Purchase Date	-
Share	
Microfilm Reference	
Multiple Properties	NO
Multiple Owners	NO

Owner 2 of 2

Company Type	GOVERNMENT
Name	PROVINCIAL GOVERNMENT OF LIMPOPO
Registration Number	
Title Deed	T79567/2015PTA
Registration Date	-
Purchase Price (R)	TRANSFER BY ENDO
Purchase Date	-
Share	
Microfilm Reference	
Multiple Properties	NO
Multiple Owners	NO

ENDORSEMENTS (3)

#	Document	Institution	Amount (R)	Microfilm
1	VA4137/1993PTA	K36/1970RM	UNKNOWN	
2	VA7110/2015PTA	REPUBLIEK VAN SUID-AFRIKA	UNKNOWN	
3	CONVERTED FROM PTA	-	UNKNOWN	

HISTORIC DOCUMENTS (1)

#	Document	Owner	Amount (R)	Microfilm
1	T31705/1984PTA	REPUBLIEK VAN SUID-AFRIKA	CRT	

Figure 4: Deed results for portion 2 of the farm Hooggenoeg 293 KS

6.3. SUMMARY OF ISSUES RAISED BY I&APs

Consultation with relevant stakeholders, including the Mathabatha Traditional Authority has taken place during the time of compiling this report. The Mathabatha Traditional Council is in support of the proposed activity. This is evident on the letter that was written to the Limpopo DMRE by Kgoshi Mathabatha Moleke Malegodi as the chairperson of Mathabatha Traditional Council on the 02nd of December 2020 stating that the Traditional Council is allowing DC Ore Minerals and Energy to be granted prospecting rights. The Traditional Council also gives permission to the applicant to conduct the applied prospecting activities should the application be granted. The letter confirms that DC Ore Mineral and Energy has already consulted with the community, Headmen, Ditlou-Ntshong Development Forum and Mathabatha Traditional Council and the resolution was made on the 09th October 2020 at the Mathabatha Tribal Office. See **Appendix 5** for proof of consultation with the Traditional Council.

6.4. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

6.4.1. SOCIO-ECONOMIC CONTEXT

The proposed prospecting site is located in the Lepelle Nkumpi Local Municipality of the Limpopo Province.

Lepelle Nkumpi is one of the four local municipalities within the Capricorn District Municipality in Limpopo Province and is located in the southern part of the Capricorn District. The municipality is pre dominantly rural with a population of approximately 233925 people (stats SA community survey, 2016), with a total of 61305 households and a n average household size of 3.8. It covers 3,464.00 hectares, which represents 16% of the District's total land area and is divided into 30 wards which comprise a total of 94 settlements a 2279 people per settlement, Lebowakgomo SDF 2007) 2007). About 95% of its land falls under the jurisdiction of Traditional Authorities. See below for the summary of the local stats.

Table 5: Population groups in Lepelle Nkumpi Local Municipality

Municipality	Population				No. of Households				Average Households Size			
	1996	2001	2011	2016	1996	2001	2011	2016	1996	2001	2011	2016
Lepelle Nkumpi	23496	227 970	230350	233925	44 397	51 682	59 682	61 305	5.2	4.4	3.9	3.8

(source: Stats SA community survey, 2016)

According to the Stats SA: census 2001 and 2011, Lepelle Nkumpi has increased its education on all levels, except for primary education, between 2001 and 2011 (the levels have dropped from 36% to 35% respectively). The population that has completed the secondary education has increased by 18% (from 29% in 2001 to 47% in 2011). 6% of the population has completed tertiary education in 2011.

The increase in education levels indicated that a growing proportion of the population has at least gained basic reading and writing skills, allowing for a greater potential in further skills training or acquiring employment opportunities.

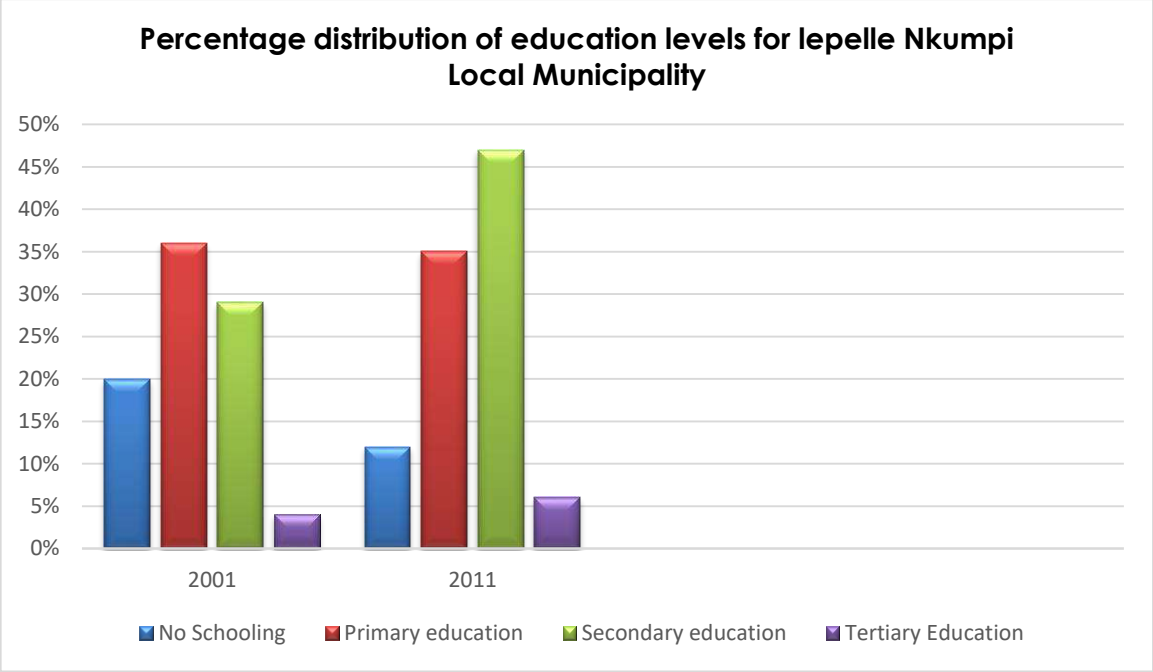


Figure 5: Graph depicting the percentage distribution of education levels for Lepelle Nkumpi Local Municipality

Source: census 2011

6.4.2. TYPE OF ENVIRONMENT AFFECTED BY THE PROPOSED ACTIVITY

6.4.2.1. GEOLOGY

Regional geology

Transvaal Supergroup

The Transvaal Supergroup is preserved within three basins on the Kaapvaal craton, Kanye in Botswana, and the Transvaal and Griqualand West basins in SA. For much of the lower part of the Transvaal, deposition of these sediments took place within one large epeiric basin, and the three basins preserved now represent only remnants of that very large depository. For the upper parts of the Transvaal Supergroup, deposits in the three basins tend to be different and at least partly unique to each preserved basin. Age of the Transvaal Suprgroup is from c. 2660 Ma for the basal "protobasinal rocks", found only at the base of the Transvaal sub-basin succession, to c. 2.6-2.4 Ga for the chemical sediments of the Chuniesport-GhaapTaupone Groups (single chemical basin across much of the craton), to the Pretoria Group which is not accurately dated, but which is c. 2.3-2.1 Ga.

The uppermost units, the Rooiberg Group and overlying lavas and sediments of the Loskop, Rust de Winter and Glentig Formations, although stratigraphically part of the Transvaal Supergroup, really represent genetically, the onset of the Bushveld Complex, which intruded into the Transvaal (sub-) basin. The succession

in the latter basin is the thickest and reaches up to about 12 km, with only about 4-5 km being preserved in the Griqualand West sub-basin.

Transvaal sedimentation began at least 2.6 Ga ago in the Transvaal sub-basin, and early protobasinal rocks (a purely descriptive term) may have been coeval with late stage Ventersdorp Supergroup events. Alternatively, and more likely, they reflect local rifted basins within the Kaapvaal craton, formed as a result of stresses on that craton during the Limpopo mobile belt collision, and in which immature alluvial sediments and acid-to mafic lavas were deposited.

Uppermost protobasinal rocks are much more widespread, linking these various protobasinal rifts and reflect deeper water more mature sedimentation – they likely reflect a foreland basin resulting from the uplifted Limpopo orogen. The protobasinal rocks are unconformably overlain by the thin (10-60 m) sheet sandstones of the Black Reef Formation in the Transvaal sub-basin, which were laid down by rivers. At about the same time, in the Griqualand West subbasin, sedimentation began with the mixed clastic and chemical shallow marine shoreline and continental deposits (plus minor lavas) of the Schmidtsdrif Subgroup.

Thereafter, at c. 2.58 Ga, all three Transvaal subbasins and much of the Kaapvaal craton were drowned by a rise in global sea levels, probably related to high rates of continental crustal growth globally. Much of the craton was now covered by a shallow sea, with water depths of 100-200 m, and in which limestone deposits, minor shale and some chert were laid down. These sediments were often trapped by very large cyancobacterial colonies which thrived in the clean shallow epeiric sea conditions, and, as they were photosynthetic, produced oxygen which was taken up by the seawater and which later oxidised the iron minerals deposited above the carbonate rocks in the then deeper (c. 200m) epeiric sea (ie Penge Fm. In Transvaal sub-basin, and Asbesheuwels Subgroup in Griqualand-West).

Sea levels rose and fell four times during deposition of the Chuniespoort and Ghaap Groups, and deposition of the uppermost iron formations was most likely related to widespread seafloor volcanism (i.e. fumaroles) in deeper water areas adjacent to the Kaapvaal craton. Mixed clastic and chemical sediments in the Koegas Subgroup represent the shrinking epeiric sea and its final retreat off the Kaapvaal craton, while the Duitschland Formation in the Transvaal sub-basin largely reflects weathering and reworking of Chuniespoort rocks.

Following a major, regional unconformity and significant time gap, sedimentation continued separately in the Transvaal and Griqualand West sub-basins. In the Transvaal sub-basin, the Pretoria Group (largely alternating shales and sandstones, lesser andesitic lavas and minor conglomerates, ironstones) reflects two rifting events, during which alluvial deposits, volcanic rocks and some lakes formed, followed in each case by slower thermal subsidence, when sea level rose and drowned the basin, and in which deeper water shales and coastal sandstones were laid down, by a general clastic, shallow epeiric sea.

A major andesitic flood basalt (Hekpoort Formation) was associated with the onset of the second rifting event, and covered the Kaapvaal craton as far as the Griqualand West sub-basin, where it is known as the Ongeluk Formation. In the Griqualand West sub-basin, this is underlain by the Makganyene Diamictite Formation,

probably of glacial origin. Above the Ongeluk are two chemical sedimentary formations (Hotazel and Mooidraai), which contrast to the much thicker and clastic sedimentary succession of the Pretoria Group.

Finally, for the Transvaal sub-basin, impingement of the large Bushveld Complex (2053 Ma) mantle plume at the base of the Kaapvaal craton resulted in partial melting of this craton, and the outflow of the thick (up to 7 km) Rooiberg acidic lavas. They were laid down in faulted smaller basins, associated with irregular occurrences of immature continental sediments.

Local Geology

The Hooggenoeg 293 KS farm is located within the Duitschland, Klapperkop quartzite and Timeball Hill formation; however, the underlying geology specific to the prospecting area is the Klapperkop quartzite, Duitschland, Penge, Malmani and Timeball Hill formation. The thick shales and subordinate sandstones of the Timeball Hill formation are generally ascribed to a fluvio-detltaic basin fill sedimentation system (Erikson, 1973). A basal black shale facies, associated basin- wide in the subsurface with lavas and pyroclastic rocks of the Bushy Bend lava member reflects suspension sedimentation and fumarolic eruptions. Succeeding rhythmically interbedded mudstones/ siltstones and fine-grained sandstones are interpreted as turbidite deposits (Kuenen, 1963; Button, 1973). These grades up into the medial Klapperkop Quartzite member interpreted as fluvio-deltaic sandstones which fed the more distal turbidites, tidal reworking of these sands is also inferred.

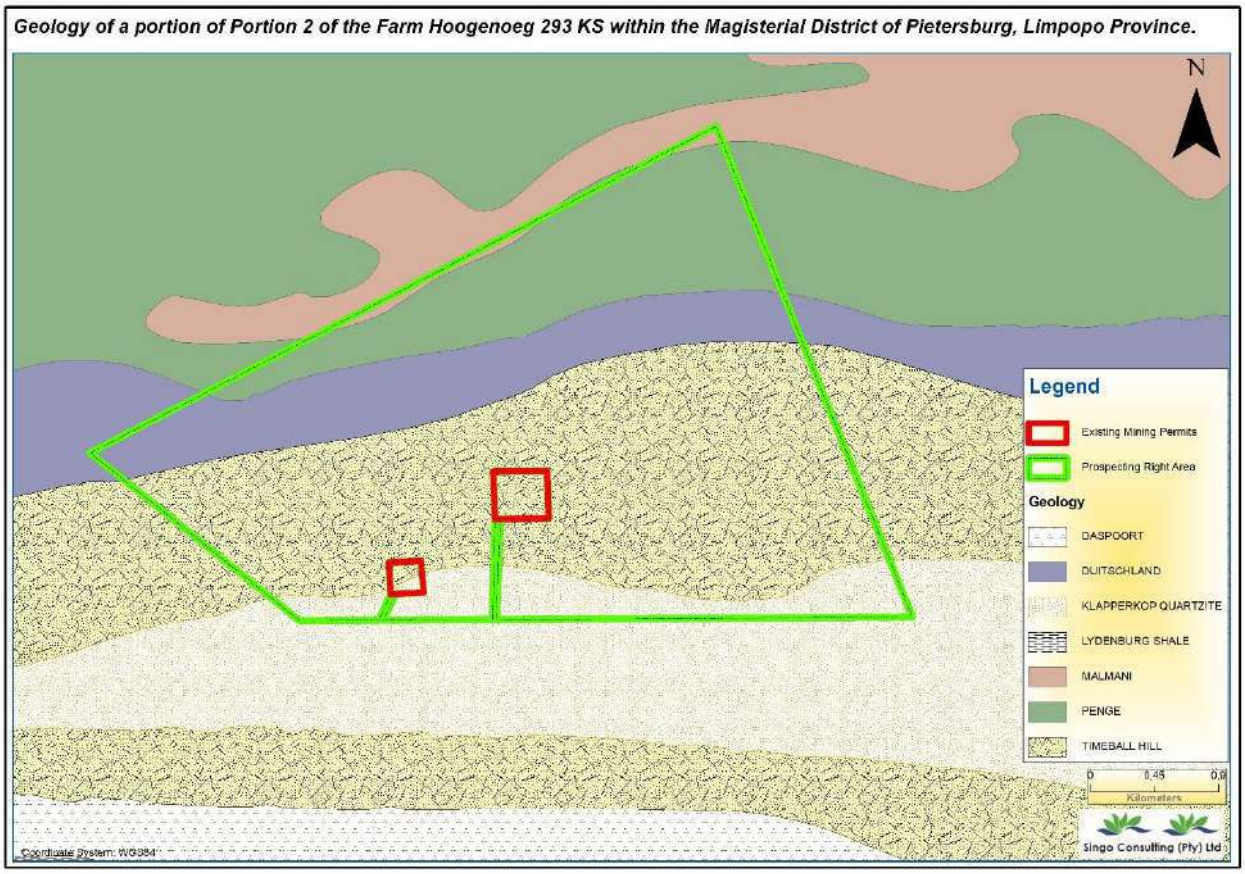


Figure 6: Geology map of the project area

6.4.2.2. TOPOGRAPHY & SOILS

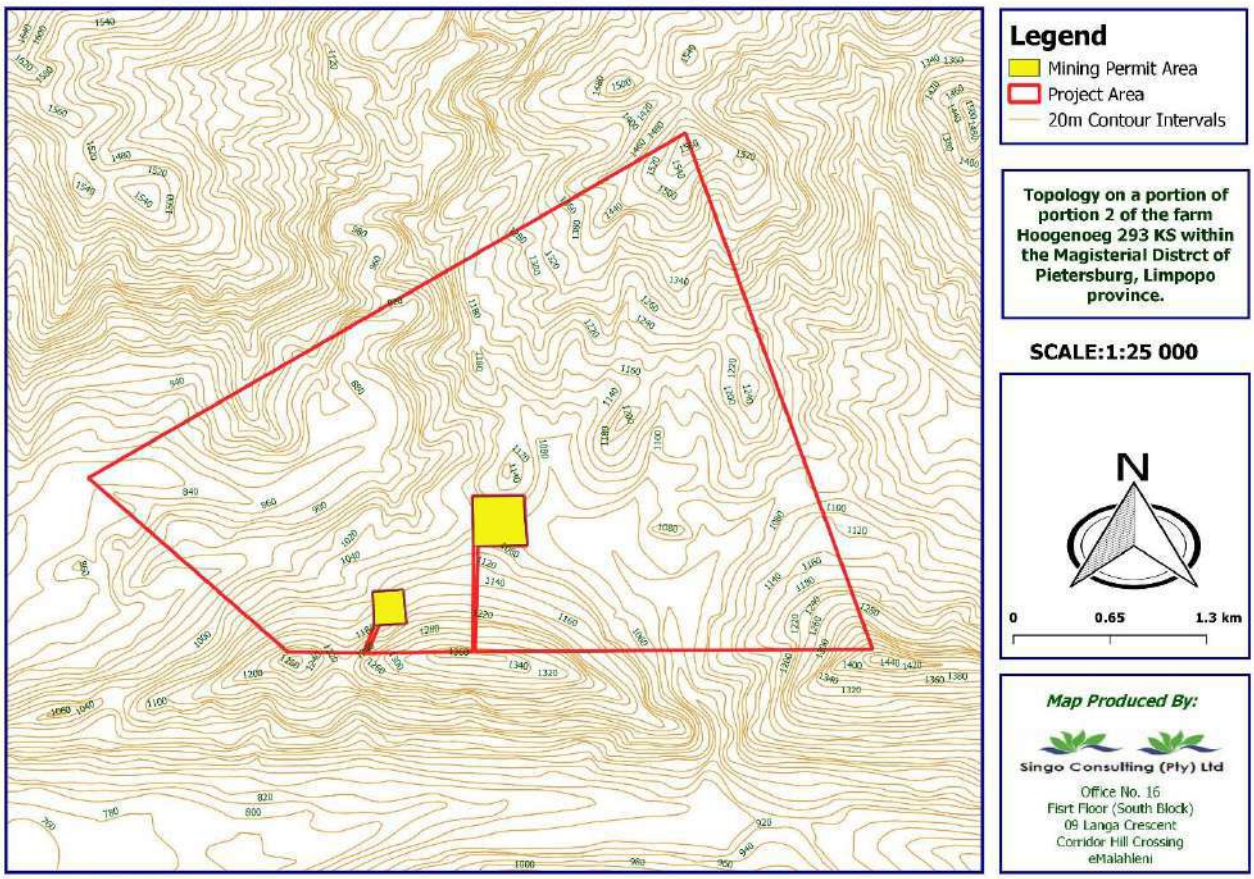


Figure 7: Topographical map of the project area

Topography is the study of the shape and features of land surfaces. The topography of an area could refer to the surface shapes and features themselves, or a description (especially their depiction in maps). Topography is a field of geoscience and planetary science and is concerned with local detail in general, including not only relief but also natural and artificial features, and even local history and culture. This meaning is less common in the United States, where topographic maps with elevation contours have made "topography" synonymous with relief.

The slope within and around the project area is not uniform and this is evident by the contour lines which are neither evenly nor parallel spaced. The proposed prospecting area is situated within a region characterized hills topography of the farm Hooggenoeg 293 KS. This can be observed on the topology map attached below as the altitude is generally on average of 840-1550 metres above sea level. See **Figure 7** above.

6.4.2.3. SOIL CLASSES

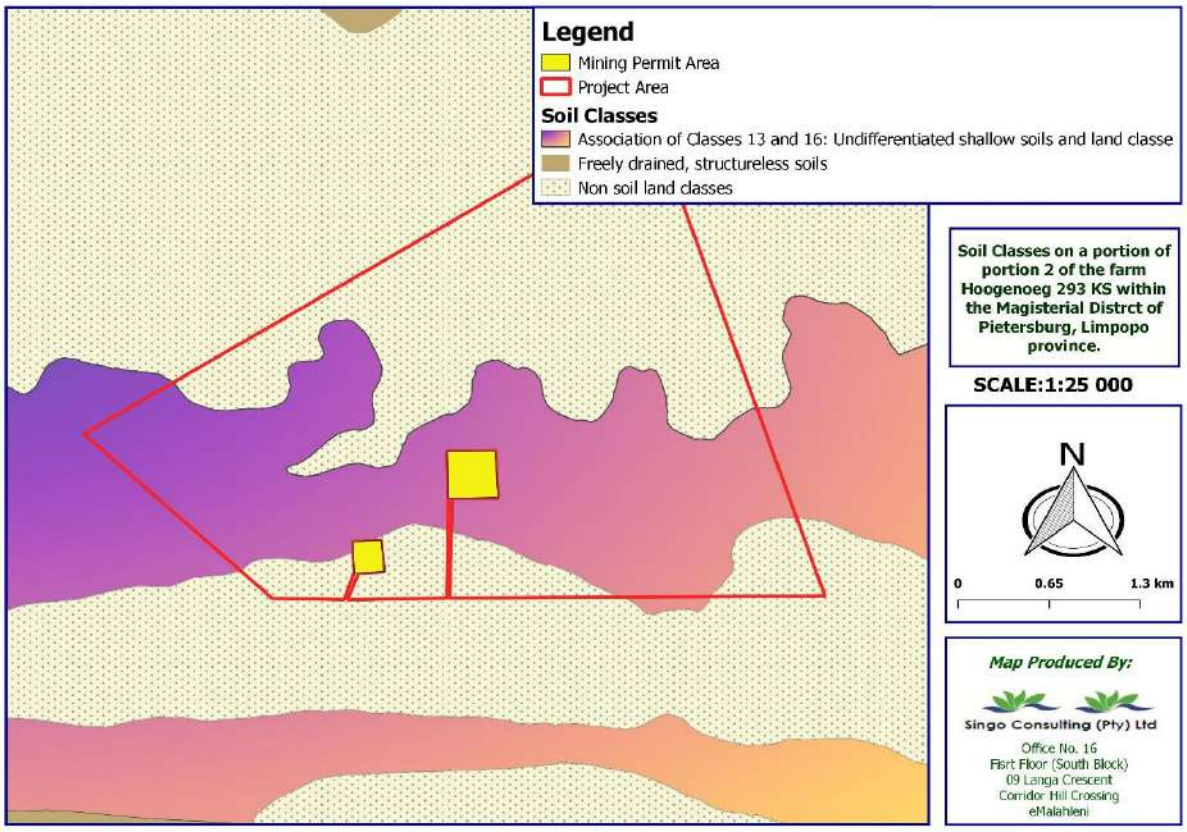


Figure 8: Soil classes map of the project area

A map in ***Figure 8*** above was produced from a desktop study. From the map, it can be deduced that the prospecting area is covered with two soil classes, namely the non-soil land classes and the association of classes 13 and 16: undifferentiated shallows soils and land classes.

Shallow soils are common in hilltops, hillsides and throughout mountainous regions, where thin topsoil may be the only thing that lies between the ground surface and subsurface rock layers. This type of soil does not provide effective support for the trees and shrubs growing on it. The large plants or the trees that grow on this soil are consequently vulnerable to wind and may be blown down.

6.4.2.4. HYDROLOGY

Groundwater

Two distinct aquifer types exist which are shallow weathered aquifer (unconfined) and Upper fractured aquifer (unconfined to semi-confined) (less than 70 to 90mbgl).

1. **Shallow weathered aquifer (unconfined)**

Overburden/Weathered Zone Aquifer

- The weathered zone of the Transvaal sediments hosts the unconfined or semi-confined shallow weathered Transvaal aquifer. Water levels are often shallow (few meters below ground level) and the

water quality good due to direct rainfall recharge and dynamic groundwater flow through the unconfined aquifer in weathered sediments, which makes it also vulnerable to pollution.

- Water intersections in the weathered aquifer are mostly encountered above or at the interface to fresh, where the vertical infiltration of water is typically limited by impermeable layers of weathering products and capillary forces, with subsequent lateral movement following topographical gradients.
- Localised perched aquifers may occur on clay layers or lenses at shallower depth (soil zone) but are due to their localised and detached nature of no further interest in the context of the current study.
- Alluvial deposits occur in most valley bottoms associated with surface water courses, but their regional coverage is small. These unconsolidated alluvial sediments comprise of clay, sand, gravel and boulder sized grains.

2. Fractured aquifer

Upper fractured aquifer (unconfined to semi-confined) (less than 70 to 90mbgl)

- The weathered aquifer is underlain by a deeper semi-confined to confined fractured aquifer in which fracture flow dominates. The fractured Transvaal aquifer consists of the various lithologies of siltstone, shale, sandstone and quartzite, where groundwater flow is governed by secondary porosities like faults, fractures, joints, bedding planes or other geological contacts, while the rock matrix itself is considered impermeable.
- Geological structures are generally better developed in competent rocks like sandstone, which subsequently show better water yields than the less competent silt- or mudstones. Not all secondary structures are water bearing due to e.g. compressional forces from the neo-tectonic stress field overburden closing the apertures.

Surface water

The proposed project area falls within the Olifants Water Management Area between the Quaternary Catchments B71B and B71A. The hydrology surrounding the proposed area is very important during prospecting. In this context hydrology is all the surface waters appearing within and nearby the proposed project area, where a potential to be impacted upon by the project exist. The hydrology map, illustrates that the following water bodies exists:

- Channelled valley-bottom wetland
- Unchanneled valley-bottom wetland
- Non- perennial river
- Perennial river

The screening report that has been developed in this office has revealed that the proposed prospecting area has an aquatic biodiversity that is of very high sensitivity, with features including the Tongwane river which is crossing the area on the north-eastern side of the project area, as well as the strategic water source area, see **Figure *12***. 100m hydrological buffer zones will be developed as shown on the ***Figure 11*** below. These buffers will ensure no physical prospecting will take place on the observed water resources within the project area.

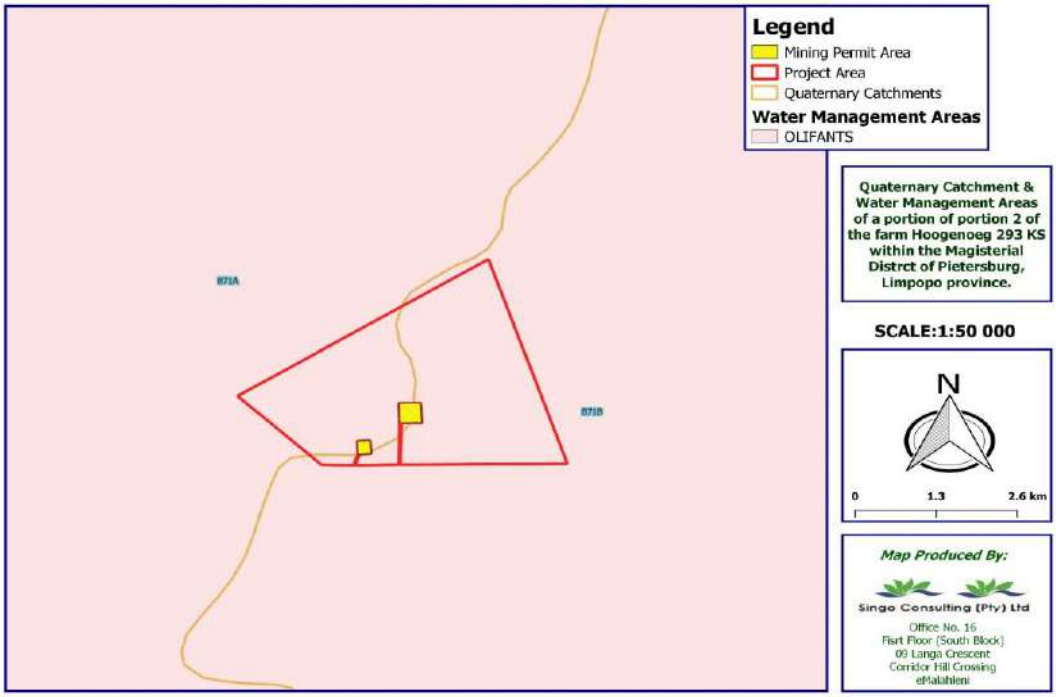


Figure 9: Quaternary Catchment and Water Management Areas map

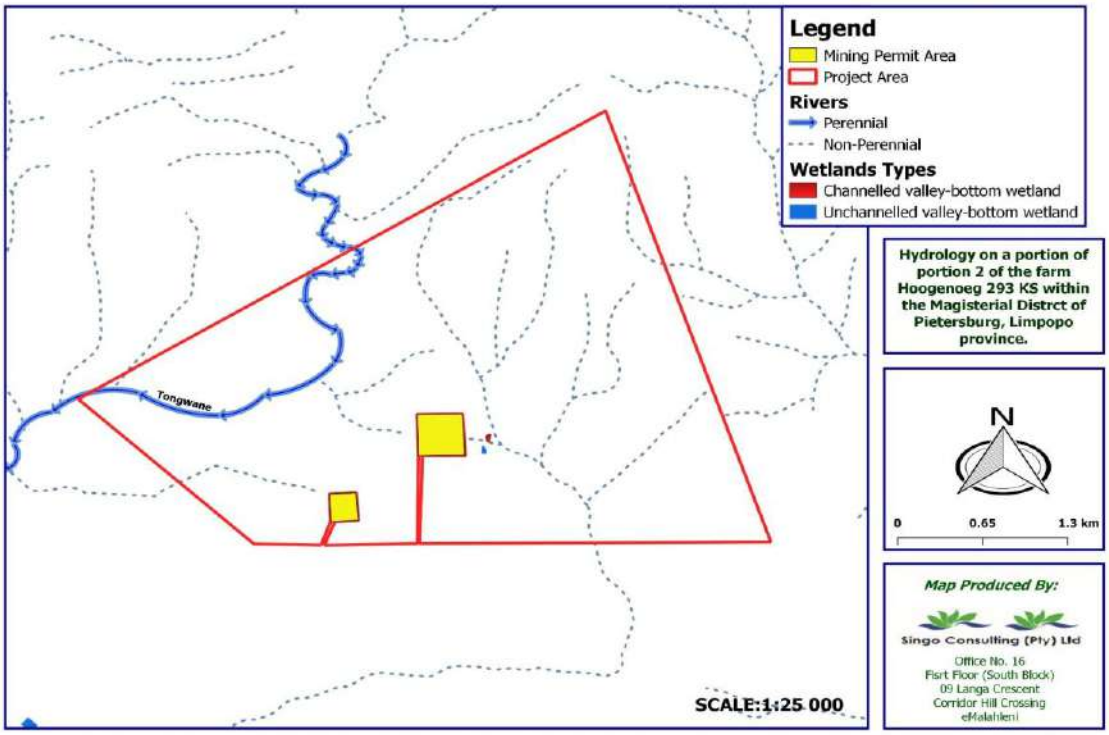


Figure 10: Hydrology map of the project area

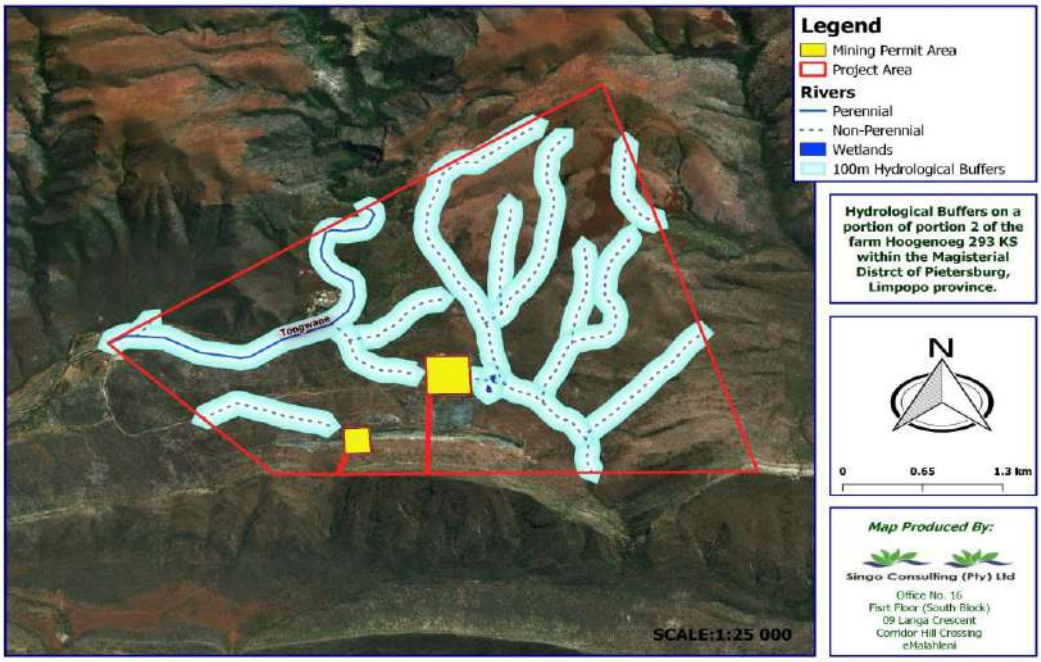
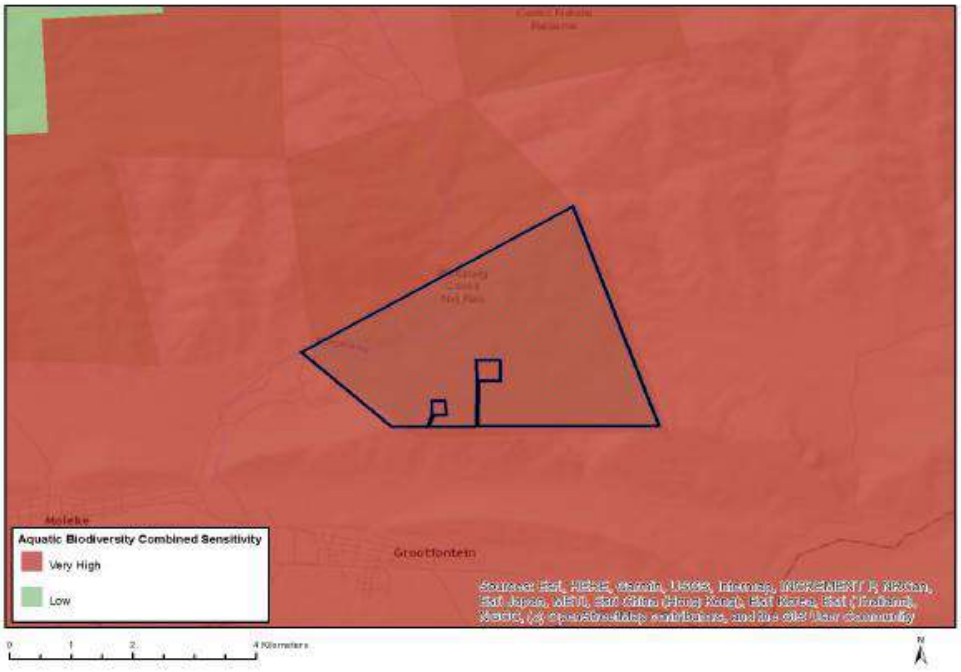


Figure 11: Buffer zone map for the project area

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Figure 12: Map of relative aquatic biodiversity theme sensitivity ***source: screening report***

6.4.2.5. VEGETATION

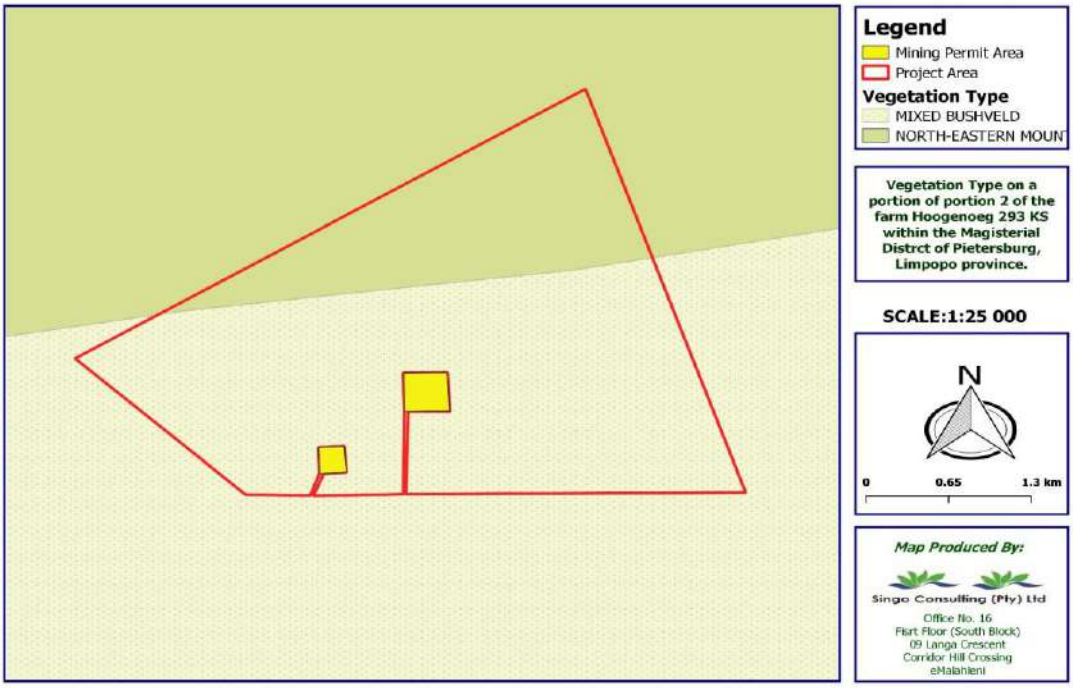
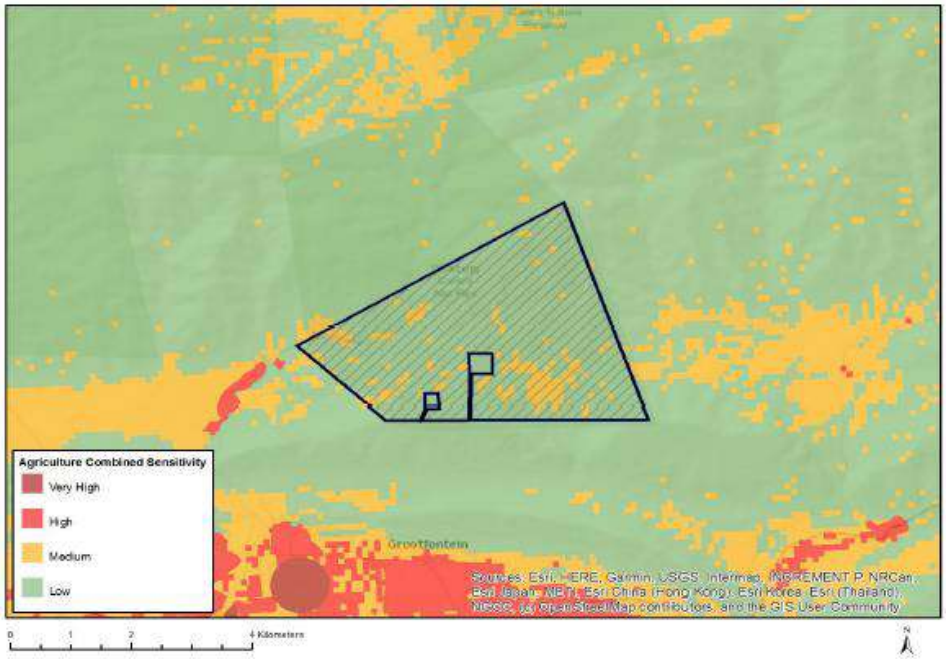


Figure 13: Vegetation type map

The vegetation type of the proposed prospecting area is dominated by the mixed Bushveld, see **Figure *13***. The Bushveld is a sub-tropical woodland ecoregion of Southern Africa named after the term veld. It encompasses most of Limpopo Province and a small part of the North West Province of South Africa, the Central and North-East Districts of Botswana and the Matabeleland South and part of the Matabeleland North provinces of Zimbabwe. Kruger National Park in South Africa has a number of 'Bushveld' camps.

Approximately 0,9 ha of vegetation will be cleared during prospecting, however, care will be taken to be ensure that any protected species identified are relocated outside the footprint of the prospecting activities. The cleared area with vegetation will be will be concurrently rehabilitated per drill site. According to the screening report that was developed in this office through the national web screening tool, the several development areas were created including the agricultural sensitivity, animal species as well as the plant species sensitivity themes. The agricultural theme showed results that the area has medium agricultural sensitivity, see **Figure *14*** below. Another development footprint environmental sensitivity identified includes the plant species theme which showed that the proposed prospecting area is of medium sensitivity with features including but not limited to the sensitivity species 275 and the Polygala sekhukhuniensis which is endemic to sekukhuneland, Limpopo province. This plant species is sparsely vegetated heavy metal rich soils on lower slopes and valley bottoms. Its major habitats include the Sekhukhune mountain bushveld as well as the Sekhukhune plains bushveld. It occurs within the small areas of highly erodible clay and mineral rich soils; to which it appears to be specifically adapted (Siebert et al. 2010).

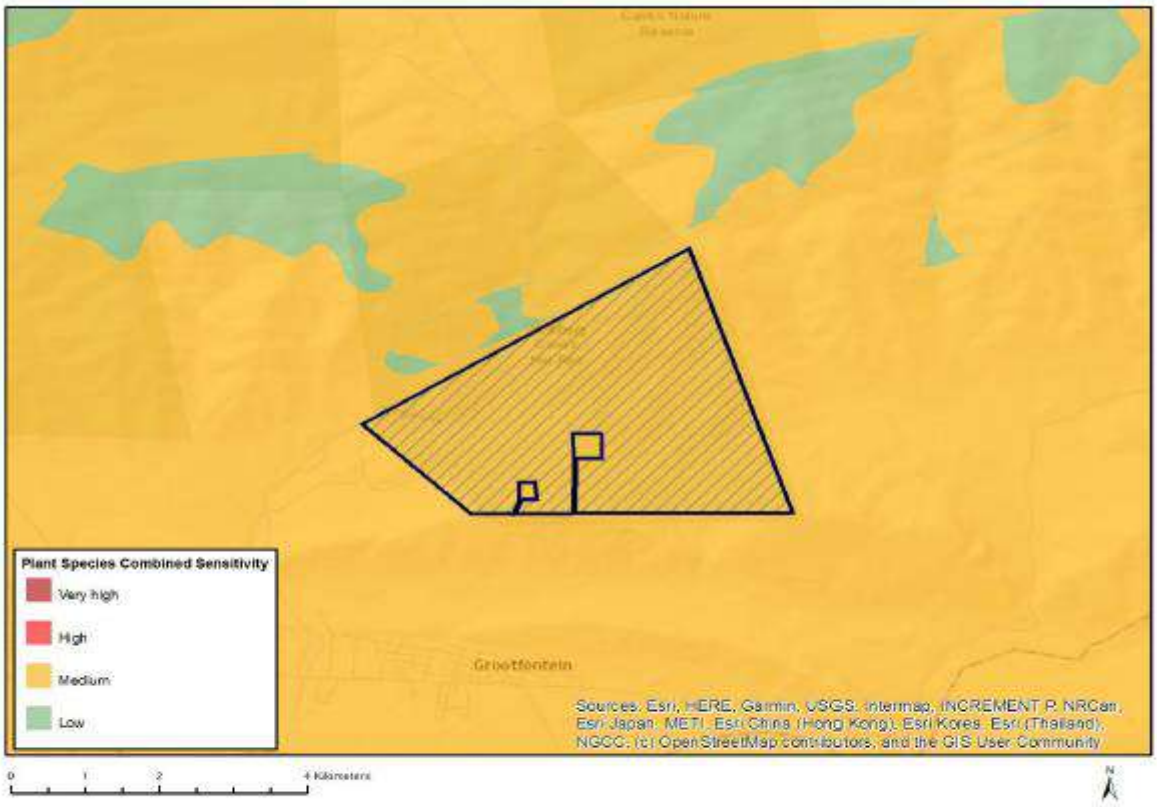
MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Figure 14: Map showing agricultural sensitivity theme source: screening report

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

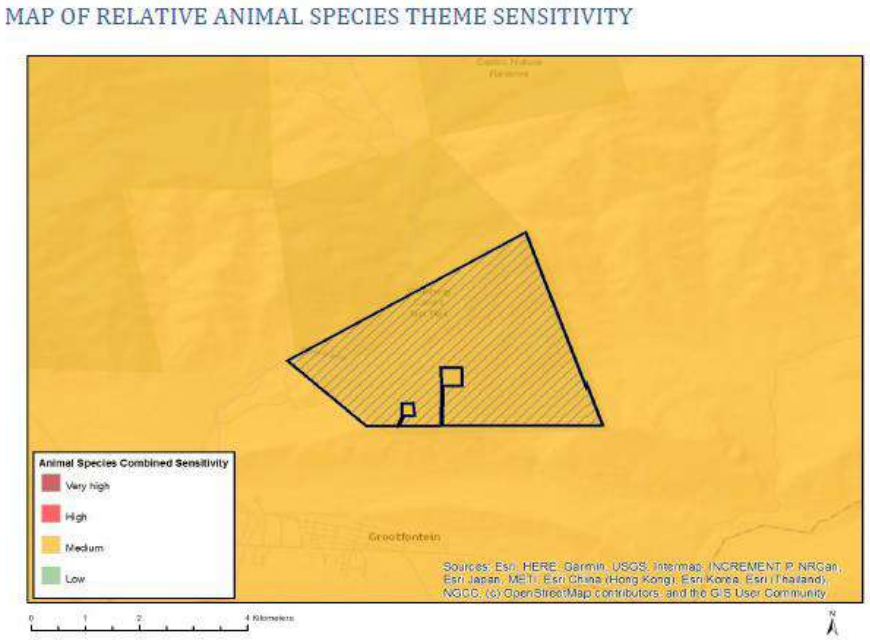


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Figure 15: Map showing plant species sensitivity theme source: Screening report

Figure 16: Pictures of plants observed on site

The development footprint environmental sensitivity for animal species as per screening report results showed the area to be of medium sensitivity with features including the Mammalia-Cercopithecus albogularis schwarzi, Insecta-Aloeides stevensoni, Insecta-Orachrysops regalis, Insecta-Pseudonympha swanepoeli, Insecta-Dingana clara, Sensitive species 13 and the Sensitive species 9. From the site assessment conducted, no domestic animals were observed within the proposed prospecting right area.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Figure 17: Map of relative animal species theme sensitivity source: screening report

6.4.2.6. Critical Biodiversity

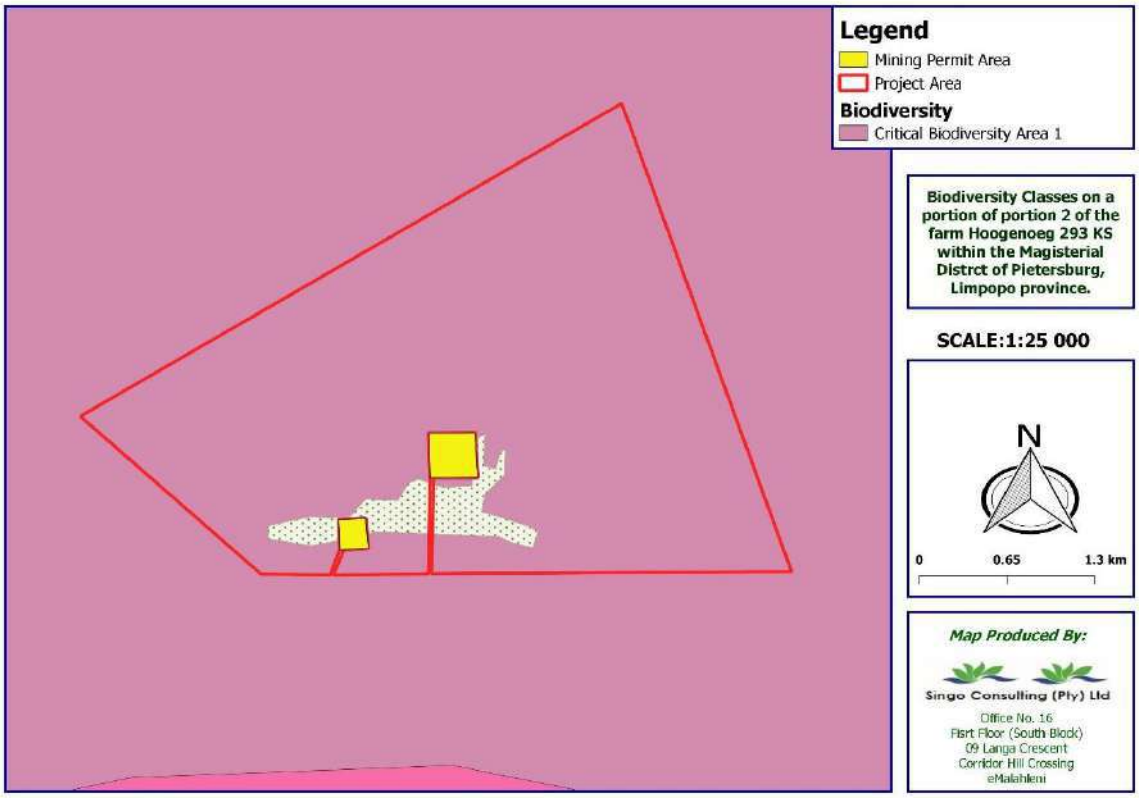
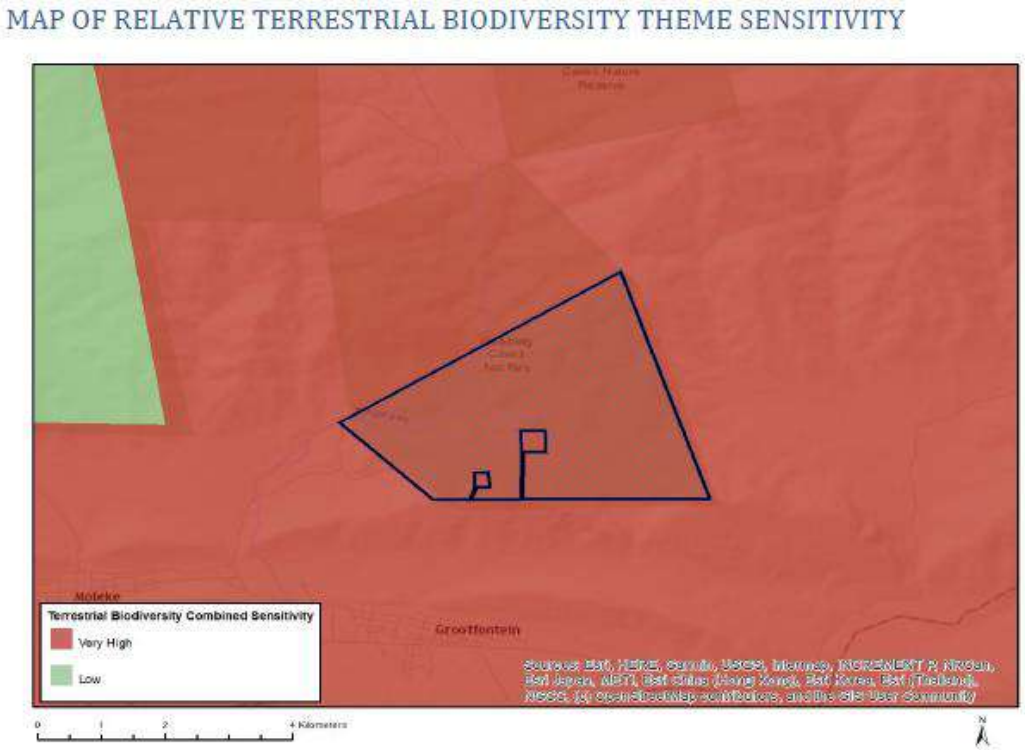


Figure 18: Biodiversity map of the project area



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Figure 19: Terrestrial Biodiversity Theme map of the project area source: screening report

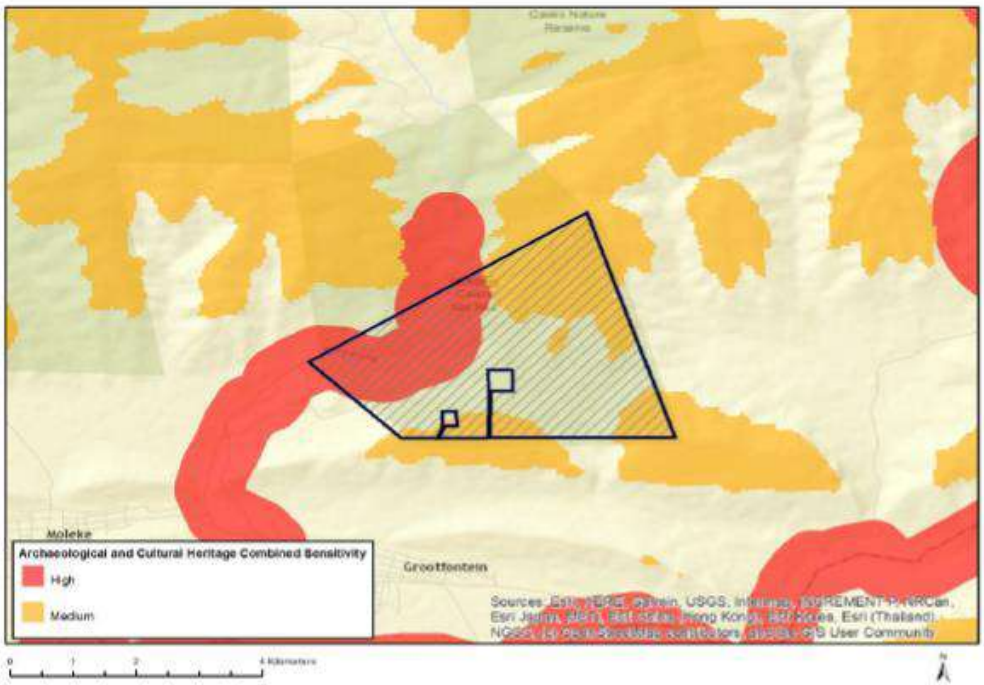
From the desktop study conducted on farm Hooggenoeg 293 KS, the proposed prospecting site is dominated by the Critical Biodiversity Area 1. This area can be described as the area that is irreplaceable for meeting biodiversity targets. There are no other options for conserving the ecosystems, species or ecological processes in these areas. This type of area is most important in maintaining the natural or near natural ecological condition.

According to the development footprint environmental sensitivity, the results for the Terrestrial biodiversity theme showed the area to have very high sensitivity, see ***Figure 19*** above. According to the results from the screening report, the area is classified within the Critical Biodiversity Area 1(CBA1) (this is the area that is irreplaceable for meeting biodiversity targets), Ecological Support Area 2 (ESA2), this is the area that supports the ecological functioning of protected areas or CBAs, they provide important ecological infrastructure. Other features in which the project area is classified within includes the focus areas for land-based protected areas expansion.

6.5 ARCHAEOLOGY CULTURAL AND HERITAGE

During site evaluation of the proposed prospecting site, no graves, cultural anf heritage artefacts were observed within the project area. According to the development footprint environmental sensitivity, the results for the Archaeological and Cultural Heritage theme showed the area to be of high sensitivity, see **Figure *20***. The results also showed the area to be within 500 m of an important river and a mountain or ridge exists within the site. Detailed surface water study and wetland study have been conducted for the proposed prospecting project. Recommendations in carrying out physical prospecting on the proposed project area have been identified, including the development of 100m buffer zone from the water resources contained within the farm area.

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Figure 20: Map showing Archaeological and Cultural Heritage sensitivity source: screening report

6.6. PALAEONTOLOGY

Palaeontology is the scientific study of life that existed prior to, and sometimes including, the start of the Holocene Epoch (roughly 11,700 years before present). It includes the study of fossils to classify organisms and study interactions with each other and their environments. Palaeontology lies on the border between biology and geology, but differs from archaeology in that it excludes the study of anatomically modern humans. It now uses techniques drawn from a wide range of sciences, including biochemistry, mathematics, and engineering.

Should fossils be observed during drilling or any assessments, the management of the project must be notified. Subsequently, the palaeontologist must be informed, and the fossils recovered according to SAHRA specifications. Quarterly assessment of the fossil on high walls and crushed material should be considered.

6.7. SENSITIVE RECEPTORS

The proposed property is situated near the Orrie Baragwanath Pass roas that passes on the southern side of the project area and extends from R37 (approximately 10.46 km South from the project area).

This sensitive receptor is considered in the formulation of the technical management options/mitigation measures employed to minimise, reduce, and mitigate against potential impacts.

Figure 21: Sensitive receptor observed on site

6.8. ENVIRONMENTAL ASPECTS WHICH MAY REQUIRE PROTECTION AND/OR REMEDIATION

Perennial rivers, non-perennial rivers, channelled valley bottom wetland and an unchannelled valley bottom wetland were identified within the boundaries of the proposed prospecting application area during the desktop assessment. The perennial river, Tongwane river exist within the farm area. In the absence of a national protocol, a generic 100m buffer will be established around the water courses on site. This 100m buffer is considered adequate from a water quality perspective in providing functional filtering capacity to the water course. This generic buffer has the potential to be reduced following a site-based level assessment and consideration of risk of proposed development and the proposed mitigation measure (NFEPA, 2011). Regulation 4 of GN704 of the NWA prohibits any underground or opencast mining,

prospecting or any other operation or activity under or within the 1:50 year flood-line or within a horizontal distance of 100 metres from any watercourse or estuary, whichever is the greatest.

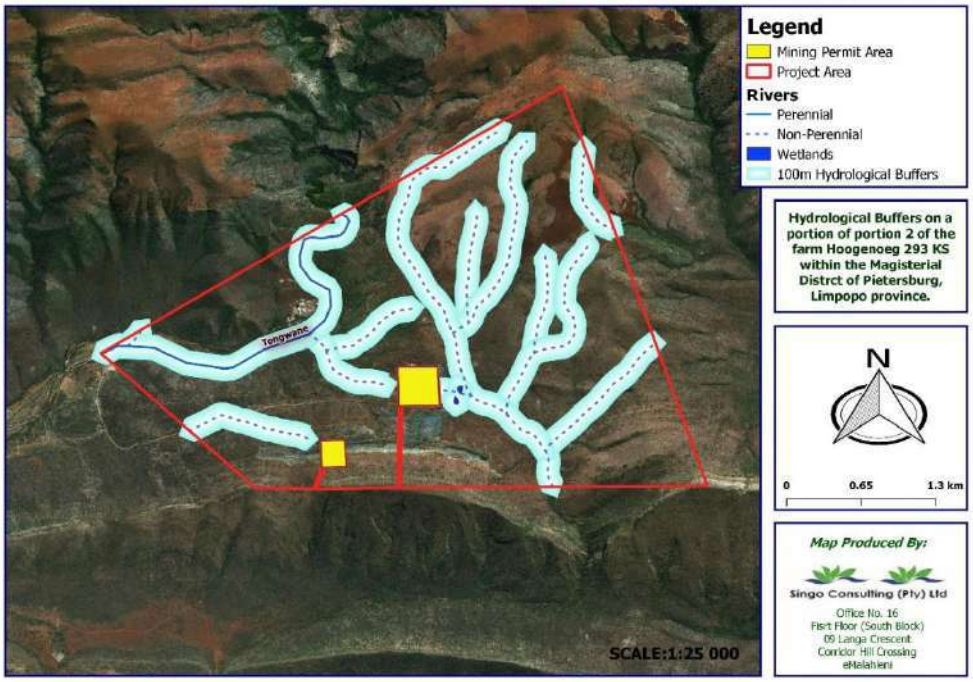


Figure 22: Buffer map of the project area

6.8.1. DESCRIPTION OF CURRENT LAND USES

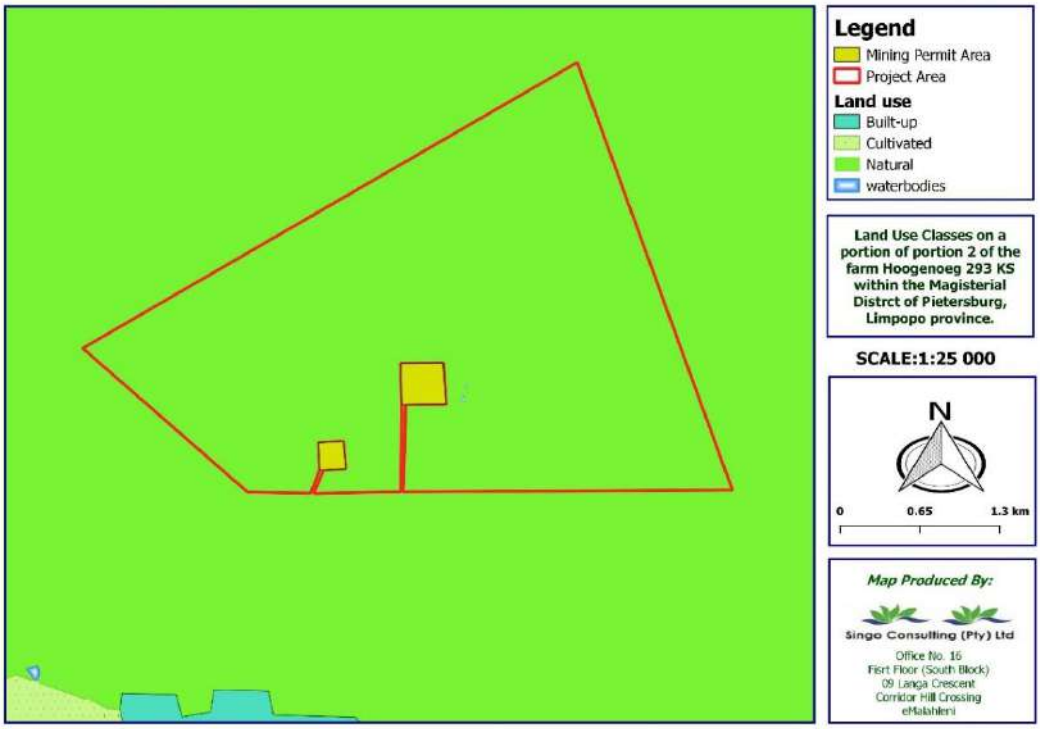


Figure 23: Land Use classes map of the project area

The proposed area is kept in its natural state as shown on the land use map on **Figure 23** above.

6.8.2. IMPACTS AND RISKS IDENTIFIED

In order to calculate the significance of an impact, probability, duration, extent and magnitude will be used. The pre- and post-mitigation scores will provide an indication of the extent to which an impact can be mitigated.

Due to the unavailability of historical geological data, both invasive and non-invasive prospecting techniques will be utilized. Activities that will require site access include Geological Field Mapping Semi-Regional Geophysical Survey, Detailed Ground and Aerial Geophysical Survey, Prospecting Boreholes, Boreholes to confirm continuity of mineralization & potential deposit size and Resource Definition Drilling.

Potential impacts that may occur as a result of the proposed prospecting activities are:

- Job Creation;
- Clearance/Disturbance of vegetation;
- Compacting of Soils;
- Drilling impact on identified lithic scatters;
- Deterioration and damage to existing access roads and tracks;
- Safety and security risks to landowners and lawful occupiers;
- Interference with existing land uses;
- Generation and disposal of waste;
- Contamination of surface and ground water;
- Introduction/invasion by alien species;
- Noise;
- Impact on faunal species;
- Pollution of Soils;
- Dust;
- Erosion due to vegetation clearance;
- Impact on surface water features;
- Impact on groundwater;
- Loss of fossil heritage.

6.9. THE IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations (2010). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring.

This determines the environmental risk. In addition, other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S).

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk
(ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$\underline{C = (E+D+M+R) \times N}$$

$$4$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in ***Table 6***:

Table 6: Criteria for determination of impact consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),

Intensity	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/scored as per ***Table 7***.

Table 7: Probability scoring

Probability	**1**	**Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),**
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

ER= C x P

Table 8: Determination of Environmental Risk

	5	5	10	15	20	25

Consequence						
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to

25. These ER scores are then grouped into respective classes as described in ***Table 9***.

Table 9: Significant classes

Environmental Risk Score	
Value	Description
< 10	Low (i.e. where this impact is unlikely to be a significant environmental risk),
≥ 10; < 20	Medium (i.e. where the impact could have a significant environmental risk),
≥ 20	High (i.e. where the impact will have a significant environmental risk).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/ mitigated.

In accordance with the requirements of Regulation 31 (2)(l) of the EIA Regulations (GNR 543), and further to the assessment criteria presented above it is necessary to assess each potentially significant impact in terms of:

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

In addition, it is important that the public opinion and sentiment regarding a prospective development and consequent potential impacts is considered in the decision making process.

In an effort to ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority / significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/ mitigation impacts are implemented.

Table 10: Criteria for the determination of prioritisation

Public response (PR)	Low (1)	Issue not raised in public response.
	Medium (2)	Issue has received a meaningful and justifiable public response.
	High (3)	Issue has received an intense meaningful and justifiable public response.
Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable loss resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in ***Table 10***. The impact priority is therefore determined as follows:

Priority = PR + CI + LR

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (refer to ***Table 11***).

Table 11: Determination of Prioritisation Factor

Priority	Ranking	Prioritisation Factor

3	Low	1
4	Medium	1.17
5	Medium	1.33
6	Medium	1.5
7	Medium	1.67
8	Medium	1.83
9	High	2

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is to be able to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential, significant public response, and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 12: Environmental significance rating

Environmental Significance Rating	
Value	**Description**
< -10	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥ -10 < -20	Medium negative (i.e. where the impact could influence the decision to develop in the area).
≥ -20	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).

0	No impact
< 10	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥ 10 < 20	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 20	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

7. THE POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED

The proposed prospecting activities to be undertaken include the use of both invasive and non-invasive prospecting techniques. There will therefore be physical disturbance to the application area although this disturbance will be limited to the identified borehole sites and not the entire application area. Another negative impact of the proposed activity would be the interference with landowners or communities and the existing land uses. The actual invasive work only covers a few properties within the application area itself and therefore the disturbance due to invasive work will be minimal.

The positive impact of the proposed activity is the discovery of an economically viable mineral resource within the Lepelle-Nkumpi Local Municipality, whose economy is very dependent of the mining industry.

It should be noted that this report made available to I&AP's for review and comment and their comments and concerns will be taken into account in this BAR & EMPr. Furthermore, it should be noted that the impact scores themselves will include the results of the public response and comment. Please refer to Section 6.9 for the Methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks.

The following provides a description and assessment of the potential impacts identified in the impact assessment process. Please refer to Section 29.4 for the full impact scoring calculations. The topographical and geophysical surveys will see an increase in the use of access tracks by vehicles driving around the site. The access roads may over time and continuous use deteriorate and become damaged. The potential exists for a group of unfamiliar workers to enter the project area during the prospecting activities. This impact could potentially affect the local communities, however the impact will be minimal as people on site will be limited to the Applicant, contractor and geologists for the topographical and geophysical surveys.

Access to the application area for the topographical and geophysical survey, prospecting drilling and resource definition drilling will be required which may interrupt the existing land uses, such as grazing and residential developments. However, this impact will be minimal as it is of short duration. Approximately 0,9 ha of vegetation will be cleared during prospecting, however, care will be taken to be ensure that any protected species identified are relocated outside the footprint of the prospecting activities. Provisions have been made for the rehabilitation of all areas disturbed during prospecting, including access tracks.

The prospecting activities will generate general waste during the construction/ operational phase. This waste must be collected during site visits to be disposed of at appropriate landfill sites.

Impact	Pre-Mitigation Score
Job Creation	+5.25
Impact	**Pre-Mitigation Score**
Clearance/Disturbance of vegetation	-8.00
Compacting of Soils	-5.25
Drilling impact on identified lithic scatters	-8.00
Deterioration and damage to existing access roads and tracks	-8.00
Safety and security risks to landowners and lawful occupiers	-6.00
Interference with existing land uses	-7.00
Generation and disposal of waste	-6.00
Contamination of surface and ground water	-8.25
Introduction/invasion by alien species	-6.00
Noise	-4.50
Impact on fauna	-6.75
Pollution of Soils	-4.50
Dust	-4.50

Erosion due to vegetation clearance	-5.25
Impact on surface water features	-6.00
Impact on groundwater	-6.00
Loss of fossil heritage	-3.50

8. THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK

The following sections provide a description and assessment of the mitigation measures for each potential impact identified in the impact assessment process. The impact scores below are reflective of the impacts post the implementation of mitigation measures. A second score indicating the final significance of each potential impact is also reflected below. This score indicates the degree of potential loss of irreplaceable resources, the cumulative nature of the impact, as well as the degree of public concern regarding the impact. It should be noted that this report will be made available to I&AP's for review and comment and their comments and concerns will be addressed in the final report to be submitted to the DMRE for adjudication. Furthermore, it should be noted that the impact scores themselves will include the results of the aforementioned public response and comment. The results of the public consultation will be used to update the impact scores upon completion of the public review period, where after the finalised report will be submitted to the DMRE for adjudication.

The following mitigation types have been associated with the potential impacts identified:

- Avoid and control through implementation of EMPr mitigation measures (e.g. speed limit enforcement, vehicle maintenance);
- Avoidance and control through preventative measures (e.g. site security, code of conduct);
- Remedy through application of mitigation measures in EMPr;
- Avoid and control through implementation of preventative measures (e.g. monitoring, communication with landowners, emergency response procedures);
- Avoid through implementation of preventative measures (e.g. consultation and communication);
- Avoid and remedy impacts and risks to the community through ongoing communication with the community. In this regard, quarterly community meetings shall be held with the affected communities.

- Avoid through implementation of suitable progressive rehabilitation and soil management;
- Avoid and control through implementation of EMPr mitigation measures (e.g. Spill prevention, Hydrocarbon Storage);
- Avoid through preventative measures (e.g. bunding, spill kits);
- No invasive prospecting activities to be undertaken within 100m of a watercourse.
- Should any watercourse be affected, then the necessary water use licences should be obtained from the Department of Water and Sanitation.
- No ablution of site laydown areas is to be located within 100m of a watercourse.
- Where shallow aquifers are encountered, a survey of the drinking water/ livestock watering boreholes should be undertaken (within 100 m of the prospecting borehole sites). A detailed groundwater monitoring programme should be developed for these drinking water/ livestock watering boreholes and pre- and post-prospecting water quality samples should be taken.
- Where drinking water/ livestock watering boreholes are to be affected then the advice of a geohydrologist should be sought with regards to the need for plugging and casing of the prospecting boreholes.
- Remedy through clean-up and waste disposal; and
- Avoid and control through implementation of preventative measures (e.g. location of toilets, spill prevention, waste management).

Impact	Post-Mitigation Score	Final Significance
Job Creation	+5.25	+5.25
Clearance of vegetation	-7.00	-7.00
Compacting of Soils	-3.75	-3.75
Drilling impact on identified lithic scatters	+3.75	+4.38
Deterioration and damage to existing access roads and tracks	-5.00	-5.00

Safety and security risks to landowners and lawful occupiers	-4.00	-4.00
Interference with existing land uses	-5.00	-5.83
Generation and disposal of waste	-4.50	-4.50
Contamination of surface and ground water	-3.50	-4.08
Introduction/invasion by alien species	-3.00	-3.00
Noise	-2.50	-2.50
Impact on fauna	-6.00	-7.00
Pollution of Soils	-2.50	-2.50
Dust	-2.50	-2.50
Erosion due to vegetation clearance	-2.50	-2.50
Impact on surface water features	-3.50	-3.50
Impact on groundwater	-3.50	-3.50
Loss of fossil heritage	-3.25	-3.25

9. MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

Since exploration is temporary in nature, no permanent structures will be constructed. Negotiations and agreements will be made with the farm owners to use any existing infrastructure like access roads. The location of the property is in an area where the geological formation that is known to host the desired mineralisation.

10. STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE

The proposed project area as discussed above, has been selected due to the geology of the site and the anticipated favourable tectono-stratigraphic setting of the proposed prospecting area. No prospecting activities will occur within 100m from the watercourses. The land or properties affected are mostly remain unused and as a result, the potential discovery of viable mineral resources within the proposed project area would be beneficial in terms of diversifying the use of land in the area. Negative impacts identified above will be mitigated through implementation of the proposed mitigation measures as detailed in the EMPr. Where negative impacts cannot be avoided, rehabilitation will be undertaken.

The impacts of the development alternative are considered of medium to low significance and would be further reduced to low should the implementation of the proposed mitigation measures be done accordingly.

11. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY

The impact assessment process may be summarised as follows:

• Landowner and stakeholder consultation Environmental assessment conducted for neighbouring projects

• 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 the various environmental considerations. The desktop investigation involved the use of:
-South African National Biodiversity Institute (SANBI) Biodiversity
-Geographic Database LUDS system

-Geographic Information System base maps
-Municipal Integrated Development Plan and Spatial Development Framework.

- The site visit was used to ground truth the desktop information.

- The rating of the identified impacts was undertaken in a quantitative manner as provided in this document. The ratings are 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 actual views.

- The identification of management measures is done based on the significance of the impacts and measures that have considered appropriate and successful, specifically as Best Practical and Economical Options.

11.1. IMPACT ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

Table 13: Impact Assessment Summary

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Geological Field Mapping and Environmental Screening	Interference with existing land uses	Site Access	Planning	-7.00	Site access control, heritage impact assessment; consultation with Landowners	-8.17
	Deterioration and damage to existing access roads and tracks	Transportation	Planning Operation	-8.00	Site access control; Demarcation of access tracks to be used	-5.00
Regional Ground Geophysical Surveys and Detailed Ground Geophysical Surveys	Interference with existing land uses	Site Access	Planning	-7.00	Site access control, heritage impact assessment; consultation with Landowners	-5.83
	Deterioration and damage to existing access roads and tracks	Transportation	Planning Operation	-8.00	Site access control; Demarcation of access tracks to be used	-5.00
Site Clearance	Clearance of vegetation	Prospecting areas	Construction	-8.00	Demarcation of sensitive areas in consultation with	-7.00

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
			Operation		relevant specialists and ECO; •Minimise removal of vegetation as far as possible; •Implement alien vegetation management; •Ongoing identification of risks and impacts; •Emergency preparedness; and •Monitoring and review.	
	Erosion due to vegetation clearance	Prospecting areas	Construction Operation	-2.50	•Limit construction to approved demarcated areas. •Rehabilitation using indigenous seed mix.	-2.50
	Impact on surface water features	Prospecting areas	Construction	-3.50	• No prospecting drill site to be located within	-3.50

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE in which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated

					100m of watercourse. Implementation of pollution prevention mitigation measures.	
		Drilling impact on identified lithic scatters	Prospecting areas	Construction Operation	-1.75	Notification of Provincial and National Heritage Authorities	+1.00
		Impact on Hooggenoeg 293 KS	Construction	Construction Operation	-2.00	• Notification of Provincial and National Heritage Authorities • Temporary heritage signage during the construction (drilling) phase	+1.00

		Pollution of Soils	Prospecting areas	Construction Operation	-4.50	• All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner so as to prevent pollution of the environment or harm to people. • Appropriate measures must be taken to prevent spillage & appropriate steps must be taken should spillage occur to prevent pollution • Hazardous substance must be confined to specific and secured areas, and	-2.50

						stored at all times within bunded areas. • Adequate spill prevention and clean-up procedures should be developed and implemented during the prospecting activities. Should any • major spills of hazardous materials take place; such should be reported in terms of the Section 30 of the NEMA.	
NAME OF ACTIVITY	**POTENTIAL IMPACT**	**ASPECTS AFFECTED**	**PHASE in which impact is anticipated**	**SIGNIFICANCE if not mitigated**	**MITIGATION TYPE**		**SIGNIFICANCE if mitigated**

		Introduction/ invasion by alien species	Prospecting areas	Construction Operation Rehabilitation	-6.75	Use of indigenous species for rehabilitation, immediate rehabilitation of areas where construction is completed, rehabilitation monitoring.	-3.00
		Dust	Prospecting areas	Construction Operation	-4.50	• Use of suitable dust suppression measures such as water spraying; • All stockpiles of fine material must be covered; • Limit clearance of vegetation.	-2.50
		Interference with existing land uses	Site Access	Planning Construction Operation	-7.00	Site access control, heritage impact assessment; consultation with Landowners	-5.83

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated

Target Prospecting Boreholes & Widely Spaces Boreholes	Pollution of Soils	Drilling	Construction Operation	-4.50	• All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner so as to prevent pollution of the environment or harm to people or animals. • Appropriate measures must be implemented to prevent spillage and appropriate steps must be taken to prevent pollution	-2.50

					in the event of a spill; and way that does not pose any danger of pollution even during times of high rainfall. • Hazardous substances must be confined to specific and secured areas, and stored at all-time within bunded areas; • Adequate spill prevention and clean-up procedures should be developed and implemented during the prospecting activities. • Should any major spills of hazardous materials take place, such should be reported in terms of the Section 30 of the NEMA.	
	POTENTIAL IMPACT	**ASPECT AFFECTED**	**PHASE**	**SIGNIFICANCE if not mitigated**	**MITIGATION TYPE**	**SIGNIFICANCE if mitigated**

		Compacting of Soils	Drilling	Construction Operation Decommissioning	-5.25	Compacting of soil must be avoided as far as possible, and the use of heavy machinery must be restricted in areas outside of the proposed exploration sites to reduce the compaction of soils.	-3.75
		Surface Water	Drilling	Construction Operation Decommissioning	-6.00	• No invasive prospecting activities to be undertaken within 100m of a watercourse. • water use licences is applied to the Department of Water and Sanitation.	-3.50

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECT AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated

		Groundwater	Drilling	Construction Operation Decommissioning	-6.00	Where shallow aquifers are encountered, and a pollution event occurs at a particular borehole, a survey of the drinking water/ livestock watering boreholes should be undertaken (within 5km of the prospecting borehole sites). A detailed development of groundwater monitoring programme for these drinking water/ livestock watering boreholes and pre- and post-prospecting water quality samples should be taken	-3.50
NAME ACTIVITY	**POTENTIAL IMPACTS**		**ASPECTS AFFECTED**	**PHASE**	**SIGNIFICANCE if not mitigated**	**MITIGATION TYPE**	**SIGNIFICANCE if mitigated**

		Noise	Drilling	Construction Operation	-3.75	landowners and directly adjacent landowners should be notified of any potentially noisy activities or work and these activities should be undertaken at reasonable times of the day. The contractor must attempt to restrict noisy activities as far as is possible to times and locations whereby the potential for noise nuisance is reduced.	-2.50
NAME ACTIVITY	**POTENTIAL IMPACTS**		**ASPECTS AFFECTED**	**PHASE**	**SIGNIFICANCE if not mitigated**	**MITIGATION TYPE**	**SIGNIFICANCE if mitigated**

		Loss of fossil heritage	Drilling	Construction Operation	-3.25	• Should by any chance fossils be uncovered during the construction phase, these must be handled in accordance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA); and ECO should alert SAHRA so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional palaeontologist	-3.25

NAME OF ACTIVITY	POTENTIAL IMPACTS	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated

		Impact on faunal species	All prospecting activities	Construction Operation	-2.50	All incidents of harm to any natural vegetation (apart from the agreed upon areas) or animals must be reported to the ECO. • Harvesting or poaching of animals and plants is forbidden. • No food of the construction workers should be left open and unattended as the likelihood of animals taking the food is high. This process disturbs ecological processes and is therefore strictly forbidden. •	-2.50
NAME OF ACTIVITY		**POTENTIAL IMPACTS**	**ASCPECTS AFFECTED**	**PHASE**	**SIGNIFICANCE if not mitigated**	**MITIGATION TYPE**	**SIGNIFICANCE if mitigated**

Ablutions - Chemical Toilets	Contamination of surface waters	All prospecting activities	Construction Operation	-6.75	• Provision of adequate chemical toilets on site, chemical ablutions to be emptied regularly. • Chemical ablutions must not be placed in close proximity to watercourses.	-4.08
Temporary Fuel storage	Pollution of Soils	Drilling	Construction Operation	-4.50	• Any spills of hydrocarbons or fluids used during operation, must be cleaned up immediately; • An above ground drilling sump must be used to	-2.50

NAME ACTIVITY	POTENTIAL IMPACTS	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated

						contain drilling mud in order to reduce surface and groundwater contamination. No earthen mud sumps are to be constructed and utilized; • Soils in drilling areas where disturbances will be encountered must be stripped and stockpiled outside affected areas for use after completion of the drilling program. • Topsoil must be adequately stripped to the correct depth and stored separately from subsoils;	
NAME ACTIVITY	**POTENTIAL IMPACTS**	**ASPECTS AFFECTED**	**PHASE**	**SIGNIFICANCE if not mitigated**	**MITIGATION TYPE**		**SIGNIFICANCE if mitigated**

		Contamination of Surface and Ground water	Drilling	Construction Operation	-8.25	• No prospecting boreholes may be located within 100m of a watercourse • Cut of trench and berm must be constructed around the drill pad to prevent contaminated surface runoff from entering shallow aquifers and surrounding water resources, where required by the topography; • A liner should be placed over the drill pad and drip trays must be used in all areas where hydrocarbons are handled;	-4.08

NAME OF ACTIVITY	POTENTIAL IMPACTS	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated

Creation of access roads	Disturbance/ Clearance of vegetation	Transportation	Construction Operation	-8.00	• No indiscriminate driving in natural areas. • Use of existing access tracks wherever possible. • Rehabilitation of any disturbed areas due to prospecting.	-7.00
Undertake rehabilitation as per the annual and final Rehabilitation plan	Introduction/invasion by alien species	Rehabilitation	Operation Rehabilitation	-6.75	Only indigenous plant species must be used during revegetation of disturbed areas through a plant specialist • Restoration and Rehabilitation must be implemented as soon as the prospecting activities are completed	-3.00
NAME OF ACTIVITY	**POTENTIAL IMPACTS**	**ASPECTS AFFECTED**	**PHASE**	**SIGNIFICANCE if not mitigated**	**MITIGATION TYPE**	**SIGNIFICANCE if mitigated**

					• Sites must be restored to the original condition with vegetation cover • Natural drainage patterns must be restored • All surface infrastructure must be removed • Temporary access roads/tracks must be suitably rehabilitated • Sites must be monitored by the relevant ECO for adequate rehabilitation and until rehabilitation desired is achieved.	
NAME OF ACTIVITY	**POTENTIAL IMPACTS**	**ASPECTS AFFECTED**	**PHASE**	**SIGNIFICANCE if not mitigated**	**PHASE**	**SIGNIFICANCE if mitigated**

Monitoring of rehabilitation efforts	Erosion due to vegetation clearance	Closure and Rehabilitation	Rehabilitation Post-rehabilitation	-5.25	The post operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority. where required. Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.	-2.50

9. SUMMARY OF SPECIALIST REPORTS

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Hydrological study	○ Surface water impacts from the site can be effectively mitigated by applying best practice water management principles. ○ The success of surface water impact management will be judged on the basis of successful prevention of spills from the site. ○ Drilling activity should not be conducted near these water resources, the exploration geologists will be advised to drill and sample away from rivers and wetlands on site. ○ All the wetlands and non-perennial streams will be buffered as "no go" area preferably a 100m buffer will apply.	**X**	Section 6.4.2.4 Appendix 9
Hydrogeological study	○ Prevention of pollution of surface water resources and impacts on other surface water users by training of workers to prevent pollution, equipment and	**X**	Section 6.4.2.4 Appendix 9

	vehicle maintenance, fast and effective clean-up of spills, effective waste management, manage clean and dirty water in accordance. o Drilling activity should not be conducted near these water resources, the exploration geologists will be advised to drill and sample away from non-perennial rivers and wetlands on site. o Extreme caution should be taken during prospecting, owing to the non- perennial rivers, dam and numerous wetlands existing within and nearby the project area. No washing of any mechanical equipments or vehicles will be allowed near the water resources. o All the wetlands and non-perennial rivers will be buffered as no go area preferably a 100m buffer will apply o Absorbent Spill kits must be made available near the drill rigs during drilling activities. The oil absorbent chemicals will ensure that no oils infiltrate down to the underground to cause any groundwater contamination. o The core logs of boreholes with mineral of interest should be cleared from the ground		

	immediately after logging by the geologists to prevent washing and leaching to the water resources during rainfall		
Soil study	o Limit impacts to the footprints to keep physical impacts as small as possible. Areas for road, site lay-out should be minimized, dust generation. o The proposed prospecting land should be returned to its origin as before prospecting activities and the rehabilitation performance assessment in the proposed land must be done concurrently. o No washing of any mechanical equipments or vehicles should be allowed 100 m from the water resources. o	**X**	Section 6.4.2.3. Appendix 9

Please refer to appendix 9 for the complete specialist reports.

12. ENVIRONMENTAL IMPACT STATEMENT

12.1. SUMMARY OF KEY FINDINGS

A summary of the key findings of the environmental impact assessment is outlined below.

Key findings for the Basic Assessment:

- The possible environmental impacts associated with the proposed prospecting are considered insignificant. A diamond core drill rig will be used for drilling.
- There are impacts associated with the water courses that is located onsite. The proposed prospecting area falls within the Olifants Water Management Area, within the quaternary catchments B71A and B71B.
- The proposed prospecting area falls within the Critical Biodiversity Areas 1.

Key findings for the socio-economic environment:

- The proposed farm area is owned by the Lepelle-Nkumpi local municipality as according to the deed search results obtained from the Windeed search.
- There is a traditional council which is in charge of the farm area. Kgoshi Mathabatha on behalf of the Mathabatha Traditional Council is not in objection of the proposed prospecting right application.
- Consultation with the land owners was conducted in order to capture any comments or concerns regarding the proposed activities and to ensure that the landowners are kept informed and allowed to raise issues.

12.2. FINAL SITE MAP

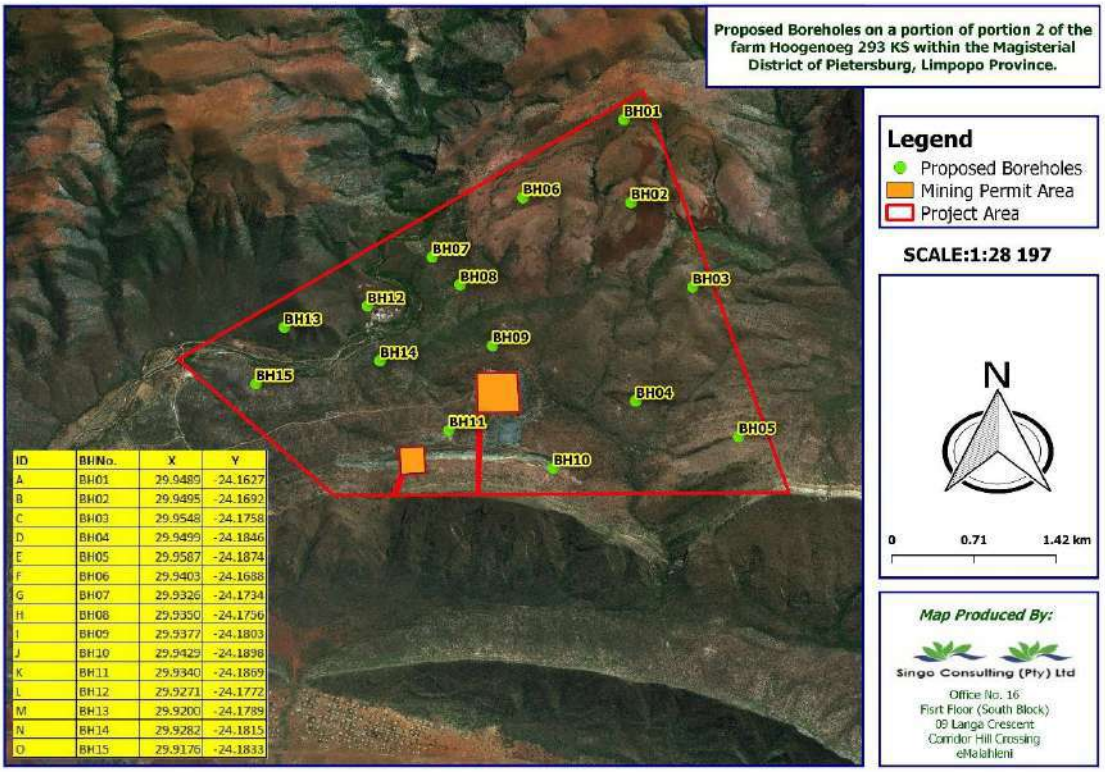


Figure 24: Proposed borehole map of the project area.

12.3. SUMMARY OF POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS

The positive implication of the Prospecting Right is the discovery of an economically viable mineral resource. Although non-invasive techniques will be utilized as part of the proposed prospecting activities. The implementation of the proposed mitigation measure will ensure that the negative implications and risks of the project are minimal.

The Potential positive impacts are as follows:

- Discovery of an economically viable mineral resources
- Employment contributing to the economy
- Positive contribution to the South African Gross Domestic Product
- Concurrent rehabilitation during prospecting

The potential negative impacts are as follows:

- Clearance/Disturbance of vegetation;
- Compacting of Soils;
- Drilling impact on identified lithic scatters;
- Deterioration and damage to existing access roads and tracks;

- Safety and security risks to landowners and lawful occupiers;
- Interference with existing land uses;
- Generation and disposal of waste;
- Contamination of surface and ground water;
- Introduction/invasion by alien species;
- Noise;
- Impact on faunal species;
- Pollution of Soils;
- Dust;
- Erosion due to vegetation clearance;
- Impact on surface water features;
- Impact on groundwater;
- Loss of fossil heritage.

The EMPr has identified appropriate mechanisms for avoidance and mitigation of these negative impacts.

13. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND OUTCOMES

The management objective is to minimise the socio-economic impact of the proposed Prospecting Right in terms of the socio-economic perceptions and expectations of I&AP's. The outcome to be achieved is to lessen the impact through the following measures:

- Adhere to an open and transparent communication procedure with stakeholders at all times;
- Ensure that accurate information regarding the prospecting activities to be undertaken and the resultant lack of requirements for site access and labour is communicated to I&APs;
- Ensure that information is communicated in a manner which is understandable and accessible to I&APs;
- Enhance project benefits and minimise negative impacts through consultation with stakeholders;
- To limit interference with existing land uses as far as possible during prospecting;
- Limit the impact on the groundwater and surface water features through the implementation of the EMPr and the impact mitigation measures.
- To avoid damage to road infrastructure; and
- To maintain safety to pedestrians and motorists.

14. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

- Option 1: No prospecting activities should take place within 100m of any watercourses within the project area.

The Landowner should be engaged at least 1 month prior to any site activities being undertaken once drill sites are known; and a map detailing the drilling locations should be provided to the landowner as well as the DMRE prior to commencement of prospecting activities.

15. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The following assumptions, uncertainties, and gaps in knowledge are applicable to this BAR & EMPr:

The location of drill sites is not yet known and will be identified through the phased approach of the prospecting programme. This assessment is therefore based on a desktop approach at a broad scale and assuming that drilling could occur within the proposed Prospecting Right area. Once drill sites have been identified, then it is recommended that focus should be given to these sites in order to identify any cultural or heritage resources of significance, any ecologically significant areas that may occur as well as re-engaging land owners regarding the intention to access and conduct drilling activities on their property.

16. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

16.1. REASONS WHY THE ACTIVITY SHOULD BE AUTHORISED OR NOT

It is the opinion of the EAP that the proposed activity should be authorised with reasons that the economy of the Lepelle-Nkumpi remains still, thus the high number of youth will remain unemployed and unskilled. The prospecting activities do not compete with any current land use since large portion of it remains vacant and undisturbed. Furthermore, the impacts on the environment can be mitigated through open communication and transparency with the landowners and the lawful occupiers, implementation of the proposed EMPr provisions including the decommissioning, closure and rehabilitation plans, and limiting site access requirements.

16.2. CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

Stakeholder Engagement will continue throughout the prospecting activities to ensure the community and landowners are kept informed and allowed to raise issues. These issues will then be addressed through a grievance mechanism.

Arrangements for financial provisions for the decommissioning, closure and rehabilitation must be made.

The applicant should adhere to the conditions of the EA, EMPr and the Specialist reports for this project.

17. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The Environmental Authorisation is required for five (5) years.

18. UNDERTAKING

It is confirmed that the undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the BAR and the EMPR.

19. FINANCIAL PROVISION

A financial provision of approximately **R43 474** which includes rehabilitation activities will be made available by DC Ore Minerals and Energy. See **Table *14*** for financial provision.

Table 14: Financial provision

CALCULATION OF THE QUANTUM

Applicant: DC Ore Minerals and Energy
Evaluator: Deshney Mapoko
Ref No.: LP 30/5/1/1/2/13799 PR
Date: Jan-21

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 powerlines)	m3	0	16	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	228	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	336	1	1	0
3	Rehabilitation of access roads	m2	300	41	0,03	1	369
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	395	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	216	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	455	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	238697	1	1	0
7	Sealing of shafts adits and inclines	m3	0	122	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	159131	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	198195	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	575653	1	1	0
9	Rehabilitation of subsided areas	ha	0	133249	1	1	0
10	General surface rehabilitation	ha	0,9	126059	0,3	1	34035,93
11	River diversions	ha	0	126059	1	1	0
12	Fencing	m	0	144	0,5	1	0
13	Water management	ha	0	47931	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	16776	1	1	0
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		34404,93

1	Preliminary and General	4128,5916	weighting factor 2 1	4128,5916
2	Contingencies	3440,493		3440,493
			Subtotal 2	41974,01
			VAT (15%)	1500,15
			Grand Total	43474

SIGN
DATE
Deshney Mapoko
2021/01/16

19.1. EXPLAIN HOW THE AFORESAID AMOUNT WAS DERIVED

This information has been provided in the Prospecting Work Programme that was submitted to the DMRE. The drilling contractor will be responsible for rehabilitating the drill pad once the drilling activities have been completed at each exploration hole. The financial guarantee was calculated using the DMRE official financial quantum calculator.

19.2. CONFIRM THAT THIS AMOUNT CAN BE PROVIDED FOR FROM OPERATING EXPENDITURE

DC Ore Minerals and Energy herewith confirms both its capacity and willingness to make the financial provision required should the prospecting right be granted. Work will be approved on a phase by phase basis, dependent on the results obtained in the previous phase i.e. although prospecting work may be provided for

financially in the budget for a specific year, it will only take place if justified. The amount is also reflected in the Prospecting Work Programme submitted to the DMRE.

20. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional information other than the appendices of this report has been included.

20.1. 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 BAR REPORT MUST INCLUDE THE:

20.1.1. IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON

The potential impacts on the socio-economic conditions have the potential to include:

- Safety and security risks to landowners and lawful occupiers

  The potential exists for a group of unfamiliar workers to enter the project area during the prospecting activities. This impact could potentially affect the local communities, however the impact will be minimal as people on site will be limited to the Applicant, contractor and geologists for the topographical and geophysical surveys.

- Interference with existing land uses

  Access to the application area for the topographical and geophysical survey will be required which may interrupt the existing land uses, such as livestock grazing, residential developments and game activities. However, this impact will be minimal as no heavy equipment will be brought on site and it is of short duration.

The consultation process will allow directly affected parties to raise their concerns. Further to this, it must be noted that I&AP's, including directly affected parties such as landowners, have the opportunity to review and comment on this report. The results of the public consultation have been included in the final report submitted to the department for adjudication.

20.1.2. IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT

Whilst heritage resources have been identified within the proposed prospecting area care will be taken to avoid any sensitive heritage resources that have been identified during Prospecting. Proposed boreholes will be moved to avoid all heritage features. If fossils or graves are discovered, the relevant

authorities will be immediately notified and drilling will be stopped in this area. The area does have protected areas, threatened ecosystems or critical biodiversity, and no sensitive parts will be negatively affected by the drilling procedures owing to the small scale of the prospecting activity.

21. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT

The proof of investigations conducted is attached as appendix.

PART B:

ENVIRONMENTAL MANAGEMENT PROGRAMME

20. INTRODUCTION

20.1. DETAILS OF THE EAP

The details and expertise of the EAP are detailed in Section 1 above as required.

20.2. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

A description of the aspects of the activity covered by the EMPR below is included in Section 2 above.

21. DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

21.1. DETERMINATION OF CLOSURE OBJECTIVES

The vision, and consequent objective and targets for rehabilitation, decommissioning and closure, aim to reflect the local environmental and socio-economic context of the project, and to represent both the corporate requirements and the stakeholder expectations.

The receiving environment within which the prospecting activities will be undertaken include the following key land-uses:

- Natural Veld primarily utilised for livestock grazing;
- Low density rural residential.

With reference to Section 6.2, concerns raised by the stakeholders consulted during the public participation process for the basic assessment have been taken into consideration and will be included in the final BAR and EMPr which will be submitted to the DMRE.

In practice the post closure land-use will depend on the pre-prospecting land-use applicable to the specific location of the invasive prospecting activities. Considering that the exact locations of the planned prospecting have been identified and assessed, it can be said that the closure plan will sufficiently address the objectives for the preferred alternative. This EMPr does, however, aim to address the key closure objectives which are likely to remain consistent for the majority of the prospecting activities.

The EMPr includes a rehabilitation plan. The plan shall outline the closure objectives which are aimed at reinstating the landform, land use and vegetation units to the same as before prospecting operations take place unless a specific, reasonable alternate land use is requested by the landowner. As such, the intended end use for the disturbed prospecting areas and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate. The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to prospecting. This shall be achieved with a number of specific objectives.

1. **Making the area safe.** i.e. Decommission prospecting activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, sealing boreholes, etc.
2. **Recreating a free draining landform.** This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.
3. **Re-vegetation.** This involves either reseeding or allowing natural succession depending on the area, climate etc.
4. **Storm water management and erosion control.** Management of storm water and prevention of erosion during rehabilitation. E.g. cut off drains, berms etc. and erosion control where required.
5. **Verification of rehabilitation success.** Entails monitoring of rehabilitation.
6. **Successful closure.** Obtain closure certificate.

21.2. VOLUMES AND RATE OF WATER USE REQUIRED FOR THE OPERATION

Limited water will be consumed by the surface dust suppression activities (water mist added for dust suppression when required). If diamond drilling is to take place, then it is estimated that up to 20 000 litres per day could be required.

21.3. HAS A WATER USE LICENCE BEEN APPLIED FOR?

No prospecting activity will occur within identified watercourses.

21.4. IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Table 15: Impacts to be mitigated

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Site clearance	Construction Operation	0.9 ha, short term and localized	• Demarcation of sensitive areas in consultation with relevant specialists and ECO; • Utilise local labour if possible; • Minimise removal of vegetation as far as possible; • Identification and relocation of protected species by a qualified ecologist (and application or the relevant biodiversity permits where required); • Minimize dust generation; • Limit vehicle access; • Implement alien vegetation management; • Ongoing identification of risks and impacts; • Emergency preparedness; • Monitoring and review; and • Avoid disturbance of fauna as much as possible, especially bird nesting sites.	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA DWAF Best Practice Guidelines	Throughout Construction and operation
Site access	Construction Operation	1054, 875244 ha, short term and localized	All employees and visitors to the site must undergo a site induction which shall include basic environmental awareness and site specific environmental requirements (e.g. site sensitivities and relevant protocols/procedures). This induction should be presented or otherwise facilitated by the Contractors EO/Mine EO wherever possible.	NEMA OHS and MHSA	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• Landowners/lawful occupiers must be notified prior to accessing properties. A date and time that is suitable to landowners/lawful occupiers and is reasonable to the applicant should be negotiated and agreed upon. • The number, identity of workers, work location and work to be done must be provided to the landowner/lawful occupier prior to going on site. • Consideration must be taken by the applicant and/or contractors when on site not to interfere with the existing land uses and practices.		
Establishment of site infrastructure	Construction	2,1 ha, short term and localized	• Minimise physical footprint of construction; • Ensure construction is consistent with occupational health and safety requirements; • Minimise vegetation clearance; • Ensure proper and adequate drainage; • Minimise waste and control waste disposal; • Fencing of all drill sites with security access control and warning signs; • Establish waste storage areas for recycling; • Ensure adequate containment of waste to prevent pollution; • Minimise dust generation; • Limit vehicle access to approved access roads; • Prepare contingency plans for spillage and fire risks.	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA DWAF Best Practice Guidelines NHRA	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			Temporary heritage signage around the conserved farmsteads during the construction (drilling) phase.		
Storage of construction vehicles	Construction and Operation	0,9 ha, short term and localized	• Any equipment that may leak, and does not have to be transported regularly, must be placed on watertight drip trays to catch any potential spillages of pollutants. The drip trays must be of a size that the equipment can be placed inside it; • Drip trays must be cleaned regularly and shall not be allowed to overflow. All spilled hazardous substances must be collected and adequately disposed of at a suitably licensed facility; and • Compacting of soil must be avoided as far as possible, and the use of heavy machinery must be restricted in areas outside of the proposed exploration sites to reduce the compaction of soils.	NWA DWAF BPG	Throughout Construction and operation
Transportation/ access to and from drill sites	Construction and Operation	2,1 ha, short term and localized	• Where possible, drill sites should be located along existing access roads to reduce the requirement for additional access roads; • Any new temporary access routes to a drill site should result in minimal disturbance to existing vegetation; • Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected landowner. This formal agreement should additionally stipulate landowners special conditions which would form a legally binding agreement;	NEMA NEMBA CARA NEMAQA Dust Regulations Road Traffic Act	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• All farm gates must be closed immediately upon entry/exit; • Under no circumstances may the contractor damage any farm gates, fences, etc.; • On-site vehicles must be limited to approved access routes and areas on the site so as to minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic (where relevant); • All construction and vehicles using public roads must be in a roadworthy condition and their loads secured. They must adhere to the speed limits and all local, provincial and national regulations with regards to road safety and transport; • Damage caused to public roads as a result of the construction activities must be repaired in consultation with the relevant municipal authorities; and • All measures should be implemented to minimize the potential of dust generation.		
Storage of hazardous substances	Construction and Operation	0,9 ha, short term and localized	All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner so as to prevent pollution of the environment or harm to people or animals. Appropriate measures must be implemented to prevent spillage and appropriate steps must be taken to prevent pollution in the event of a spill; and way that does not pose any danger of pollution even during times of high rainfall.	NWA NEMWA DWAF BPG NEMA	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• Hazardous substances must be confined to specific and secured areas, and stored at all-time within bunded areas; • Adequate spill prevention and clean-up procedures should be developed and implemented during the prospecting activities. • Should any major spills of hazardous materials take place, such should be reported in terms of the Section 30 of the NEMA.		
Waste management	Construction and Operation	Short-medium term, localized	• Waste generated on site must be recycled as far as possible. Recyclable waste must not be stored on site for excessive periods to reduce risk of environmental contamination; • Drill muds, formation water (if encountered), etc. would constitute waste and must be classified and ranked in terms of relevant legislation for correct disposal; and • A Waste Management System must be implemented, and provide for adequate waste storage (in the form of enclosed containers) waste separation for recycling, and frequent removal of non-recyclable waste for permanent disposal at an appropriately licensed waste disposal facility. No waste material is to be disposed of on site.	DWAF Minimum requirements for waste disposal NEMWA	Throughout Construction and operation

Prospecting boreholes:	Construction and Operation Decommissioning	0,9 ha, short term	• Vegetation clearing for prospecting sites should be kept to a minimum in order to reduce the disturbance footprint; • Compaction of soil must be avoided as far as possible, and the use of heavy machinery must	SANS 10103 ECA Noise Regulations NEMAQA	Throughout Construction and operation and decommissioning

Activities	**Phase**	**Size and Scale of Disturbance**	**Mitigation Measures**	**Compliance with Standards**	**Time Period for Implementation**

15 sites , with a footprint of 200 m^2 each			be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils; • All measures should be implemented to minimize the potential of dust generation; • Local residents should be notified of any potentially noisy activities or work and these activities should be undertaken at reasonable times of the day. These works should not take place at night or on weekends; • Noise attenuation on engines must be adequate, and the noisy activities must be restricted as far as is possible to times and locations whereby the potential for noise nuisance is reduced; • When working near to a potential sensitive area, the contractor must limit the number of simultaneous activities to the minimum; • Ensure proper storage of fuels; • On-site vehicles must be limited to approved access routes and areas on the site so as to minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic; • Workforce should be kept within defined boundaries and to agreed access routes. • No invasive prospecting activities to be undertaken within 500m of a watercourse. • Should any watercourse be affected, then the necessary water use licences should be	Dust Regulations NWA	

Activities	**Phase**	**Size and Scale of Disturbance**	**Mitigation Measures**	**Compliance with Standards**	**Time Period for Implementation**

			obtained from the Department of Water and Sanitation. • No ablution of site laydown areas is to be located within 100m of a watercourse. • Where shallow aquifers are encountered, a survey of the drinking water/ livestock watering boreholes should be undertaken (within 100m of the prospecting borehole sites). A detailed groundwater monitoring programme should be developed for these drinking water/ livestock watering boreholes and pre- and post-prospecting water quality samples should be taken. • Where drinking water/ livestock watering boreholes are to be affected, and where a pollution event occurs at a particular borehole, then the advice of a geo-hydrologist should be sought with regards to the need for plugging and casing of the prospecting boreholes.		
Prospecting	Construction and Operation	0,9 ha, short term	Workers must be easily identifiable by clothing and ID badges. Workers should carry with them, at all times a letter from the applicant stating their employment, title, role and manager contact details.	OHS and MHSA	Throughout Construction and operation
Resource definition drilling	Planning Phase Construction and Operation	0,9 ha, short term	Local residents (landowners and directly adjacent landowners) should be notified of any potentially noisy activities or work and these activities should be undertaken at reasonable	MPRDA Regulations GN R527 SANS 10103	Planning Phase Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			times of the day. This work should not take place at night or on weekends; • The contractor must attempt to restrict noisy activities as far as is possible to times and locations whereby the potential for noise nuisance is reduced; • Dust suppression methods must be applied when necessary to restrict the visual impact of dust emissions. • Any spills of hydrocarbons or fluids used during operation, must be cleaned up immediately; • An above ground drilling sump must be used to contain drilling mud in order to reduce surface and groundwater contamination. No earthen mud sumps are to be constructed and utilized; • No prospecting boreholes should be drilled in the immediate vicinity of existing private boreholes; • Soils in drilling areas where disturbances will be encountered must be stripped and stockpiled outside affected areas for use after completion of the drilling program. • Topsoil must be adequately stripped to the correct depth and stored separately from subsoils; • Cut of trench and berm must be constructed around the drill pad to prevent contaminated surface runoff from entering shallow aquifers and surrounding water resources, where required by the topography; • A liner should be placed over the drill pad and drip trays must be used in all areas where hydrocarbons are handled; • On-site vehicles must be limited to approved access routes and areas on the site so as to	ECA Noise Regulations NEMAQA Dust Regulations NWA DWAF BPG NHRA	

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic; • Workforce should be kept within defined boundaries ad to agreed access routes; • The designated competent authority (DMRE) may, at the cost of the Applicant, appoint an independent and competent person to undertake borehole examination. • Should any fugitive emissions be detected, then the recommendations of the must be undertaken throughout the drilling activity up to the decommissioning of the wells. • Should any chance finds be uncovered during the construction phase, these must be handled in accordance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA); and • If a possible heritage site (including graves) or artefact is discovered during construction, all operations in the vicinity of the discovery (at least 30 m buffer) should stop and a qualified specialist contracted to evaluate and recommend appropriate actions. Depending on the type of site that can include initiating a grave relocation process, documentation of structures or archaeological excavations. • Should fossil remains be discovered in the Cenozoic Superficial deposits during any phase of construction, either on the surface or exposed by fresh excavations, the ECO responsible for these developments should be alerted immediately. Such discoveries ought to be protected (preferably in situ) and the ECO should alert SAHRA so that appropriate mitigation		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			recording, sampling or collection) can be taken by a professional palaeontologist. • The Final BAR and appendices must be submitted to SAHRA for record purposes; • If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; and • If the development receives an Environmental Authorisation (EA), SAHRA must be informed and all documents pertaining to the EA must be uploaded to the SAHRIS Case file. • Temporary heritage signage around the conserved.		
Refuelling	Construction and Operation	Short term and localized	Refuelling may only take place within demarcated areas that is subject to appropriate spill prevention and containment measures refuelling	NWA DWAF BPG	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			and transfer of hazardous chemicals and other potentially hazardous substances must be carried out so as to minimize the potential for leakage and to prevent spillage onto the soil; Drip trays should be utilized in relevant locations (inlets, outlets, points of leakage, etc.) during transfer so as to prevent such spillage or leakage. Any accidental spillages must be contained and cleaned up promptly.		
Maintenance and repair	Construction and Operation	Short term and localized	• Trucks, machinery and equipment must be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks must be cleaned up immediately using spill kits or as per the emergency response plan. For large spills a hazardous materials specialist shall be utilized; • Accidental hydrocarbon spillages must be reported immediately, and the affected soil should be removed, and rehabilitated or if this is not possible, disposed of at a suitably licenced waste disposal facility.	NWA DWAF BPG NEMA	Throughout Construction and operation
Borehole Closure	Decommissioning and Closure	Short term and localized	• Where groundwater is encountered during drilling, all affected prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers; • Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained	NWA DWAF BPG	Throughout Decommissioning and Closure

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			therein. As a result, the contractor shall ensure that: o Concrete shall not be mixed directly on the ground; o The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste, (Washing of visible signs into the ground is not acceptable); and o All excess aggregate shall also be removed.		
Removal of surface infrastructure	Decommissioning	Short term and localized	• All infrastructure, equipment, and other items used during prospecting will be removed from the site. • Compaction of soil must be avoided as far as possible. The use of heavy machinery must be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils.	MPRDA Rehab Plan	Decommissioning
Removal of waste	Decommissioning	Small scale and localized	Any excess or waste material or chemicals, including drilling muds etc. must be removed from the site and must preferably be recycled (e.g. oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled must be disposed of at a suitably licensed waste facility.	NWA DWAF BPG	Decommissioning
Rehabilitation	Rehabilitation	All disturbed areas	Restoration and rehabilitation of disturbed areas must be implemented as soon as prospecting activities are completed;	MPRDA Rehab Plan NEMA	Rehabilitation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• Sites must be restored to the original condition with vegetation cover (where applicable) equalling the surrounding vegetation cover; • All debris and contaminated soils must be removed and suitably disposed of; • Contours and natural surrounding must be reformed; • Natural drainage patterns must be restored; • All surface infrastructure on site must be removed; • Temporary access routes/roads must be suitably rehabilitated; and • Sites must be monitored by the ECO (including relevant specialist's inputs if, necessary) for adequate rehabilitation until the desired rehabilitation objectives have been achieved.		
Consultation	Planning Phase Construction and Operation	Medium term, local	Stakeholder engagement will continue throughout the prospecting activities to ensure the community and landowners are kept informed and allowed to raise issues. The Applicant shall attend applicable community meetings with the affected communities. Any issues raised will then be addressed through a grievance mechanism.	NEMA OHS and MHSA	Planning Phase Throughout Construction and Operation
Monitoring	Post-Operational	All rehabilitated areas	The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1)	MPRDA Rehab Plan	Post-operation

			year unless otherwise specified by the competent authority. The monitoring activities during this period will include but not be limited to: • Biodiversity monitoring; and • Re-vegetation of disturbed areas where required. Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.		

21.4. IMPACT MANAGEMENT ACTIONS AND OUTCOMES

Table 16: Summary of Impact Management Actions and Outcomes

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
	• Sedimentation • Erosion			vehicle maintenance)	NEMAQA Dust regulations NWA DWAF best Practice Guidelines

Establishment of base camps and access	• Interference with existing land uses • Safety and security risks to landowners and lawful occupiers; • Deterioration and damage to existing access roads and tracks; • Dust generation; • Clearance of vegetation; • Pollution of soils • Contamination on surface and ground	Topography; Landform; Soil disturbance; Fauna and Flora; Air Quality; Surface Water; Groundwater; Socioeconomics	Construction Operation	Avoidance and control through preventative measures (e.g. communication with landowners, site access control) Remedy through application of mitigation measures in EMP	NEMA MPRDA NEMBA CARA Threatened or Protected Species (TOPS) regulations NEMAQA Dust regulations NWA DWAF best Practice
Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved Guidelines**

Storage of construction vehicles	• Pollution of surface and groundwater resources from potential hydrocarbon spills; and • Compaction of soils	Surface water; Groundwater; Soils.	Construction Operation	Avoid through implementation of EMP mitigation measures (e.g. communication with landowners) Control through implementation of ESMS	Protected Species (TOPS) regulations NEMAQA Dust regulations NWA DWAF best Practice Guidelines
Transportation to and from drill sites	Soil compaction; Disturbance and Loss of fauna and flora; Wearing and tearing of existing roads; and Dust generation from increased traffic.	Soil disturbance; Fauna and Flora; Air quality.	Construction Operation	Avoid and control through implementation of EMPr mitigation measures (e.g. speed limit enforcement, vehicle maintenance)	NEMA NEMBA CARA Threatened or Protected Species (TOPS) regulations NEMAQA
Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved**

					Dust regulations NWA DWAF best Practice Guidelines
Storage of hazardous substances	Potential hydrocarbon spills that could pollute surface and ground water resources.	Surface water; Groundwater.	Construction Operation	Avoid and control through implementation of EMP mitigation measures (e.g. speed limit enforcement, vehicle maintenance)	NEMA NEMBA NWA DWAF best Practice Guidelines
Waste management	Pollution of habitats and surrounding areas.	Pollution	Construction Operation	Avoid and control through implementation of EMP mitigation measures (e.g. speed limit enforcement,	DWAF minimum requirement for waste disposal
Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved**

				vehicle maintenance)	
Prospecting boreholes	Vegetation clearance; Possible erosion; Changes in drainage and surface hydrology; Soil disturbance and compaction; Emissions from vehicles; Land use conflict; Noise disturbance due to acoustic sources; Dust generation; Disturbance or damage of palaeontological resources; Potential spills of hydrocarbons; Influx of people; Impact on groundwater	Ecology; Topography; Access/footprint; Soil disturbance; Noise; Air Quality; Socio-economics; Groundwater	Construction Operation Decommissioning	Control through implementation of EMPR mitigation measures	SANS10103 ECA Noise Regulations NEMAQA Dust regulations NWA
Resource definition drilling	Vegetation clearance Removal of topsoil; Changes in drainage and surface hydrology; Drainage and soil contamination; Land use conflict; Dust generation;	Air Quality; Noise; Surface water; Groundwater,	Operation	Control through implementation of EMPR mitigation measures	SANS10103 ECA Noise Regulations NEMAQA Dust regulations

Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved**

	Disturbance of wildlife and communities in close vicinity; New access roads; Increased transportation; Damage to local infrastructure; Disturbance or damage of palaeontological resources; Influx of people; Waste water discharge; Spillage and leaks of hydrocarbons; Pollution or interplay between groundwater aquifers; Waste disposal.				NWA DWAF best Practice Guidelines	
Refuelling	Potential hydrocarbon spills that could pollute soil or surface and/or groundwater resources.	Pollution; Surface water; Groundwater	Construction Operation	Control through implementation of EMPR mitigation measures	NWA DWAF Practice Guidelines	best
Maintenance and repair	Potential hydrocarbon spills that could pollute surface and groundwater resources.	Pollution; Surface water; Groundwater	Construction Operation	Control through implementation of EMPR mitigation measures	NWA	

Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved**

Borehole closure	• Pollution of groundwater resources; • Potential pollution of habitats with cement residue that may be exposed to runoff etc.	Pollution; Groundwater	Decommissioning	Control through implementation of EMPR mitigation measures	NWA
Removal of surface infrastructure	• Soil compaction; • Pollution of soil and surrounding vegetation.	Landform; Topography; Soils.	Decommissioning	Control through implementation of EMPR mitigation measures	MPRDA In accordance with Rehabilitation plan
Rehabilitation	• Soil compaction; • Soil and Water contamination; • Erosion; • Change is drainage and surface hydrology; • Loss of habitat; and • Disturbance to wildlife and communities in close vicinity	Topography Land use Soil disturbance Ecology Surface water Groundwater	Rehabilitation	Control through implementation of EMPR mitigation measures	MPRDA In accordance with Rehabilitation plan
Monitoring of rehabilitated sites	• Soil compaction; • Soil and Water contamination; • Erosion; • Disturbance to wildlife; and communities in close vicinity.	Topography Land use Soil disturbance Ecology Surface water Ground water	Post-operation	Control through adhering to monitoring requirements	MPRDA and regulations

22. FINANCIAL PROVISION

On 20th November 2015 the Minister promulgated the Financial Provisioning Regulations under the NEMA. The regulations aim to regulate the determine and making of financial provision as contemplated in the NEMA for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, prospecting, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, inter alia:

- Determination of financial provision: An applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, prospecting, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts.
- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:

  o Annual rehabilitation – annual rehabilitation plan o Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan; and o Remediation of latent defects.

- Regulation 10: An applicant must- o ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the Mineral and Petroleum Resources Development Act, 2002; and to Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, prospecting, mining or production operations.
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA regulations.

22.1. OTHER GUIDELINES

The following additional guidelines which relate to financial provisioning and closure have been published in the South African context:

- Best Practice Guideline G5: Water Management Aspects for Mine Closure: This guideline was prepared by the DWS and aims to provide a logical and clear process that can be applied by mines and the competent authorities to enable proper mine closure planning that meets the requirements of the relevant authorities. This guideline is aimed primarily at larger scale mines and does not specifically address closure issues related to closure of prospecting activities, however certain principles related to closure and water management are relevant. The following technical factors which should be considered during closure, and which are likely to relate to prospecting activities, have been considered:
  - Land use plan: directly interlinked with water management issues insofar as water is required to support the intended land use- in this regard the surrounding communities and the land uses implemented rely on available ground and surface water to be sustained. Management of water quality and quantity has been identified as an aspect to be covered in the FRDCP (Appendix).
  - Public participation and consultation: consultation is fundamental to closure and there is a need for full involvement of stakeholders in the development of the final closure plans, and in the agreement of closure objectives- in this regard this FRDCP has been made available through the Basic Assessment public participation process for comment by relevant stakeholders.
  - Guideline for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine: The objectives of the guideline include the need to improve the understanding of the financial and legal aspects pertaining to the costing of remediation measures as a result of mining activities. Whilst this guideline predates the recent NEMA Financial Provisioning Regulations, it does contain certain principles and concepts that remain valid and have been considered in the FRDCP (Appendix E).

22.2. DESCRIBE THE CLOSURE OBJECTIVES AND THE EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE BASELINE ENVIRONMENT DESCRIBED UNDER THE REGULATION

Considering the relatively limited impact of the proposed prospecting activities, the closure objectives are aimed at re-instating the landform, land use and vegetation units to the same as before prospecting operations take place unless a specific, reasonable alternate land use is requested by the landowner. As such, the intended end use for the disturbed prospecting areas and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate. The overall aim of the rehabilitation plan is to rehabilitate the environment

to a condition as close as possible to that which existed prior to prospecting. This shall be achieved with a number of specific objectives.

1. **Making the area safe.** i.e. Decommission prospecting activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, sealing boreholes, etc.
2. **Recreating a free draining landform.** This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.
3. **Re-vegetation.** This involves either reseeding or allowing natural succession depending on the area, climate etc.
4. **Storm water management and erosion control.** Management of storm water and prevention of erosion during rehabilitation. E.g. cut off drains, berms etc. and erosion control where required.
5. **Verification of rehabilitation success.** Entails monitoring of rehabilitation.
6. **Successful closure.** Obtain closure certificate.

22.3. CONFIRM SPECIFICALLY THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNER AND INTERESTED AND AFFECTED PARTIES

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant Interested and Affected Parties (I&AP's) are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the as part of the prospecting right application needs to be managed sensitively and according to best practises in order to ensure and promote:

- Compliance with national legislation;
- Establish and manage relationships with key stakeholder groups; and
- Encourage involvement and participation in the environmental study and authorisation/ approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Introduce the proposed project;
- Explain the environmental authorisations required;
- Explain the environmental studies already completed and yet to be undertaken (where applicable);
- Determine and record issues, concerns, suggestions, and objections to the project;
- Provide opportunity for input and gathering of local knowledge;
- Establish and formalise lines of communication between the I&AP's and the project team;
- Identify all significant issues for the project; and

- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximize and/or promote positive environmental impacts associated with the project.

Landowners and interested and affected parties have been consulted and provided an opportunity to comment on this Basic Assessment Report, EMPR including all decommissioning, closure and rehabilitation plans.

22.4. REHABILITATION PLAN

22.4.1. INTEGRATED REHABILITATION AND CLOSURE PLAN

The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the project's closure plan is defined and understood from before starting the process and is complementary to the rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project at hand and be aligned with the EMPr. The overall rehabilitation objectives for this project are as follows:

- Maintain and minimise impacts to the ecosystem within the study area;
- Re-establishment of the pre-developed land capability to allow for a suitable post-mining land use;
- Prevent soil, surface water and groundwater contamination;
- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.

Successful rehabilitation must be sustainable, and requires an understanding of the basic baseline environment, as well as project management to ensure that the rehabilitation program is a success.

It is noted that an application for environmental authorisation must be submitted for closure in accordance with Listing Notice 1 Activity 22:

The decommissioning of any activity requiring –

I. a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or
II. A prospecting right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.

22.4.2. PHASE 1: MAKING SAFE

In line with the DWAF (2008). Best Practice Guideline A6: Water Management for Underground Mines. All prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers. Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. As a result, the contractor shall ensure that:

- Concrete shall not be mixed directly on the ground;
- The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste, (Washing of visible signs into the ground is not acceptable); and
- All excess aggregate shall also be removed.

22.4.3. PHASE 2: LANDFORM DESIGN, EROSION CONTROL AND REVEGETATION

Landform, erosion control and re-vegetation is an important part of the rehabilitation process. Landform and land use are closely interrelated, and the landform should be returned as closely as possible to the original landform. Community expectations, compatibility with local land use practices and regional infrastructure, or the need to replace natural ecosystems and faunal habitats all support returning the land as closely as possible to its original appearance and productive capacity. This requires the following:

- Shape, level and de-compact the final landscape after removing all the project infrastructure, dress with topsoil and, where necessary, vegetate with indigenous species. Commission specialists to assist in planning re-vegetation and the management of environmental impact, as required.
- Remove access roads with no beneficial re-use potential by deep ripping, shaping and levelling after the removal and disposal of any culverts, drains, ditches and/or other infrastructure. Natural drainage patterns are to be reinstated as closely as possible.
- Shape all channels and drains to smooth slopes and integrate into the natural drainage pattern.
- Construct contour banks and energy dissipating structures as necessary to protect disturbed areas from erosion prior to stabilisation.
- Promote re-vegetation through the encouragement of the natural process of secondary succession.
- Natural re-vegetation is dependent on de-compaction of subsoils and adequate replacement of the accumulated reserves of topsoil (for example, over the borehole sites), so as to encourage the establishment of pioneer vegetation.
- Remove alien and/or exotic vegetation.
- Undertake a seeding programme only where necessary, and as agreed with the re-vegetation specialist.

22.4.4. PHASE 3: MONITORING AND MAINTENANCE

The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority.

The monitoring activities during this period will include but not be limited to:

- Biodiversity monitoring; and
- Re-vegetation of disturbed areas where required.

Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.

22.4.5. POST-CLOSURE MONITORING AND MAINTENANCE

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the relevant authority for approval, as a part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of the prospecting borehole sites and related activities.

It is recommended that the post-closure monitoring include the following:

- Confirmation that any waste, wastewater or other pollutants that is generated as a result of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan,
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning.
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants.
- Confirmation that the prospecting borehole sites are safe and are not resulting in a pollution hazard.

Annual environmental reports will be submitted to the Designated Authority and other relevant Departments for at least one-year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority.

The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed and free condition.

22.5. EXPLAIN WHY IT CAN BE CONFIRMED THAT THE REHABILITATION PLAN IS COMPATIBLE WITH THE CLOSURE OBJECTIVES

The rehabilitation plan is compatible with the closure objectives in that is seeks to ensure that negative impacts on the receiving environment that could not be prevented or mitigated during prospecting are rehabilitated. The use of indigenous species during re-vegetation will ensure that ecosystem restoration is initiated and prevent invasion by alien species, the capping of boreholes will prevent future environmental issues related to fluid leakage or lateral movement through the borehole, as well as protect water resources. The appropriate disposal of waste will ensure that land is usable, in alignment with surrounding land uses and that no hazardous materials are left on site post-prospecting.

22.6. CALCULATE AND STATE THE QUANTUM OF THE FINANCIAL PROVISION REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT IN ACCORDANCE WITH THE APPLICABLE GUIDELINE

For a detailed description of the financial provision, please refer to appendix 7 for the Final Rehabilitation, Decommissioning and Closure Plan.

22.7. CONFIRM THAT THE FINANCIAL PROVISION WILL BE PROVIDED AS DETERMINED

DC Ore Minerals and Energy herewith confirms both its capacity and willingness to make the financial provision required should the prospecting right be granted. Work will be approved on a phase by phase basis, dependent on the results obtained in the previous phase i.e. although prospecting work may be provided for financially in the budget for a specific year, it will only take place if justified. The amount is also reflected in the Prospecting Work Programme submitted to the DMRE.

23. MECHANISMS FOR MONITORING COMPLIANCE

Table 17: Mechanisms for monitoring compliance

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Desktop Study: Literature Survey / Review / acquisition of data	None	None	None	None
Geological field mapping	All Impacts Identified in the EMPr	• Site inspections and checklists; • Complaints register	Contractors Environmental Representative; ECO	Daily inspections and checklists
Regional Ground Geophysical Surveys	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists
Site Clearance: **The clearance of an area of 600 square metres or more of indigenous vegetation in Northern Cape Within critical biodiversity areas identified in bioregional plans.**	• Possession of permits for protected species • Relocation of protected species • Alien vegetation management • Implement the recommendations	• Document Control • Site Inspections and checklists • Report review and • Development of actions plans	• Contractors Environmental Representative; • Environmental specialist, ECO • Senior Environmental Management	• Once-off control of documents, site visit and reporting; • Monthly site visits; • Monthly Reports Annual Performance Assessment

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
	heritage specialist report and the Heritage Management Plan			
Target Prospecting Boreholes: **15 drill sites, each site covering a total area of 0.9 ha**	• Alien vegetation management • Noise (if any complaints are registered by residents) • Air quality (if complaints are registered) • Surface and groundwater management • Impacts on heritage features • Impact on conserved farmsteads	• Site Inspections and checklists; • Report review and development of corrective action plans • Inspection of surface water features • Survey of groundwater users and use within 5km of the invasive prospecting sites. • Demarcation of sensitive areas	• Contractors Environmental Representative; • Environmental specialist, ECO • Senior Environmental Management; • Geohydrologist (if required)	• Once-off control of documents, site visit and reporting; • Monthly site visits; • Monthly Reports Annual Performance • Prior to invasive prospecting activities and monitoring post-prospecting.
Data Compilation	None	None	None	None

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Detailed Ground geophysical Surveys	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists
Widely Spaced Prospecting Boreholes: **15 sites , with a footprint of 0.9ha each**	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative; ECO	Daily inspections and checklists
Closely Spaced Prospecting Boreholes	• Alien vegetation management • Noise (if any complaints are registered by residents) • Air quality (if complaints are registered)	• Site Inspections and checklists; • Report review and development of corrective action plans	• Contractors Environmental Representative; • Environmental specialist, ECO • Senior Environmental Management.	• Once-off control of documents, site visit and reporting; • Monthly site visits; • Monthly Reports Annual Performance
Environmental Screening by ECO	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Ablutions - Chemical Toilets	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists
Sample storage (Existing BMM prospecting office. No new infrastructure to be constructed)	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists
Access Route (Mostly existing roads to be utilised. Access tracks will be made where there are no existing routes.) Approximate total length: 5000 m Approximate width: 3m)	All Impacts Identified in the EMP	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists
Temporary general waste storage (General/domestic waste - Wheelie bin)	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Temporary hazardous waste storage (Hazardous waste – Sealed Container)	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Daily inspections and checklists
Compilation of geological plans	None	None	None	None
Undertake decommissioning and rehabilitation as per the rehabilitation plan	• Alien vegetation management • Noise (if any complaints are registered by residents) • Air quality (if complaints are registered)	• Site Inspections and checklists; • Report review and development of corrective action plans	• Contractors Environmental Representative; • Environmental specialist, ECO • Senior Environmental Management • Surface water specialist	• Monthly site visits; • Monthly Reports and Annual Performance Assessments
Monitoring of rehabilitation efforts	All Impacts Identified in the EMPr	Site Inspections and checklists	• ECO; • Independent Environmental Auditor	Monthly reports

Surface Water	All Impacts Identified in the EMPr	Site Inspections and checklists; Report review and development of corrective action plans	ECO; • Contractors Environmental Representative; • Senior Environmental Management	Monthly Reports
Groundwater	All Impacts Identified in the EMPr	• Site Inspections and checklists; • Report review and development of corrective action plans	• Environmental specialist, ECO • Senior Environmental Management	• Monthly; • If pollution event occurs at boreholes.

24. INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT/ ENVIRONMENTAL AUDIT REPORT

The result of environmental monitoring and compliance to the approved EMPR will be undertaken every second year and submitted to the DMRE in the form of an environmental performance assessment. Included in the report will be the following relevant information:

- The period when the performance assessment was conducted;
- The scope of the assessment;
- The procedures used for conducting the assessment;
- Interpreted information gained from monitoring the EMPR;
- Evaluation criteria used during the assessment;
- Results of the assessment are to be discussed and mention must be made of any gaps in the EMPR and how it can be rectified; and
- Yearly updated layout plans.

Any emergency or unforeseen impacts will be reported immediately to the DMRE and other relevant government departments.

25. ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Training and environmental awareness is an integral part of a complete EMPR. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorisations, licences, permits and the approved EMPR and protection of the environment.

The applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner, and are capable of complying with the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risks;
- Understanding the nature of risks;
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The applicant shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition to the environment;
- The importance of compliance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- Compliance with mitigation measures proposed for sensitive areas;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences (legal and/or other) of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities; and
- All operational risks must be identified and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with in order to avoid pollution and/or degradation of the environment.

In the case of new staff (including contract labour) the contractor / applicant shall keep a record of adequate environmental induction training.

25.1. MANNER IN WHICH EMPLOYEES WILL BE INFORMED OF ENVIRONMENTAL RISKS

Environmental awareness could be fostered by induction course for all personnel on site, before commencing site visits. Personnel should also be alerted to particular environmental concerns associated with their tasks for the area in which they are working. Courses must be given by suitably qualified personnel and in a language and medium understood by personnel. The environmental awareness training programme will include the following:

1. Occupational Health and Safety Training (OHS); and
2. Environmental Awareness Training BAR & EMPR management actions.

Environmental awareness training will focus on the following specific aspects and be undertaken in "Tool box talk" topics prior to site access:

1. Waste collection and disposal; and
2. EMPR management options and application.

25.2. MANNER IN WHICH RISKS WILL BE DEALT WITH TO AVOID POLLUTION OR DEGRADATION

The broad measures to control or remedy any causes of pollution or environmental degradation as a result of the proposed prospecting activities taking place are provided below:

- Contain potential pollutants and contaminants (where possible) at source;
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates;
- Ensure the timeous clean-up of any spills;
- Implement a waste management system for all waste stream present on site;
- Investigate any I&AP's claims of pollution or contamination as a result of mining activities; and
- Implement the impact management objectives, outcomes and actions, as described in Section 26 above.

It is of critical importance that the broad measures to control or remedy any causes of pollution or environmental degradation are applied during onsite prospecting activities.

26. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional information was requested or is deemed necessary.

27. 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:

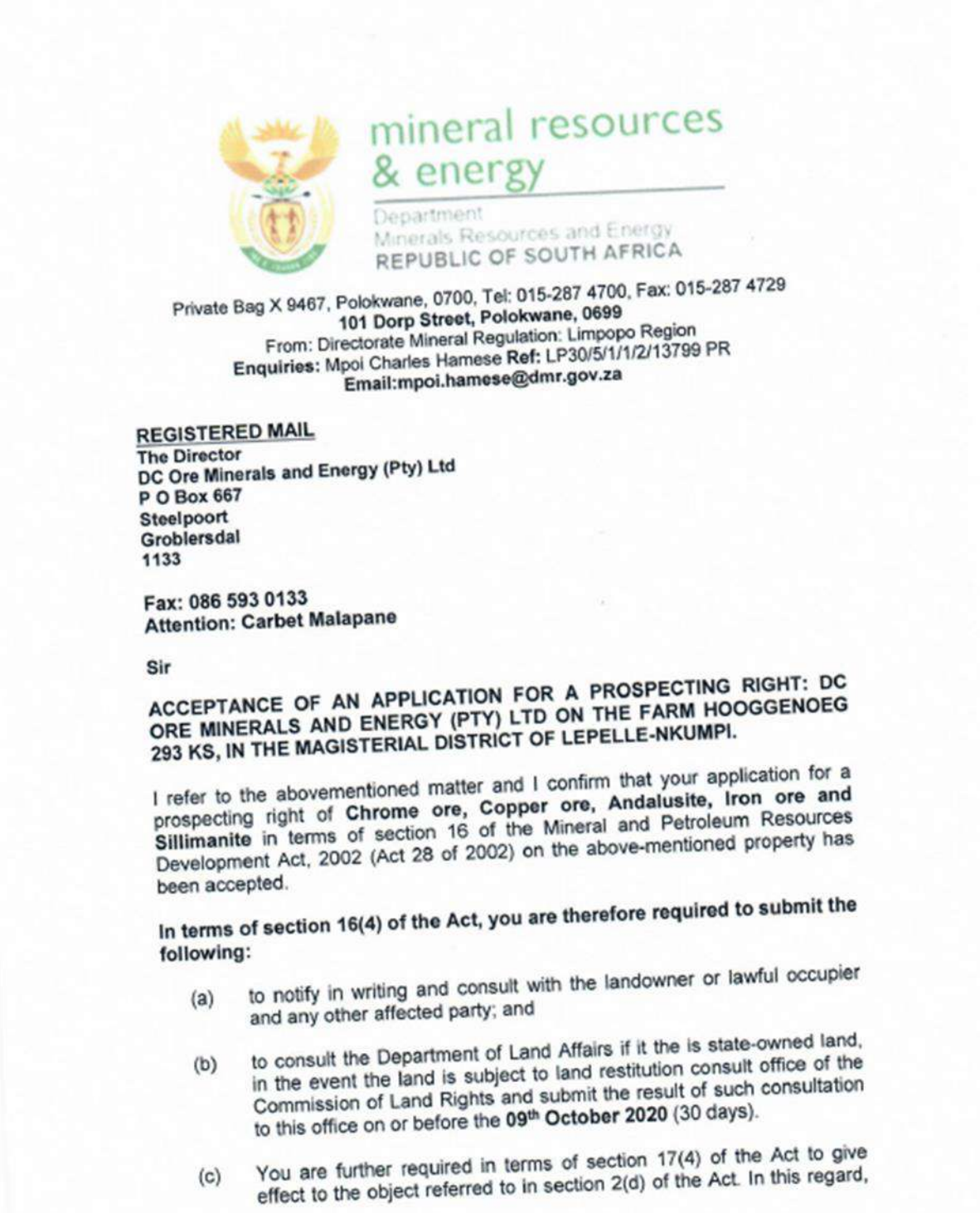
Name of company:

Date:

29. APPENDICES

Appendix 1: DMRE letters

1B: Acceptance letter



mineral resources & energy

Department
Minerals Resources and Energy
REPUBLIC OF SOUTH AFRICA

Private Bag X 9467, Polokwane, 0700, Tel: 015-287 4700, Fax: 015-287 4729
101 Dorp Street, Polokwane, 0699
From: Directorate Mineral Regulation: Limpopo Region
Enquiries: Mpoi Charles Hamese **Ref:** LP30/5/1/1/2/13799 PR
Email:mpoi.hamese@dmr.gov.za

REGISTERED MAIL
The Director
DC Ore Minerals and Energy (Pty) Ltd
P O Box 667
Steelpoort
Groblersdal
1133

Fax: 086 593 0133
Attention: Carbet Malapane

Sir

ACCEPTANCE OF AN APPLICATION FOR A PROSPECTING RIGHT: DC ORE MINERALS AND ENERGY (PTY) LTD ON THE FARM HOOGGENOEG 293 KS, IN THE MAGISTERIAL DISTRICT OF LEPELLE-NKUMPI.

I refer to the abovementioned matter and I confirm that your application for a prospecting right of **Chrome ore, Copper ore, Andalusite, Iron ore and Sillimanite** in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) on the above-mentioned property has been accepted.

In terms of section 16(4) of the Act, you are therefore required to submit the following:

(a) to notify in writing and consult with the landowner or lawful occupier and any other affected party; and

(b) to consult the Department of Land Affairs if it the is state-owned land, in the event the land is subject to land restitution consult office of the Commission of Land Rights and submit the result of such consultation to this office on or before the **09th October 2020** (30 days).

(c) You are further required in terms of section 17(4) of the Act to give effect to the object referred to in section 2(d) of the Act. In this regard,

you are required to submit by no later than **09th October 2020** the following documents:

a. duly signed shareholders agreement;
b. share certificates and shareholders's register;
c. article and memorandum of association of the company;
d. details relating to funding (all relevant agreements); and
e. any other agreement or documents relating to the agreement.

In light of the minimum requirements as stipulated on Regulation 16 (1) and 16 (2) of the EIA Regulations, your application for an Environmental Authorization was incomplete as it was not accompanied by this acceptance letter as per sub Regulation 16 (1) (ix) and considering that it is now completed by this acceptance letter, you are hereby required to submit the documents as stipulated on Regulation 19 (1) to 19 98) of the EIA Regulations (only in cases where Basic Assessment Report is applicable) or Regulations 21 (Scoping Report) and Regulation 23 (EIR and EMPr) (in case of Scoping and Environmental Impact Report). All timeframes are effective from the date of this letter.

Acceptance of your application does not grant you the right to commence with prospecting operations. Your application will be evaluated / processed and a recommendation on the granting / refusal of the right will be forwarded to the Minister or her delegate. Any person operating without a prospecting / mining right or mining permit will be in contravention of Section 5(4) of the MPRDA and would be guilty of an offence in terms of the relevant Act.

Should it transpire at later stage that the area under application is encumbered by an old order right, the Department will be entitled to refuse this application based on the fact that an old order right for the same minerals, has already been granted to another entity, as the granting thereof would be contrary to the provisions of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

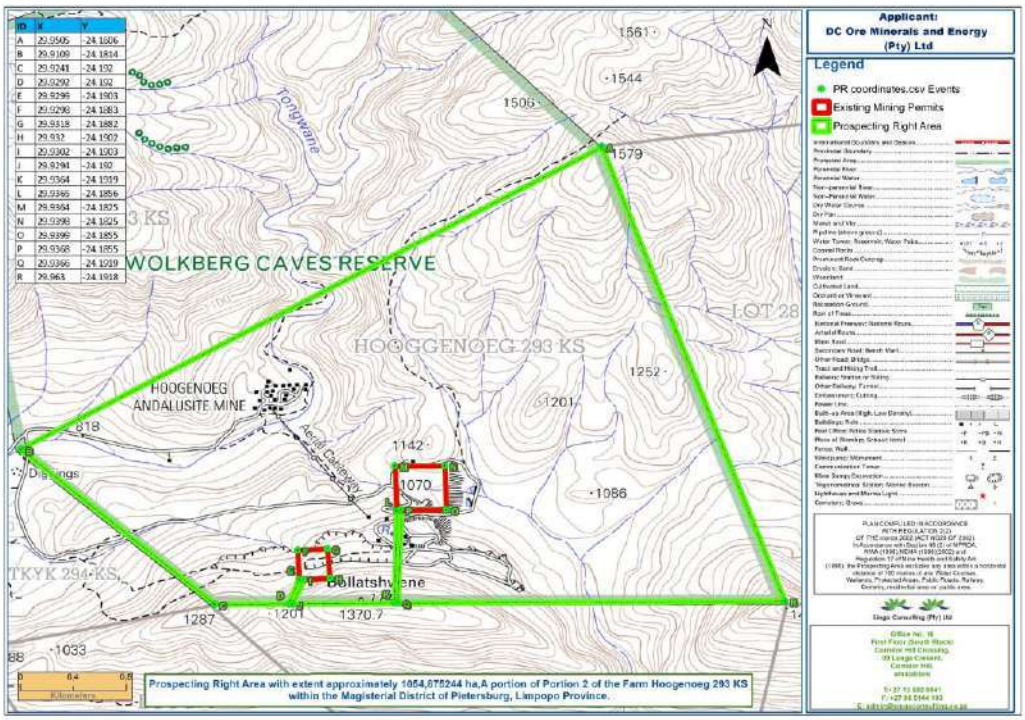
Yours faithfully

.....

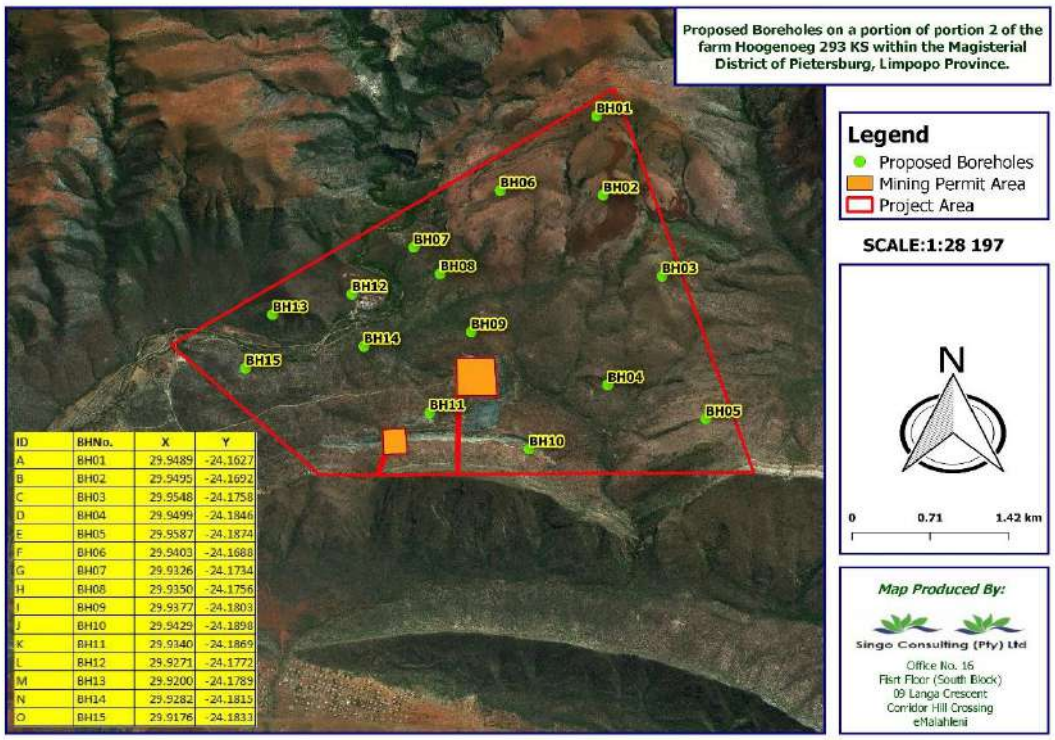
REGIONAL MANAGER
LIMPOPO REGION: POLOKWANE
DATE: 29/05/2020

Appendix 2: EAP's Curriculum Vitae

Appendix 3: Project maps

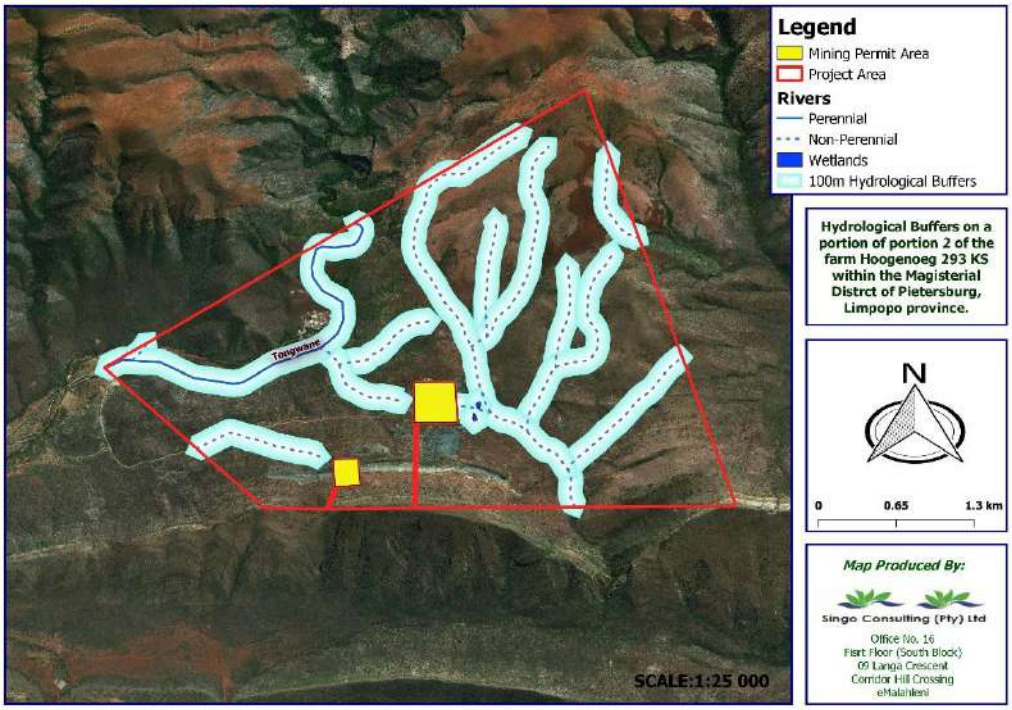


Regulation 2.2 map

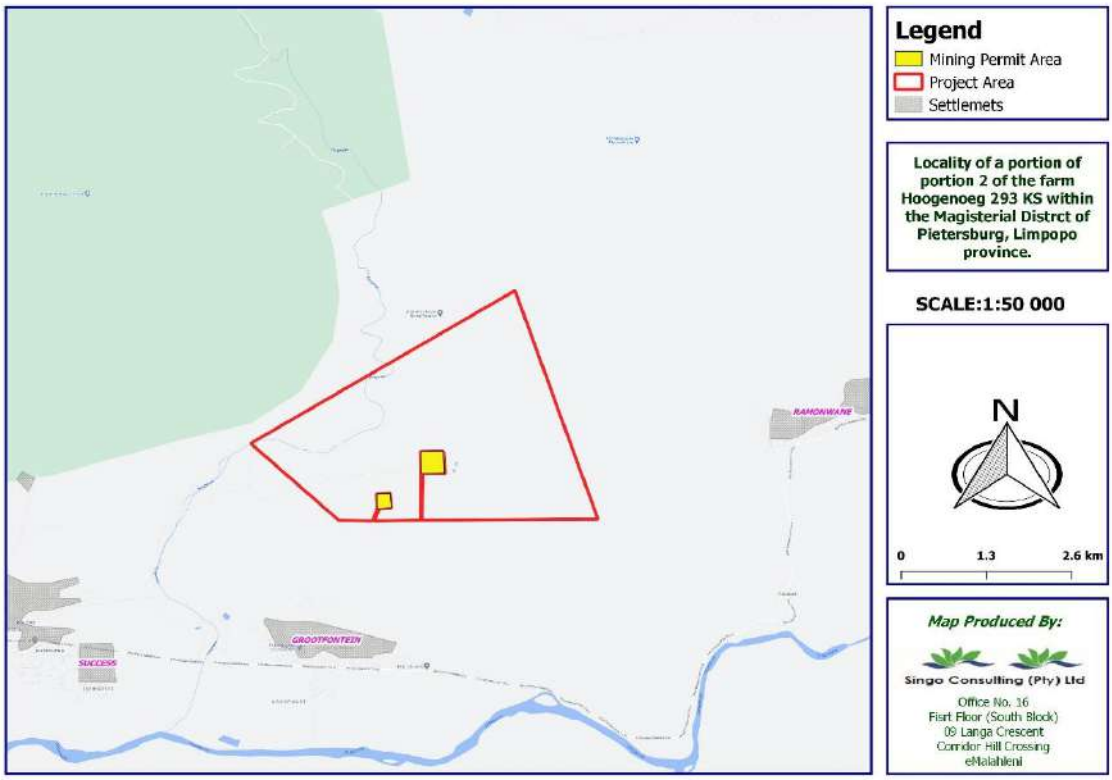


ID	BHNo.	X	Y
A	BH01	29.9489	-24.1627
B	BH02	29.9495	-24.1692
C	BH03	29.9548	-24.1758
D	BH04	29.9499	-24.1846
E	BH05	29.9587	-24.1874
F	BH06	29.9403	-24.1688
G	BH07	29.9326	-24.1734
H	BH08	29.9350	-24.1756
I	BH09	29.9377	-24.1803
J	BH10	29.9429	-24.1898
K	BH11	29.9340	-24.1869
L	BH12	29.9271	-24.1772
M	BH13	29.9200	-24.1789
N	BH14	29.9282	-24.1815
O	BH15	29.9176	-24.1833

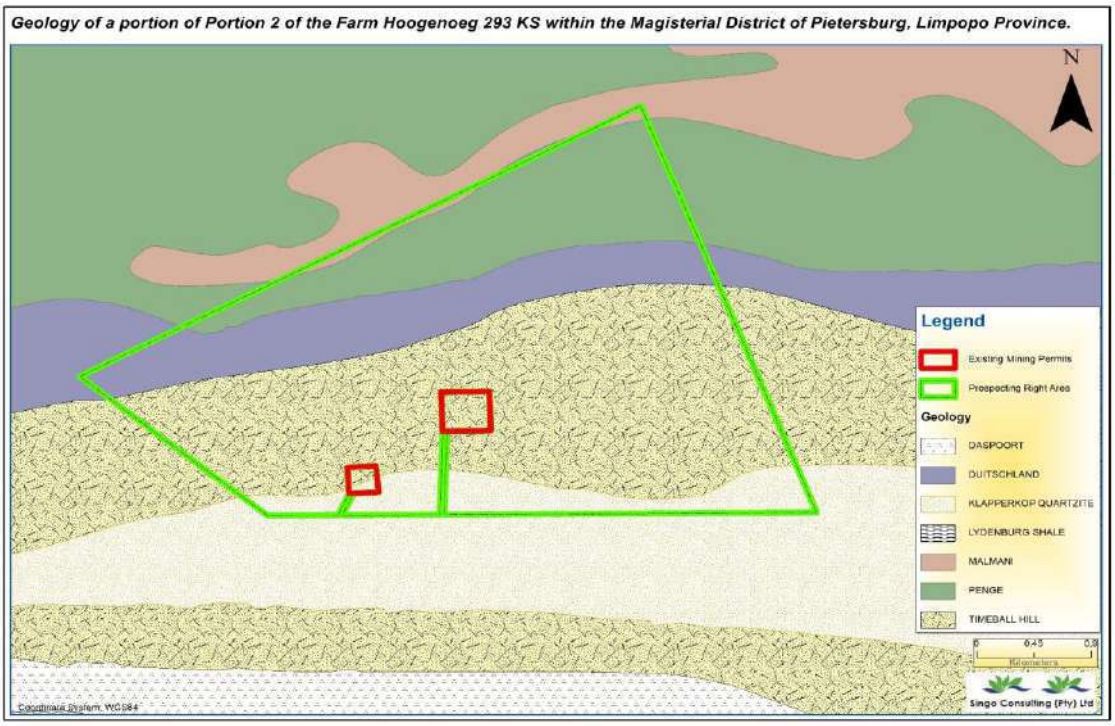
Proposed borehole map



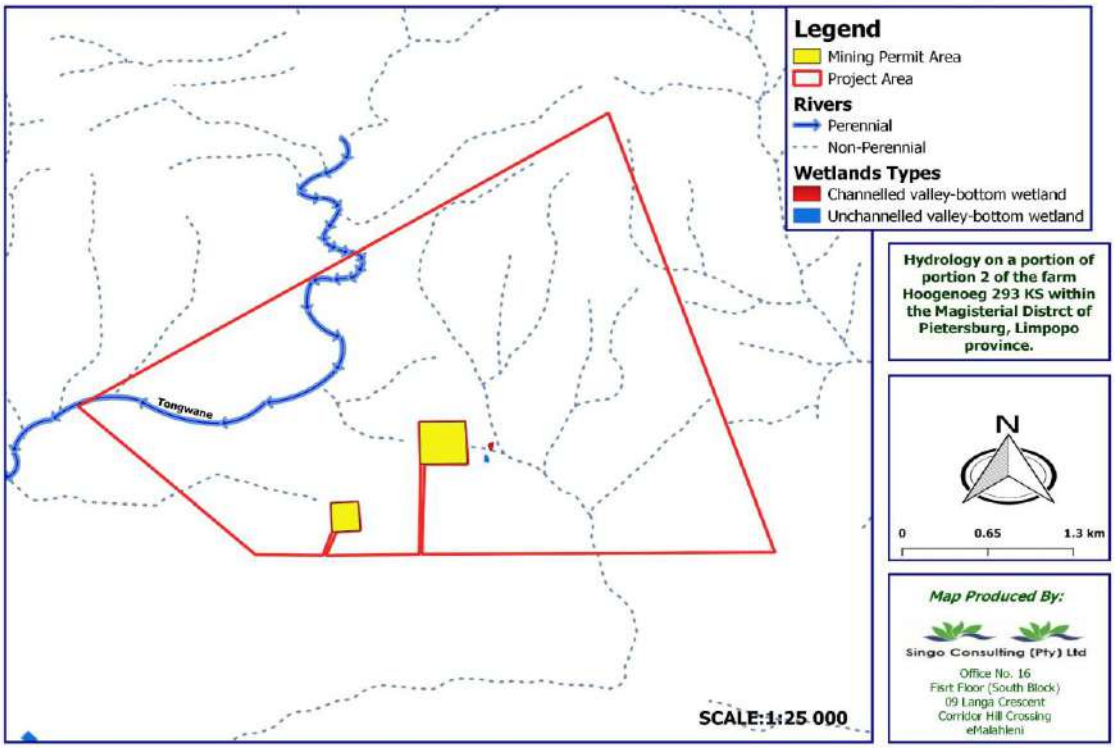
Buffer map



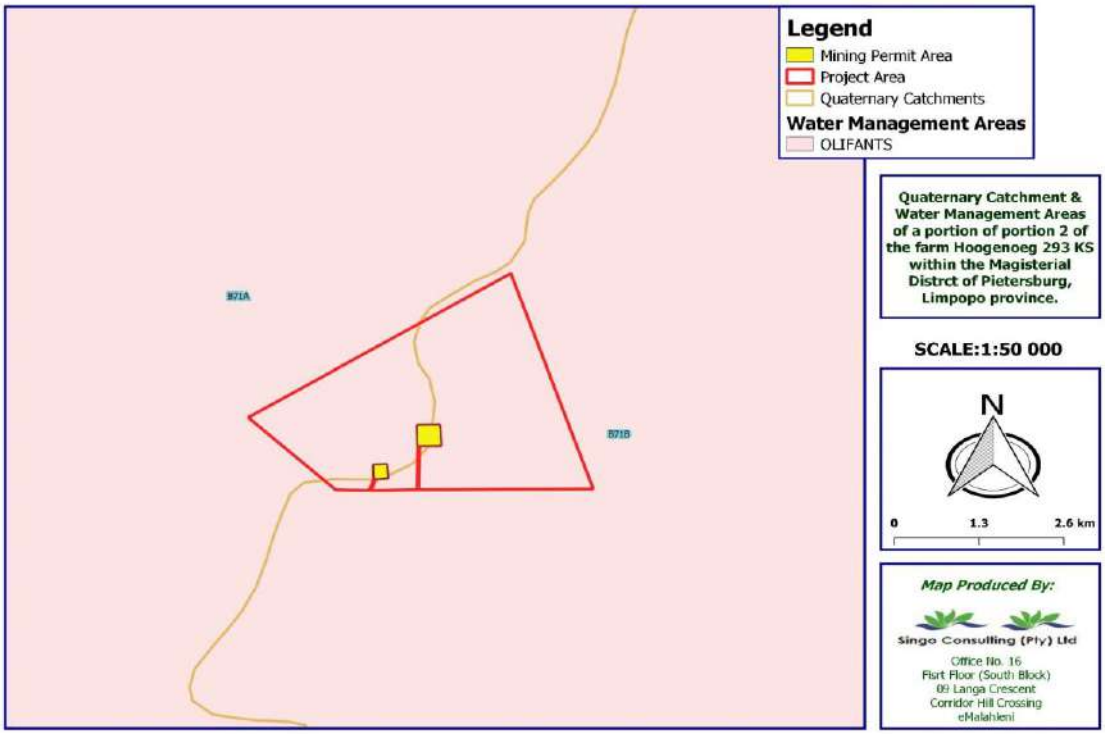
Locality map



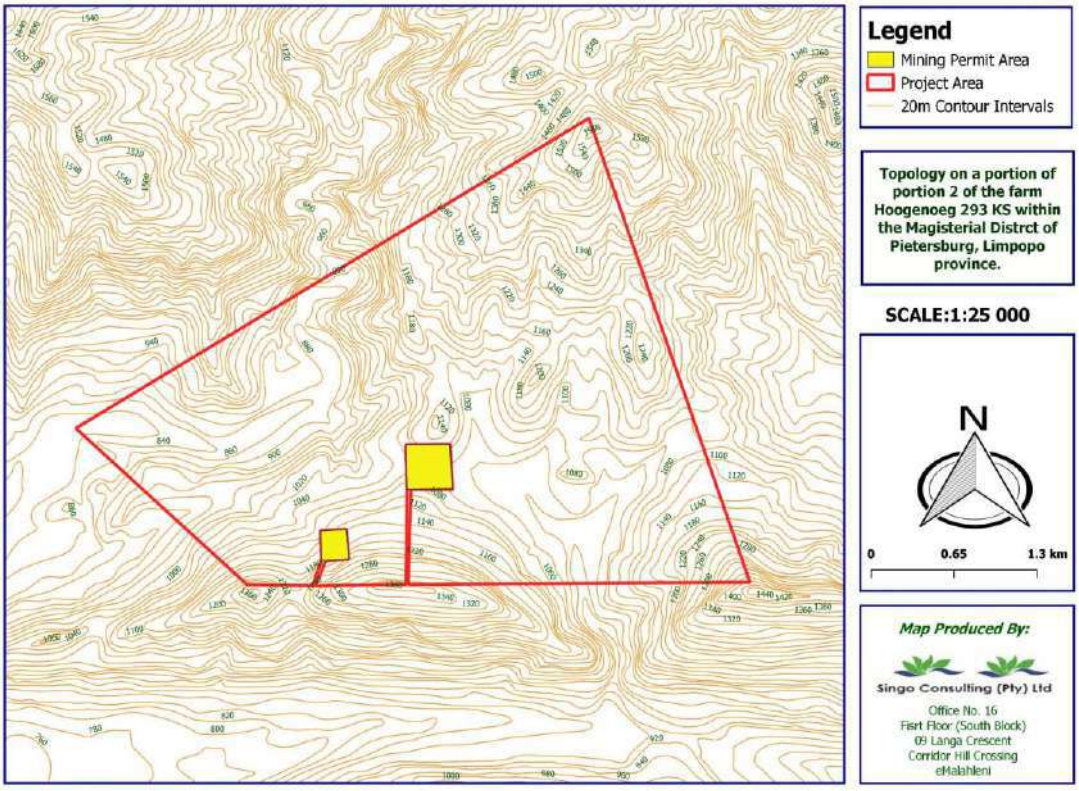
Geology map



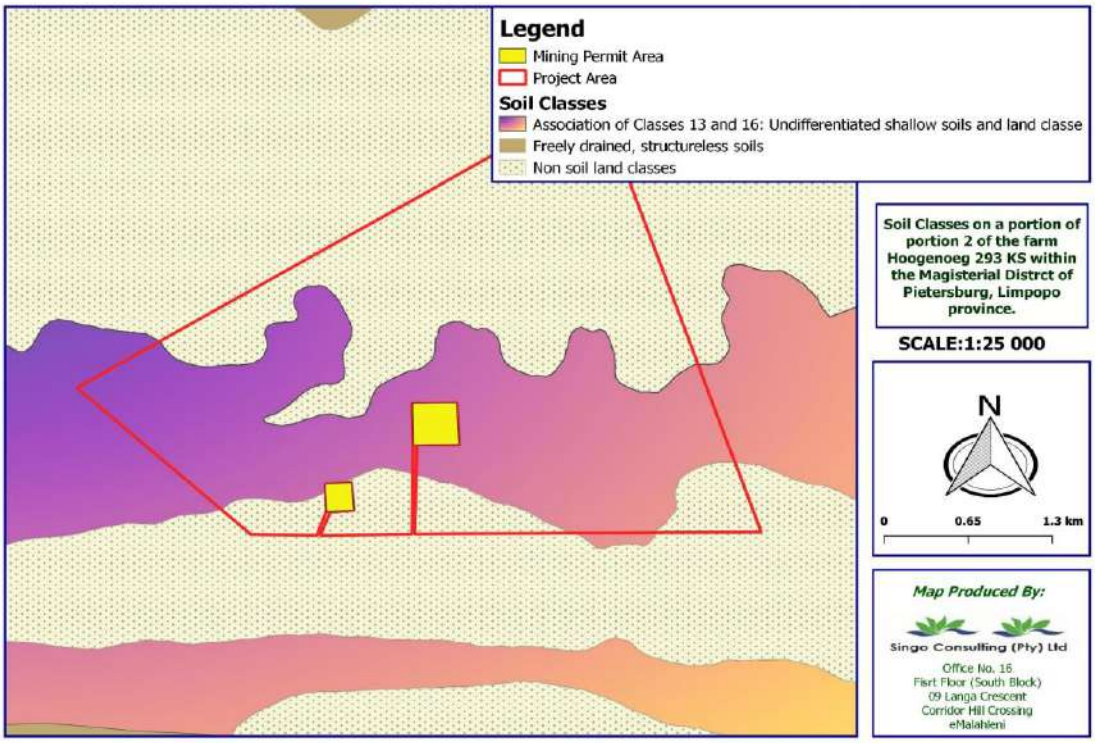
Hydrology map



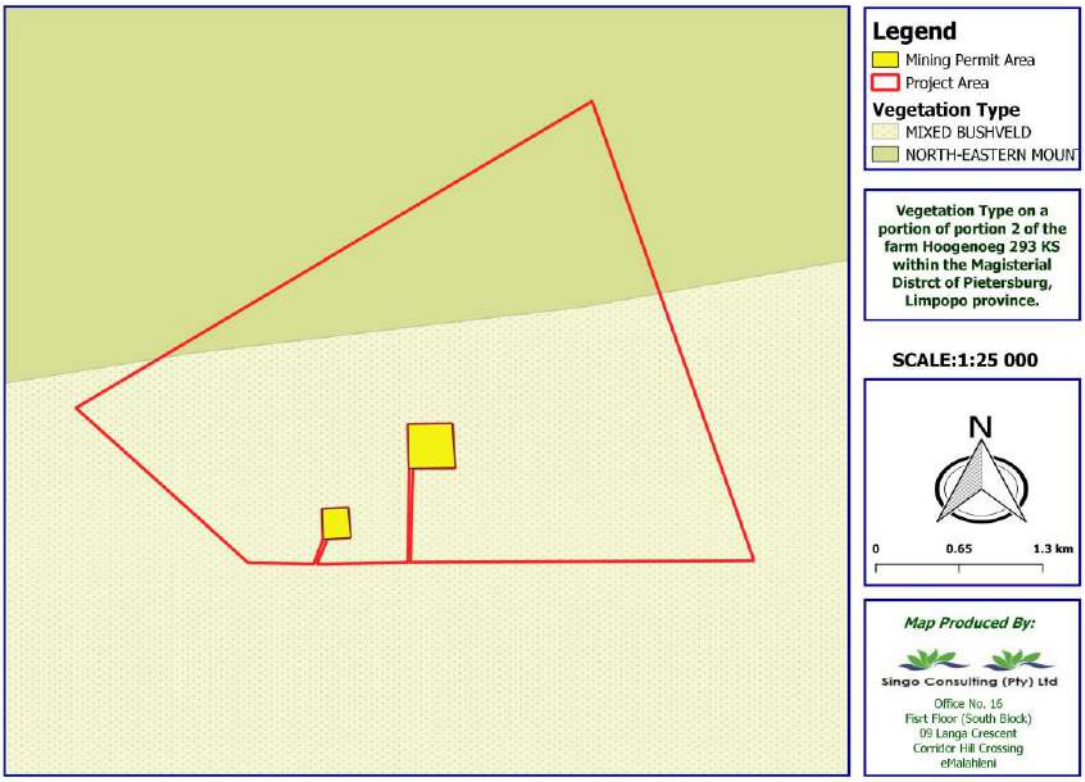
Quaternary Catchment and Water Management Areas map



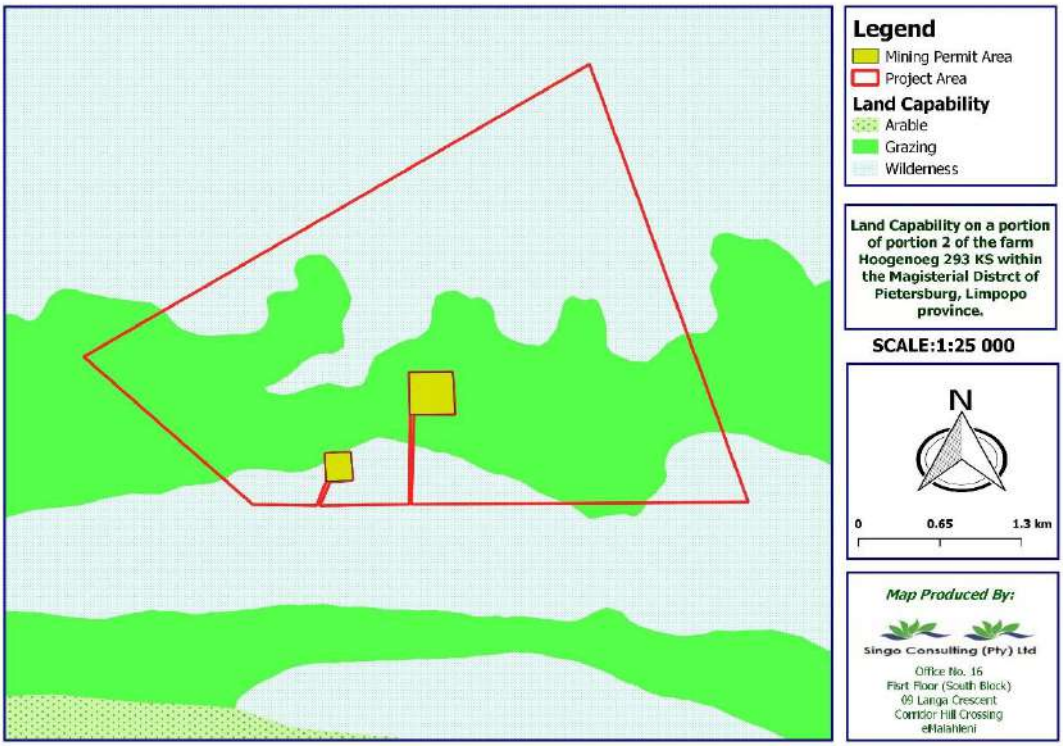
Topographical map



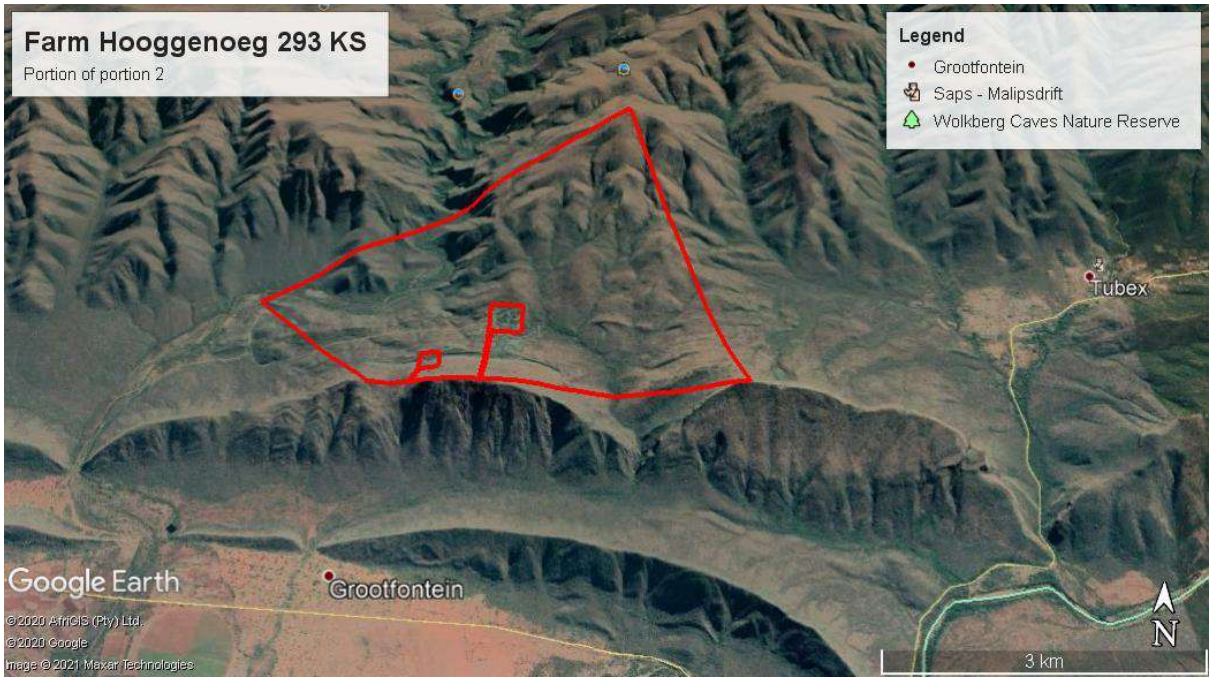
Soil classes map



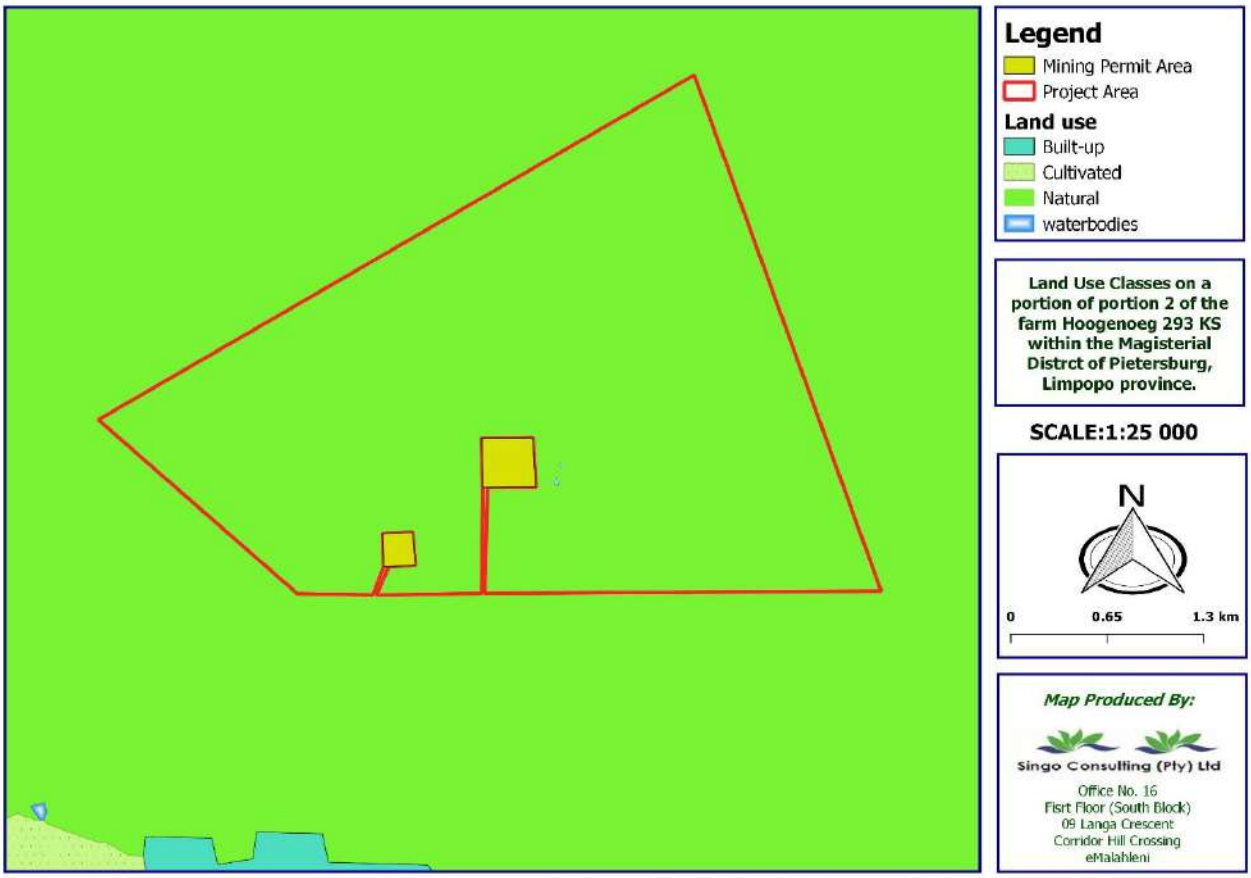
Vegetation map



Land capability map



Google Earth Map


Legend
Mining Permit Area
Project Area
Land use
Built-up
Cultivated
Natural
waterbodies
Land Use Classes on a portion of portion 2 of the farm Hoogenoeg 293 KS within the Magisterial Distrct of Pietersburg, Limpopo province.
SCALE:1:25 000
N
0
0.65
1.3 km
Map Produced By:
Singo Consulting (Pty) Ltd
Office No. 16
Fisrt Floor (South Block)
09 Langa Crescent
Corridor Hill Crossing
eMalahleni

Land use map

Appendix 4: ***Landowner list***

Printed: 2021/01/15 10:18

windeed
A LexisNexis® Product

Deeds Office Property

HOOGGENOEG, 293, 2 (LIMPOPO)

GENERAL INFORMATION

Deeds Office	LIMPOPO
Date Requested	2021/01/15 10:17
Information Source	DEEDS OFFICE
Reference	-

PROPERTY INFORMATION

Property Type	FARM
Farm Name	HOOGGENOEG
Farm Number	293
Portion Number	2
Local Authority	LEPELE-NKUMPI LOCAL MUNICIPALITY
Registration Division	KS
Province	LIMPOPO
Diagram Deed	T31705/984
Extent	1075.2618H
Previous Description	-
LPI Code	T0KS00000000029300002

OWNER INFORMATION

Owner 1 of 2

Company Type	GOVERNMENT
Name	PROVINCIAL GOVERNMENT OF LIMPOPO
Registration Number	
Title Deed	T25563/1984PTA
Registration Date	1984/05/23
Purchase Price (R)	SECT 28
Purchase Date	-
Share	
Microfilm Reference	
Multiple Properties	NO
Multiple Owners	NO

Owner 2 of 2

Company Type	GOVERNMENT
Name	PROVINCIAL GOVERNMENT OF LIMPOPO
Registration Number	
Title Deed	T79567/2015PTA
Registration Date	-
Purchase Price (R)	TRANSFER BY ENDO
Purchase Date	-
Share	
Microfilm Reference	
Multiple Properties	NO
Multiple Owners	NO

ENDORSEMENTS (3)

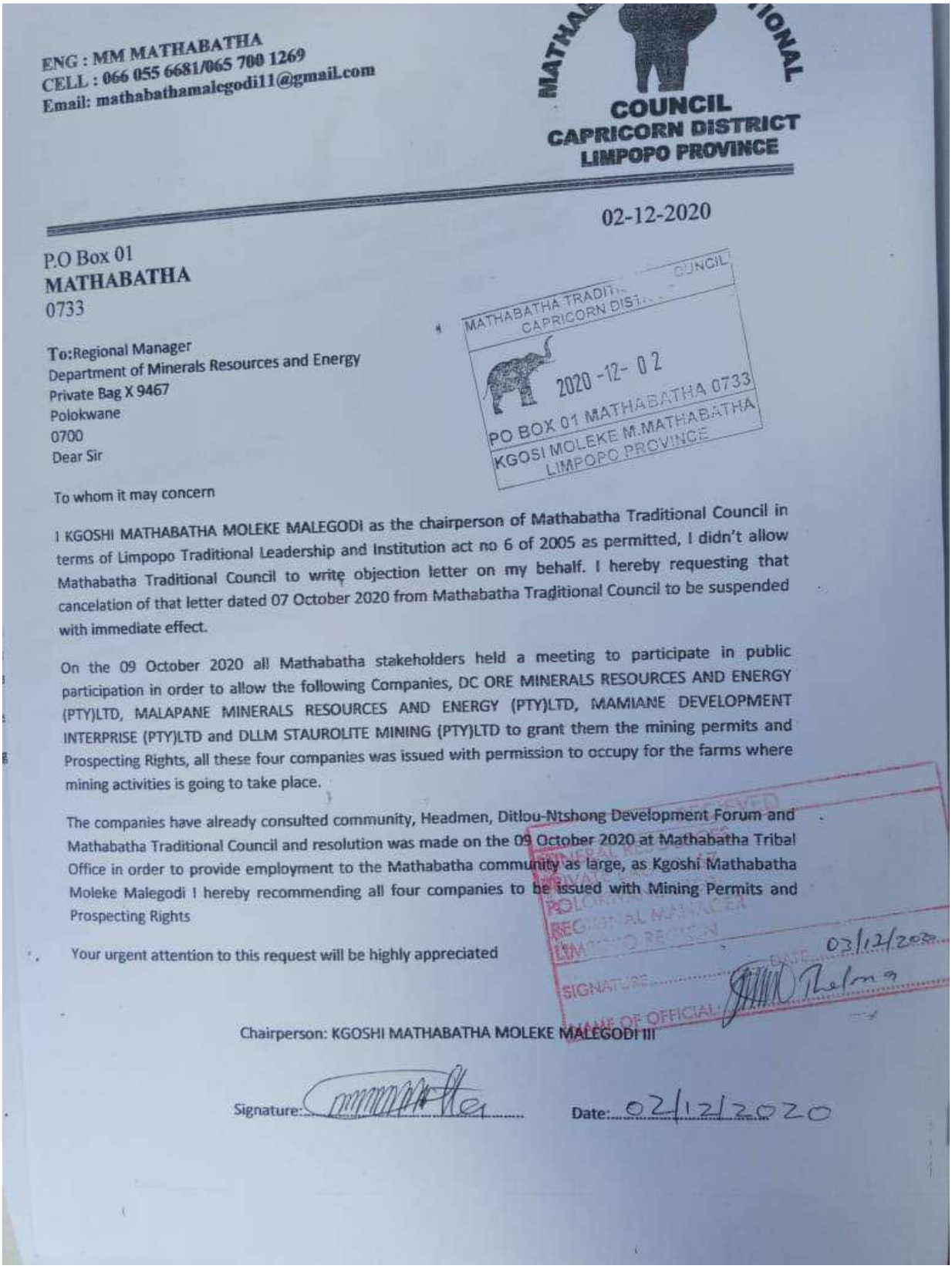
#	Document	Institution	Amount (R)	Microfilm
1	VA4137/1993PTA	K36/1970RM	UNKNOWN	
2	VA7110/2015PTA	REPUBLIEK VAN SUID-AFRIKA	UNKNOWN	
3	CONVERTED FROM PTA	-	UNKNOWN	

HISTORIC DOCUMENTS (1)

#	Document	Owner	Amount (R)	Microfilm
1	T31705/1984PTA	REPUBLIEK VAN SUID-AFRIKA	CRT	

Appendix 5: Stakeholder engagement

5A: Comments from Kgoshi Mathabatha



ENG : MM MATHABATHA
CELL : 066 055 6681/065 700 1269
Email: mathabathamalegodi11@gmail.com

COUNCIL
CAPRICORN DISTRICT
LIMPOPO PROVINCE

02-12-2020

P.O Box 01
MATHABATHA
0733

MATHABATHA TRADIT... COUNCIL
CAPRICORN DIST...
2020 -12- 02
PO BOX 01 MATHABATHA 0733
KGOSI MOLEKE M.MATHABATHA
LIMPOPO PROVINCE

To:Regional Manager
Department of Minerals Resources and Energy
Private Bag X 9467
Polokwane
0700
Dear Sir

To whom it may concern

I KGOSHI MATHABATHA MOLEKE MALEGODI as the chairperson of Mathabatha Traditional Council in terms of Limpopo Traditional Leadership and Institution act no 6 of 2005 as permitted, I didn't allow Mathabatha Traditional Council to write objection letter on my behalf. I hereby requesting that cancelation of that letter dated 07 October 2020 from Mathabatha Traditional Council to be suspended with immediate effect.

On the 09 October 2020 all Mathabatha stakeholders held a meeting to participate in public participation in order to allow the following Companies, DC ORE MINERALS RESOURCES AND ENERGY (PTY)LTD, MALAPANE MINERALS RESOURCES AND ENERGY (PTY)LTD, MAMIANE DEVELOPMENT INTERPRISE (PTY)LTD and DLLM STAUROLITE MINING (PTY)LTD to grant them the mining permits and Prospecting Rights, all these four companies was issued with permission to occupy for the farms where mining activities is going to take place.

The companies have already consulted community, Headmen, Ditlou-Ntshong Development Forum and Mathabatha Traditional Council and resolution was made on the 09 October 2020 at Mathabatha Tribal Office in order to provide employment to the Mathabatha community as large, as Kgoshi Mathabatha Moleke Malegodi I hereby recommending all four companies to be issued with Mining Permits and Prospecting Rights

Your urgent attention to this request will be highly appreciated

RECEIVED
REGIONAL MANAGER
POLOKWANE REGION
LIMPOPO REGION
SIGNATURE
DATE 03/12/2020
NAME OF OFFICIAL

Chairperson: KGOSHI MATHABATHA MOLEKE MALEGODI III

Signature:

Date: 02/12/2020

DC ORE MINERALS AND ENERGY (PTY) Ltd

REG NO: 2020 / 021857 / 07

Residential Address
Glencore Mining Supply Park
Block B16
Steelpoort
1133, R555

Postal Address
P.O.Box 667
Steelpoort
1133

Cell: 073 498 5613
0723018592
Fax: 086 539 0133
Email: carbet@webmail.co.za
:davidmokgophi@gmail.com

Date: 06 January 2021

To: DMRE LIMPOPO
Att: Mr Thivhulawi Kolani (Head of Environment)

Dear Sir

Requisition for 50 days BAR extension for submission (Ref No: 13799 EM)

DC Ore minerals and Energy hereby requesting extension of 50 days for submitting BAR on the following reasons;

1. The company could not concluded the BAR yet due to the objections which was lodged on the 07 October 2020 by Individuals and see attached documents.
2. And appeal was lodged by Ayana Group Company.

RECEIVED
MINERAL RESOURCES
PRIVATE BAG X9612
POLOKWANE 0700
REGIONAL MANAGER
LIMPOPO REGION
SIGNATURE ..... DATE 06/01/2021
NAME OF OFFICIAL

Thank you for considering our Request

Regards

Carbet Malapane

Signature----------

David Mokgophi

Signature----------

5B: Attendance registers from community meetings

: CHAIRPERSON
: 072 241 3292
072 301 8592

DITLOU NTSHONG

BUSINESS FORUM — ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

①

MATHABATHA DEVELOPMENT FORUM

Community meeting/Public participation

Venue: DNDF Company: DC ORE MINERALS AND ENERGY Date: 18-02-2020

DITLOU-NTSHONG DEVELOPMENT FORUM
18-02-2020
P.O. BOX 63, MATHABATHA. 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

Number	Surname & Name	Contact	Village	Signature
1	Mahlatji Phineas	0825907186	Roma	
2	Mokobejane Lindelo	0766 124 322	Madiketeng	
3	Motome Maplalle	0767624673	Masioneng	
4	Ngoake Koketso	0827 444 862	Sodoma	
5	George Digoma	0712664837	Madiketeng	
6	Dekh Thelo	0715012199	Mahlatjie	
7	Seikgobela Tumelo	0796398346	Success	
8	Mampa Happy	0780528033	Madiketeng	
9	Lopsa Mahlatji	0792585425	Tiger	
10	Mathabatha Samuel	0818892547	Mmashadi (G.G)	
11	Maphosa William	0646032273	Mmashadi (G.G)	WiMaphosa
12	Mathabatha Ndelolo	0660711189878	Mmashadi (G.G	
13	Mmathabatha Nape	0761229448	Mmashadi G.G	
14	" Evence	0712231345	Mmashadi G.G	
15	Mabaso Cotten	0827432245	Mmashadi G.G	
16	Makgaretsa Lekgotho	0769025241	Roma	
17	Teka Harris	0714820591	Masioneng	
18	Mlobane Mafenye	0727638868	Madiketeng	

②

: CHAIRPERSON
: 072 241 3292
072 301 8592

DITLOU — BUSINESS FORUM

NTSHONG — ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM

Community meeting/Public participation

Venue: DTDF Company: De Ore Minerals and Energy Date: 18 - 02

DITLOU-NTSHONG DEVELOPMENT FORUM
18 -02- 2020
P.O. BOX 63, MATHABATHA, 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

Number	Surname & Name	Contact	Village	Signature
1	Mahlagi Seneki	0738403042	Phaswena	[illegible]
2	Mkesi Georgina	0729278465	Masioneng	[illegible]
3.	Sebatha Bedrah	0796053632	Madikeleng	[illegible]
4.	Chidi Mavis	0764379978	Madikeleng	[illegible]
5.	Mathabatha Florah	0826815184	Madikeleng	[illegible]
6.	Phasha Irene	079 453 1054	Success	[illegible]
7	Digama Aromotso	0820658679	Madikeleng	[illegible]
8	Moloadne Winny	0795921003	Madikeleng	[illegible]
9.	Mathabatha Edwin	0829325475	Roma	[illegible]
10	Marema Tiisetso	072 7522 481	Madikeleng	[illegible]
11	Kgasago Kgaogelo	0725229880	Madikeleng	K.Kgasago
12	Kgasago Salome	0725135669	Madikeleng	S.Kgasago
13	Phoka Mahlatse	072 858 3558	Ga-Makgoba	[illegible]
14	Mangla Mercy	0797892755	Madikeleng	[illegible]
15	Kgasago Mmotegi	0794 850 856	Madikeleng	[illegible]
16	Kgasago Sharon	0720159907	Madikeleng	K.S
17	Molokwane Mmabatho	072 511 0301	G.G	[illegible]
18	Thokwane Julia	0711487336	G.G	M.J

③

: CHAIRPERSON
: 072 241 3292
072 301 8592

DITLOU — BUSINESS FORUM

NTSHONG — ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM

Community meeting/Public participation

Venue: DNDF Company: IDC ORE MINERALS AND ENERGY Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
	Makgai Ashla	0760801041	Matatane	[illegible]
	Digama Anusler	0795650393	Tlase	R.A Digama
	Kgasogo Sylvia	072 612 4415	Madikeleng	[illegible]
	Ranogaie Thabile	0729963523	Tlase	T. Ranogaie
	Mawudi Dineo	076 3361192	Roma	D.J.M
	Tebogo Makokwane	0712131776	Roma	T. Mokokwane
	Abitha Mohale	0826907168	Roma	[illegible]
	Sebeka Lwelandla	072323 3410	Madikaleng	[illegible]
	Kgasoo Malebetsa	072 4747559	Madikaleng	[illegible]
	Kgomoosebana Phelladi	012 807 2042	G.G	M.PC
	Kgomoesoma Lerato	0607312195	G.G	[illegible]
	Kgasago Virginia	071 496 2327	G.G	m.v kgasago
	Malepe Bontle	072 354 2546	G.G	M.B
	Regina Tshesonga	0765458127	Matatane	R. Tsishonga
	Chidi Maria	082 6772727	Madikeleng	[illegible]
	Motebejane Malepo	0820619286	Madikeleng	Motebejane
	S. Mamankulu	0729356146	G.G.	S.M
	Mogalodi M.	0765348369	Mahlatjane	[illegible]

DITLOU-NTSHONG DEVELOPMENT FORUM
18-02-2020
P.O. BOX 63, MATHABATHA, 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

CHAIRPERSON
072 241 3292
072 301 8592

DITLOU — BUSINESS FORUM

NTSHONG — ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM
Community meeting/Public participation

Venue: DMDE Company: DC ORE MINERALS AND ENERGY   Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
1	Baloyi Joseph	0828317734	S.S	
2	Shadrack Kgwenyo	076 864 3140	Siafeng	
3	Mahlatlwane Joel	0763149235	Makgoba	
4	Mahlabetla T.V	0713420762	Metatane	
5	Mahlati Moeti	0760659072	Roma	
6	Mathabatha Tshepo	079 863 3858	Roma	
7	Aubrey Milanzi	076 1033320	G G	
8	Tsetso mokgaretsa	0763413744	success	
9	Mosebo Jan	0799879271	setaseng	
10	Mahlati Keletso	0823566881	Kweeng	
11	Moheri Jack	0765906656	Phasweng	
12	Tabogo Mahlakoane	0829528486	Marttetane	
13	Kgosago Jack	0721786529	Roma	
14	Makote CHIDI	+	moi	
15	Mosane Ernest	0725558634	Modikeleng	
16	Sophe Thabo	0156883384	Mobikeleng	
17	Maponi Kgosago	0768942700	Madi keleng	
	Mohuba Florinah	0661398057	Baduluulo	

DITLOU-NTSHONG
DEVELOPMENT FORUM
18 -02- 2020
P.O. BOX 63, MATHABATHA. 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

(5)

: CHAIRPERSON
: 072 241 3292
072 301 8592

DITLOU NTSHONG

BUSINESS FORUM — ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM
Community meeting/Public participation

Venue: DMDF - Company: DC ORE MINERALS AND ENERGY Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
	Clyde Ceatra	076669816	Ploslowany	[signature]
	Magoale M- C.	0761848650	Sekgoseng	[signature]
	MAKGAI MORAPANENG	0712330177	MASIONENG	
	Lucas Makgai	0823712860	Mathabatha	M.MAKGAI
	L Kgasago	0824791068	Roma	L.Kgasago
	[signature] Masedi	0726515458	Motsotatse	[signature]
	Nkuna Maphosa	0763734923	G.S	[signature]
	TSKA Sephehle	0722596614	30 Gutteltwe Co	[signature]
	Magosane Kinse	0815590150	"	[signature]
	Makgaleera EDWARD	076 555 8902	Roma	[signature]
	Vincent DEKA	082 612 7451	Roma	[signature]
	Peter Kgasago	0761916600	Hlase	[signature]
	Mabusa Harry	076 9464 991	Stasang	[signature]
	Mabusa Thapson	0738331777	Kuceng	J.Mabusa
	Mashoene Makram Kgasago	0606074018	Madiseleng	[signature]
	David Mangwe		Maje	[signature]
	Kgosago Ophyi a	0762592663	Success	[signature]
	Margareta Veron	0799035159	Roma	[signature]

DITLOU-NTSHONG
DEVELOPMENT FORUM
18 -02- 2020
P.O. BOX 63, MATHABATHA, 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

⑥

: CHAIRPERSON
: 072 241 3292
072 301 8592

DITLOU BUSINESS FORUM — **NTSHONG** ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM
Community meeting/Public participation

Venue: DMDE Company: DC ORE MINERALS AND ENERGY Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
1	Mpho Moela	0766968733	Llase	R.m moela
2.	Bupeni Mabesa	0725107884	Kweeng	Mabesa MT
3.	ELIZABETH CHIDI	0822287651	Success	E.R CHidi
4.	Maphosa Nozalik	0729278686	ga-Makgoba	[illegible]
5.	Mmabatu Mosenetja	079 418 3959	Madikeleng	Mmasenetja.
6.	Mathabatha Johanna	072 599 2290	Llase	[illegible]
7.	Anna Thobejane	071 082 0711	G.G	A.Thobejane.
8.	Sophy Mampa	071 54 99670	Success	S.c mampa
9.	Sebetha Katlego	0726282781	madikileng	S.k
10.	Masego Maggie	082 [illegible]	"	[illegible]
11	Kgasago Shirley	0760111579	G.G.	[illegible]
12.	Rapulana Margatsa	0797858607	Tiase	M.P Rapulana
13	Digama Khalofelo	071 20 22 819	Malikeleng	Digama K.R
14.	Mahlagi Rose	072 7394200	Kweeng	[illegible] R.R
15.	Thobejane Melida	079 7625939	Tiase	Thobejane
16.	Kgasago Dimakatso	0713244697	Setaseng	D.D Kgasago
17.	Deka Anelina	072 7278437	Madikeleng	Deka
18.	Makgoatsa Martha	0767355690	Madikeleng	Makgoatsa.

DITLOU-NTSHONG
DEVELOPMENT FORUM
1 8 -02- 2020
P.O. BOX 63, MATHABATHA, 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

: CHAIRPERSON
S: 072 241 3292
072 301 8592

DITLOU NTSHONG

BUSINESS FORUM — ENGAGEMENT STRUCTURE

(7)

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM
Community meeting/Public participation

Venue: DMDF Company: DC ORE MINERALS AND ENERGY Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
1	Mamokgopa Tumisho	0723470738	Tiase	[illegible]
2	Mosehlare Resimah	0767395055	Tiase	R.R. Mosehlare
3	Phogole Sharon	0760818418	Madikeleng	Phogole
4	Setala Vanessa	079 5678 065	Madikeleng	[illegible]
5	Mabusa Thakgotso	0664060256	Lekgwareng	[illegible]
6	Phogole Koppotso	064 606 4178	Madikeleng	[illegible]
7	Palesa Rammala	0764989225	~~[illegible]~~ Roma	[illegible]
8	Phasha Yvonne	0825928114	Roma	[illegible]
9	mmatseleng kgasago	0790166595	Roma	K.M
10	Mahlomoleng Molokoane	083 7257 228	GG.	M.Molokoane
11	Phasha Tshepo	072 8451679	Roma	Phasha.T
12	Chabalala Morgadi	0822666491	G.G	[illegible]
13	Chabalala Paulina	0823282994	G.G	P.C
14	Mathabatha Lebogang	0794144036	Phaswing	Mathabatha
15	Mogosoana Ouma	073 888 0818	Phaswing	Mogosoana
16	Mahlatji Thabang	076 1496 071	Phalwing	T [illegible]
17	Chidi Thoriso	076 9735 627	Kweeng	Chidi
18	Mahlatji Tshepho	071 277 3568	phaswing	Mahlatji

DITLOU-NTSHONG
DEVELOPMENT FORUM
18 -02- 2020
P.O. BOX 63, MATHABATHA. 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

: CHAIRPERSON
: 072 241 3292
072 301 8592

DITLOU BUSINESS FORUM — **NTSHONG** ENGAGEMENT STRUCTURE (8)

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM
Community meeting/Public participation

Venue: DNDF. Company: ORE MINERALS AND ENERGY (PTY) LTD Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
	Mosehlana Lethabo	060 8000 591	Tlase	L.R.
	Magwale Valecia	076 5485 587	Tlase	P.V
	Francina Thabejane	079 7292608	Madikeleng	F.O
	Ramogalle Kate	072 774 8522	Madikeleng	R. Ramogalle
	Molokoane Outa	0761115412	Tlase	[illegible]
	Rammalo Eunice	0723901497	Madikeleng	[illegible]
	Moletsa Vanecia	079 847 0850	Madikeleng	[illegible]
	Rapikana Henry	0790198263	Tlase	[illegible]
	Mabokane Michael	0823253817	Sekgweng	[illegible]
	Mampa Tilly	072194 3239	Mphaaneng	[illegible]
	Mampa Nkhabi	082 5477 942	"	[illegible]
	Molokoane Leah	079 6141463	Mashilweng	[illegible]
	Sehebhla Mogau	0660283914	Madibeleng	[illegible]
	Mosa Thobejane	0711489336	9.9	M.T
	Molokoane Mmabatho	079 511 0301	"	M Molokoane
	Ramaila Victoria	079 022 9618	Matsopa	[illegible]
	Kgosago Mpho	0726931025	Kgweng	[illegible]
	Segabo Linda	0644941766	Manaoreng	[illegible]

DITLOU-NTSHONG DEVELOPMENT FORUM
18-02-2020
P.O. BOX 63, MATHABATHA. 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

(10)

: CHAIRPERSON
S : 072 241 3292
072 301 8592

DITLOU — BUSINESS FORUM

NTSHONG — ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM

Community meeting/Public participation

Venue : DMDF - Company: DC ORE MINERALS AND ENERGY Date : 18-02-2020

Number	Surname & Name	Contact	Village	Signature
	Mogoale Tshidi	0721823364	Sekaseng	[signature]
	Mogoale Shocky	0722127027	Sekaseng	[signature]
	Mogoale Senny	0725329528	Sekaseng	[signature]
	[illegible]	0726209845	TIASE	[signature]
	Mahlodu Mahlase	082 5057552	Phelwing	[signature]
	Maseme Mogosoane	0767114603	Phelwing	[signature]
	Deka Shongile	0827115443	Motodane	[signature]
	Makgai Promise	072828491	Motodane	[signature]
	Jonson Lindiwe	0792732901	mPhaaneng	[signature]
	Manipa Rehabile	0793464439	Ga-makgoba	[signature]
	Mokgophi Calvin	0129836839	mphaaneng	[signature]
	Mokgophi Pinky	0762569488	mphaaneng	[signature]
	Kgasago Patricia	0798424844	Kareeng	[signature]
	[illegible]	0659806427	[illegible]	[signature]
	Mampa [illegible]	0605556106	Matatane	[signature]
	Kgasago Kgaugelo	0661544578	Matatane	[signature]
	Kgasago Conny	0764661249	Matatane	[signature]
	Kgasago Ribby	0713094715	TIASE	[signature]

DITLOU-NTSHONG
DEVELOPMENT FORUM
18 -02- 2020
P.O. BOX 63, MATHABATHA. 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

: CHAIRPERSON
rs : 072 241 3292
072 301 8592

DITLOU NTSHONG

BUSINESS FORUM — ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM
Community meeting/Public participation

Venue DMDF - Company: DE ORE MINERALS AND ENERGY (PTY) LTD Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
1.	Phasha Tuapelo	0724039918	Success	Phasha T.L
2	Tshishonga Bridget	0828368785	Malatane	[illegible]
3	Mampa Nkele	0761591382	Madikeleng	[illegible]
4	Thabitha Sepuru	0760173795	Success	T.Sepuru
5	Teka Thandeka	0721605798	Roma	T.G Teka
6	Mosehlana Tebatso	076 083 0670	Roma	[illegible]
6	Mogosoane Bonny	0660 307446	Tlase	B.Mo[illegible]
7	Moguale Emmae	0793516065	Matetane	E.P. [illegible]
8 -	Mathabatha Sesile	0794865076	G G	Sesile
9	Mathabatha Evelyn	079 048 6845	G.G	E.Mathabatha
10	Kgasago Philidwe	0748924403	Kweeng	[illegible]
11	Kgasago Khomotso	072024 7281	Ga-Makgoba	Kgasago
12	Kgasago Itumeleng	0767096968	Matatane	Kgasago I.M
13	Kgasago Kganugelo	0646807752	Roma	Kgasago K.T.
14.	Mathabatha Koketjo	076 561 4415		
15 -	Maroba Precious	0764899799	Success	[illegible]
16.	Mankwe Lizzy	082 538 9866	Success	[illegible]
17	Mogotle Dineo	0711231433	Success	Dmogotle

DITLOU-NTSHONG DEVELOPMENT FORUM
18 -02- 2020
P.O. BOX 63, MATHABATHA. 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

(12)

: CHAIRPERSON
'S : 072 241 3292
072 301 8592

DITLOU BUSINESS FORUM **NTSHONG** ENGAGEMENT STRUCTURE

MOSHATE WA GAMATHABATHA
P O BOX 01
MATHABATHA
0733

MATHABATHA DEVELOPMENT FORUM

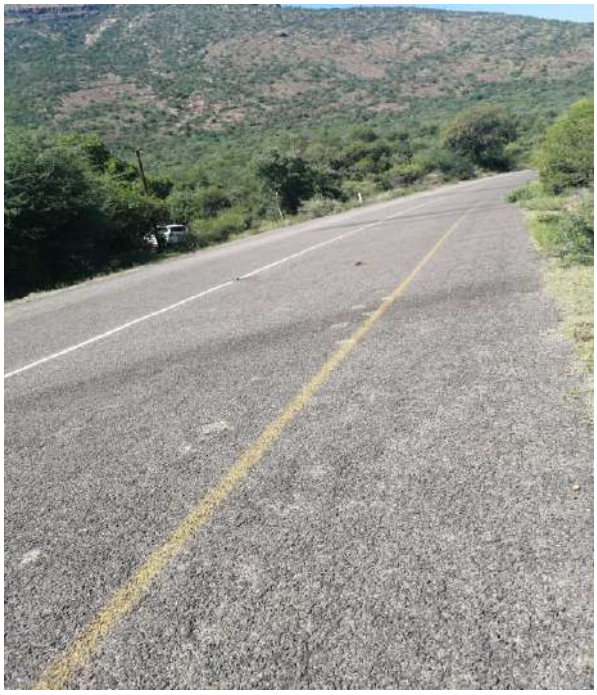
Community meeting/Public participation

Venue: DMDP – Company: DCORE MINERALS AND ENERGY (PTY) LTD Date: 18-02-2020

Number	Surname & Name	Contact	Village	Signature
1	Phogole Hlomogolo	0726089604	madikeleng	[signature]
2	Lethabo TEK		Madikeleng	[signature]
3	Sciesho Tony	0646403350	madikeleng	[signature]
4	CHIDI Mack	0825619276	MaDikeleng	DLIM CHIDI
5	Ramahla Jonathan	072 5581389	madikeleng	R.M.S
6	CHIDI Pitso	0736109082	madikeleng	[signature]
7	Makgareetja Maiwale	0796252952	Madikeleng	[signature]
8	Mathabatha Lawrence	0760273613	Madikeleng	[signature]
9	MAHLATJI ABEL	0729193168	PHASWENG	[signature]
10	Kgasago Kopano	0668786107	Sgaseng	[signature]
11	Thobela Hani	0726160911	Matatane	[signature]
12	Kgasago WRIGHT	0647951096	Matatane	[signature]
13	Kgasago JAMES	072 0704608	Mototape	[signature]
14	Mokgophi David	0723016592	Phageng	[signature]
15	Lawrence Maselela	076 100 8592	Succeed	[signature]
16	Mohlahane Rekudi	0743707483	Succ	[signature]
17	Kgasago mabuti	0715059788	Suite	[signature]
18	Kgasago Hunter	072216 4407	Simeng	[signature]

DITLOU-NTSHONG DEVELOPMENT FORUM
18 -02- 2020
P.O. BOX 63, MATHABATHA, 0733
KGOSHI MOLEKE-MALEGODI MATHABATHA

Appendix 6: Pictures depicting the current conditions and infrastructures on site



Appendix 7: Financial Provision

CALCULATION OF THE QUANTUM

Applicant: DC Ore Minerals and Energy
Evaluator: Deshney Mapoko

Ref No.: LP 30/5/1/1/2/13799 PR
Date: Jan-21

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 powerlines)	m3	0	16	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	228	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	336	1	1	0
3	Rehabilitation of access roads	m2	300	41	0,03	1	369
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	395	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	216	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	455	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	238697	1	1	0
7	Sealing of shafts adits and inclines	m3	0	122	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	159131	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	198195	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	575653	1	1	0
9	Rehabilitation of subsided areas	ha	0	133249	1	1	0
10	General surface rehabilitation	ha	0,9	126059	0,3	1	34035,93
11	River diversions	ha	0	126059	1	1	0
12	Fencing	m	0	144	0,5	1	0
13	Water management	ha	0	47931	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	16776	1	1	0
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		34404,93

1	Preliminary and General	4128,5916	weighting factor 2 1	4128,5916
2	Contingencies	3440,493		3440,493
			Subtotal 2	41974,01
			VAT (15%)	1500,15
			Grand Total	43474

SIGN
DATE

Deshney Mapoko
2021/01/16

Appendix 8: Specialist studies

Appendix 9: EA Form

BASIC SOIL STUDY

DETAILED SOIL STUDY FOR CHROME ORE, COPPER ORE, ANDALUSITE, SILLIMANITE AND IRON ORE IN RESPECT OF THE FARM HOOGGENOEG 293 KS UNDER THE MAGISTERIAL DISTRICT OF LEPELLE-NKUMPI.

DMRE REF: LP 30/5/1/1/2/13799 PR

APPLICANT

DC ORE MINERALS AND ENERGY

REPORT COMPILED BY

Singo Consulting (Pty) Ltd

Office No. 16, First Floor (South Block)
Corridor Hill Crossing, 09 Langa Crescent
Corridor Hill, eMalahleni, 1035.

Tell No.: 013 692 0041
Cell No.: 072-081-6682/078-2727-839
Fax No.: 086-514-4103

E-mail address: kenneth@singoconsulting.co.za

2021

REPORT INFORMATION

Soil study for the Chrome ore, Copper ore, Andalusite, Sillimanite and Iron ore prospecting right application and environmental authorization application for DC Ore Minerals and Energy with an extent of approximately 1054,875244 ha on the Farm Hooggenoeg 293 KS situated under the Lepelle Nkumpi Local Municipality, Limpopo Province.

REQUESTED BY

DC ORE MINERALS AND ENERGY

COMPILED BY

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1. Introduction

Singo Consulting (Pty) Ltd was appointed by DC Ore Minerals and Energy to conduct a soil study for the Prospecting Right Application which has been submitted for the prospecting of Chrome ore, Copper ore, Andalusite, Sillimanite and Iron ore with an extent of approximately 1054, 875244 ha on the Farm Hooggenoeg 293 KS situated under the Lepelle-Nkumpi Local Municipality, Limpopo Province

1.1 Project background

A locality map created by QGIS software illustrates detailed and comprehensive information regarding the surrounding settlements and infrastructure of the proposed project area. A locality map created by QGIS software illustrates detailed and comprehensive information regarding the surrounding settlements and infrastructure of the proposed project area. The proposed project area is located approximately 15.69 km North East of Bogalatladi and approximately 5.57 km North West of Tubex.

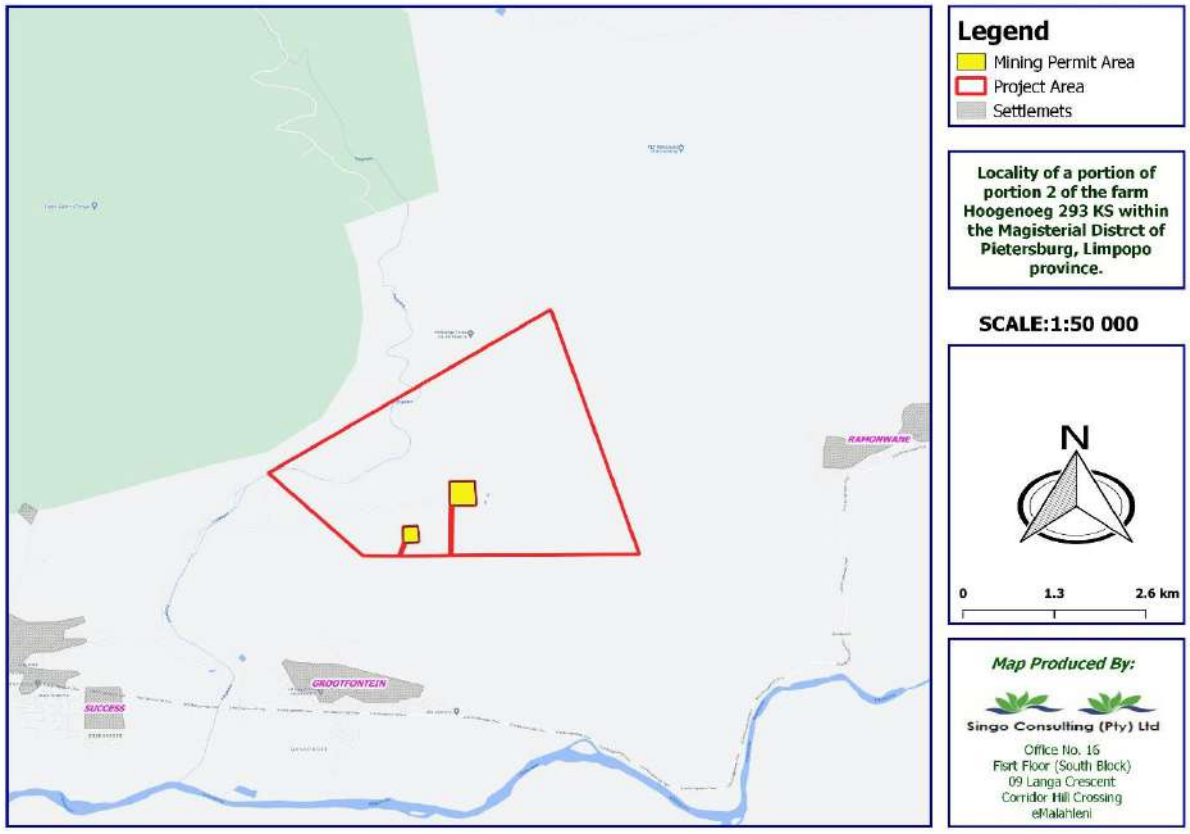

Figure 1: Locality map

1.2 Topography and drainage

Topography is the study of the shape and features of land surfaces. The topography of an area could refer to the surface shapes and features themselves, or a description (especially their depiction in maps). Topography is a field of geoscience and planetary science and is concerned with local detail in general, including not only relief but also natural and artificial features, and even local history and culture. This meaning is less common in the United States, where topographic maps with elevation contours have made "topography" synonymous with relief.

The slope within and around the project area is not uniform and this is evident by the contour lines which are neither evenly nor parallel spaced. The proposed prospecting area is situated within a region characterized hills topography of the farm Hooggenoeg 293 KS. This can be observed on the topology map attached below as the altitude is generally on average of 840-1550 metres above sea level. See Figure 2 below.

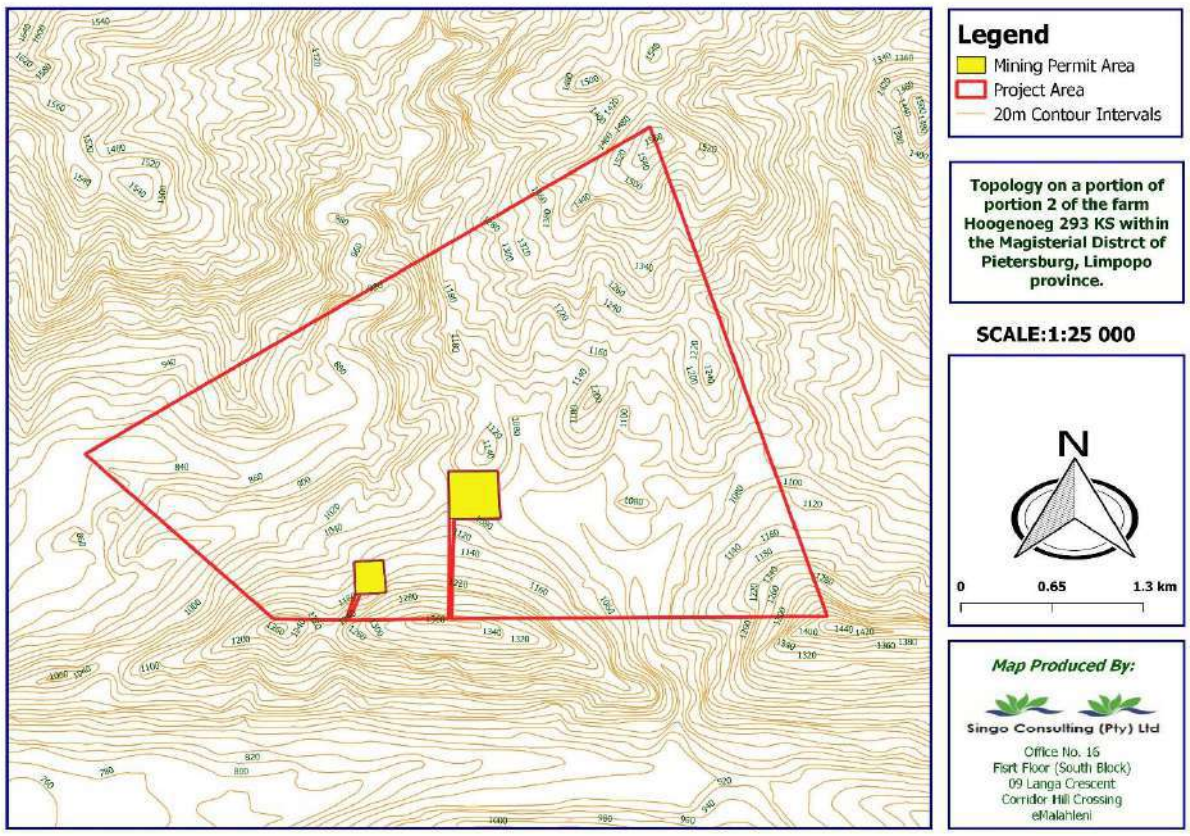

Figure 2: Topography of the prospecting right area

2. Study Objectives

The study objectives were to:

- Conduct a basic soil assessment of the proposed prospecting right project
- Determine soil assessment impacts of the proposed Chrome ore, Copper ore, Iron ore, Andalisite and Sallimanite prospecting activity and provide associated mitigation measures.
- Classify and map soil forms according to the South African Taxonomic Soil Classification System, 1991
- Derive and map land capability based on soil properties
- Map all current land uses

3 Project Description

The prospecting right activity will be carried out in five (5) phases namely:

Phase 1: Non-Invasive Prospecting: - Desktop Study - Analysis of Existing Data GIS & analytical desktop studies Surveys.
Phase 2: Non-Invasive Prospecting: - Multi-Spectral and Aerial Surveys
Phase 3: Invasive Prospecting: - Reconnaissance Borehole drilling, Sampling and Analysis.
Phase 4: Invasive Prospecting: - Resource drilling, Sampling and Analysis, Resource Estimation and Pre-Feasibility Study.
Phase 5- Feasibility Studies

Since exploration is temporary in nature no permanent structures will be constructed, negotiations and agreements may be made with the farm owners to use any existing infrastructure like access roads. No accommodation will be provided on site.

The figure below illustrates the basic conceptual model of the area to be disturbed during the prospecting period per drilled borehole.

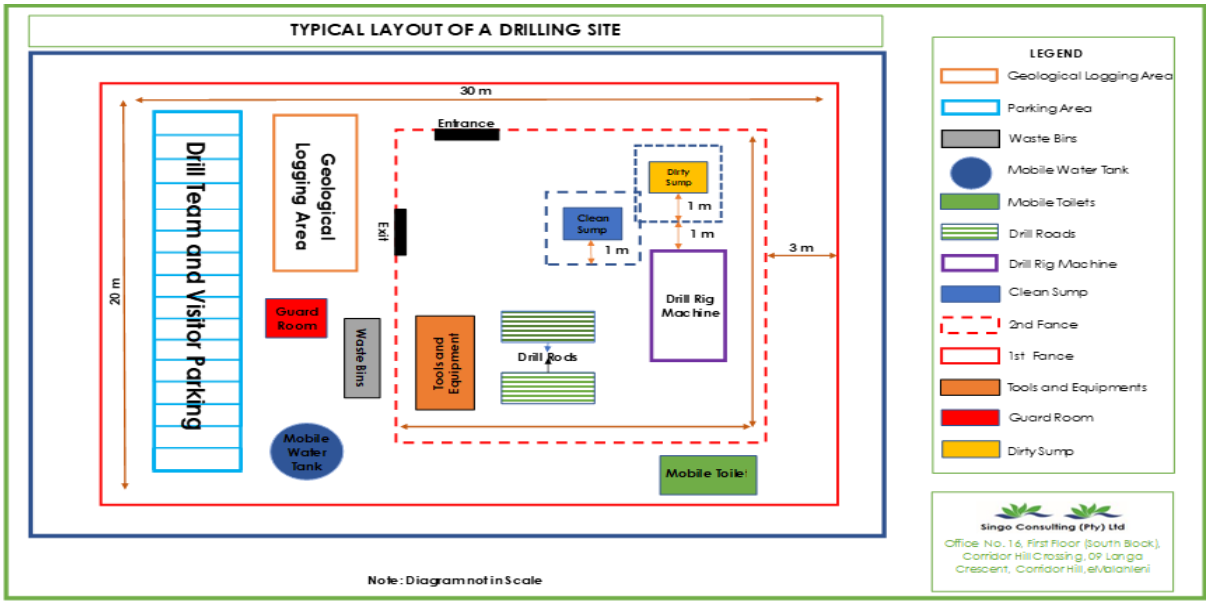

Figure 3: General Layout for prospecting area activities.

4 Soil survey Methodology

4.1 Soil survey procedures

This allows soil surveyors to enter the project area and study colour, texture, structure, and other soil properties as well to differentiate between horizons. This allows for classification. Chemical tests can be carried out in the field (e.g. pH, test for carbonates and test for Mn oxides). Classification is done at this stage, which provides information on the chemical, physical and mineralogical characterization of the soil. Soil scientists that map the area, familiarize themselves with soils they expect to find and use characteristics to distinguish them from other soils in the area by doing desktop study.

Delineating soil boundaries

To avoid digging random soil pits with an auger, a map of the area will be taken, and a grid will be made on the map to determine where samples will be taken from. An efficient soil mapper looks at changes in vegetation, topography, and soil colour. A bare soil map can also be looked at to see where changes in colour occur indicating differences in soil. Once the project area is established, an auger will be used to dig holes in order to determine the soil profiles.

4.2 Soil and land capability

Land capability depends on soil capability in combination with climate. The land capability depends on soil depth which was determined at soil survey positions. Survey positions were recorded as waypoints using a handheld (Global Positioning System (GPS)).

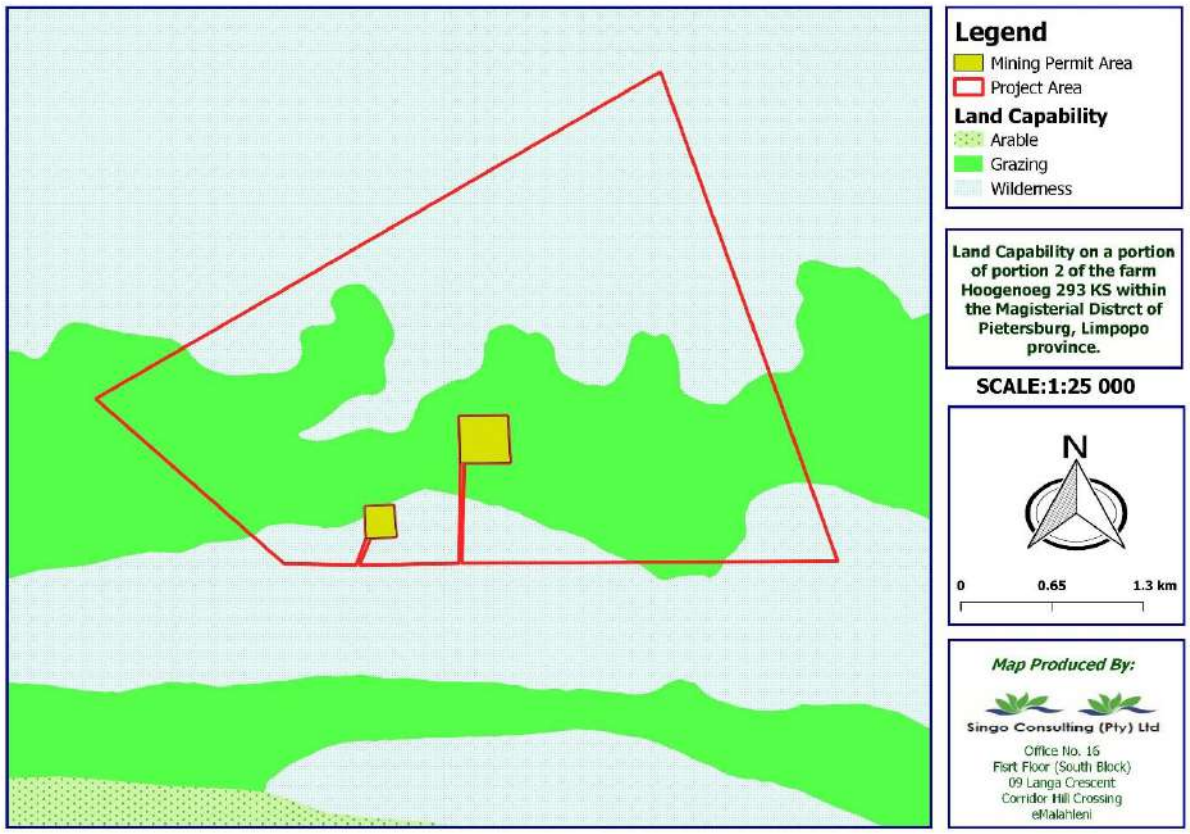

Figure 4: Land capability within the proposed project

4.3 Structure of the SA classification system

- Procedure to follow when identifying a soil:
- Demarcate master horizons in profile.
- Identify diagnostic horizons/materials.
- Establish soil form
- Identify family differentiae.
- Establish soil family.
- Determine textural class.

4.4 Environmental Impact Assessment

The impact rating process is designed to provide a numerical rating of the various environmental impacts identified using the Input-Output model. it must be stressed that the purpose of this process is not to provide an incontrovertible rating of the significance of various aspects, but rather to provide a structured, traceable and defendable methodology of rating the relative significance of impacts in a specific context. This gives the project proponent a greater understanding of the impacts of this project and the issues which need to be addressed by mitigation and give the regulators information on which to base their decisions.

The significance rating process follows the established impact/risk assessment formula:

Significance= Consequence x Probability

Where

Consequence = Severity + Spatial Scale + Duration

Probability = Likelihood of an impact occurring

The matrix calculates the rating out of 147, whereby Severity, Spatial Scale, Duration and Probability are each rated out of seven as indicated in Table 1. Weighting can be applied to the various parameters.

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in the Environmental Management Plans (EMP). The significance of an impact is then determined and categorized into one of four categories, as indicated in Table 2, which supports Table 3. Management actions will be assigned for all identified impacts.

A neutral impact implies that it causes the area to return to a pre-project state. This is not regarded as positive, as there would have been no need for this activity if the operation were not carried out.

Table 1: Impact assessment parameter ratings

Rating	Severity		Spatial scale	Duration	Probability
	Environmental	Social, cultural and heritage			
7	Very significant impact on the environment. Irreparable damage to highly	Irreparable damage to highly valued items of great cultural significance or	International The effect will occur across international borders	Permanent: No Mitigation No mitigation measures of natural process will	Certain/Definite. The impact will occur regardless of the implementation of







	valued species, habitat or eco system. Persistent severe damage	complete breakdown of social order.		reduce the impact after implementation	any preventative or corrective actions.
6	Significant impact on highly valued species, habitat or ecosystem	Irreparable damage to highly valued items of cultural significance or breakdown of social order.	National Will affect the entire country	Permanent: Mitigation measures of natural process will reduce the impact	Almost certain/Highly probable It is most likely that the impact will occur
5	Very serious, long term environmental impairment of ecosystem function that may take several years to rehabilitate	Very serious widespread social impacts. Irreparable damage to highly valued items.	Province/ Region Will affect the entire province or region	Project Life The impact will cease after the operational life span of the project	Likely The impact may occur
4	Serious medium term environmental effects. Environmental damage can be reversed in less than a year On	On-going serious social issues. Significant damage to structures / items of cultural significance	Municipal Area Will affect the whole municipal area	Long term 6-15 years	Probable Has occurred here or elsewhere and could therefore occur
3	Moderate, short-term effects but not affecting ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month	On-going social issues. Damage to items of cultural significance. Local	Local Local extending only as far as the development site area	Medium term 1-5 years	Unlikely Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur

2	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants	Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Limited Limited to the site and its immediate surroundings	Short term Less than 1 year	Rare/ improbable Conceivable, but only in extreme circumstances and/ or has not happened during lifetime of the project but has happened elsewhere. The possibility of the impact materializing is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Limited damage to minimal area of low significance, (e.g. ad hoc spills within plant area). Will have no impact on the environment.	Low-level repairable damage to commonplace structures	Very limited Limited to specific isolated parts of the site.	Immediate Less than 1 month	Highly unlikely/None Expected never to happen

Table 2: Probability Consequence Matrix

Significance		Consequence (severity + scale + duration)								
		1	3	5	7	9	11	15	18	21
Probability / Likelihood	1	1	3	5	7	9	11	15	18	21
	2	2	6	10	14	18	22	30	36	42
	3	3	9	15	21	27	33	45	54	63
	4	4	12	20	28	36	44	60	72	84
	5	5	15	25	35	45	55	75	90	105
	6	6	18	30	42	54	66	90	108	126
	7	7	21	35	49	63	77	105	126	147

Table 3: Impact significance threshold limits

Significance		
High	108- 147	
Medium-High	73 - 107	
Medium-Low	36 - 72	
Low	0 - 35	

5 Description of the Receiving Environment

The proposed project area in situated on the Farm Hooggenoeg 293 KS situated under the Lepelle-Nkumpi Local Municipality, Limpopo Province. The proposed project area is located approximately 15.69 km North East of Bogalatladi and approximately 5.57 km North West of Tubex .

5.1 Climate

Polokwane lies on 1303m above sea level and the climate here is considered to be a local steppe climate. There is not much rainfall in Polokwane all year long. The climate here is classified as BSk by the Köppen-Geiger system. The temperature here averages 17.3 °C. The annual rainfall is 598 mm. The driest month is July, with 5 mm of rain. In January, the precipitation

reaches its peak, with an average of 110 mm. January is the warmest month of the year. The temperature in January averages 21.3 °C. At 11.5 °C on average, June is the coldest month of the year. There is a difference of 105 mm of precipitation between the driest and wettest months. The variation in annual temperature is around 9.8 °C.

5.2 Soil

A map in Figure 5 was produced from a desktop study. From the map, it can be deduced that the mining area is covered with the Association of classes 13 & 16: undifferentiated shallow soils and land classes as well as a huge portion categorised by non-soil land classes.

The types of soils in class 13 have orthic topsoil but are typically younger by virtue of recent deposition, erosion or human disturbances, subsurface enrichment is therefore weak.

Soil Classes	Land Capability
Class 1	Has few limitations that restrict its use; it may be used safely and profitably. Suitable land with negligible limitations and is highly productive requiring only simple management practices. When it used for crops it need ordinary management practice to maintain productivity. They are easily worked and are also fairly well supplied with plant nutrients or are highly responsive to inputs of fertilizer.
Class 2	Has some limitations that reduce the choice of plants or require moderate conservation practice. Suitable land with minor limitations which either reduce production or require more than simple management practices to sustain the use. Slight to moderate salinity or sodicity, easily corrected, but likely to persist is taken to imply that strong subsoil acidity, costly to correct and likely to reappear, would disqualify land from Class II.
Class 3	Has severe limitations that reduce the choice of plants or require special conservation practices. Suitable land with moderate limitations which is moderately suited to a proposed use, but which requires significant inputs to ensure sustainable use.
Class 4	Has very severe limitations that restrict the choice of plants, require very careful management. Marginal land with severe limitations which make it doubtful whether the inputs required to achieve and maintain production outweigh the benefits in the long term.

Class 5	Land in this class has little or no erosion hazard but have other limitations impractical to remove that limit its use largely to pasture, range, woodland or wildlife food and cover. These limitations restrict the kind of plants that can be grown and prevent normal tillage of cultivated crops. Pastures can be improved and benefits from proper management can be expected.
Freely drained, structureless soil.	This type of soil is characterised by sand, red soil which is less productivity due to dominating of sand soils have severe limitations that reduce the choice of plants or that require special conservation practices, soils and miscellaneous areas have limitations that preclude commercial plant production and restrict their use to recreational purposes, wildlife habitat, or aesthetic purposes.

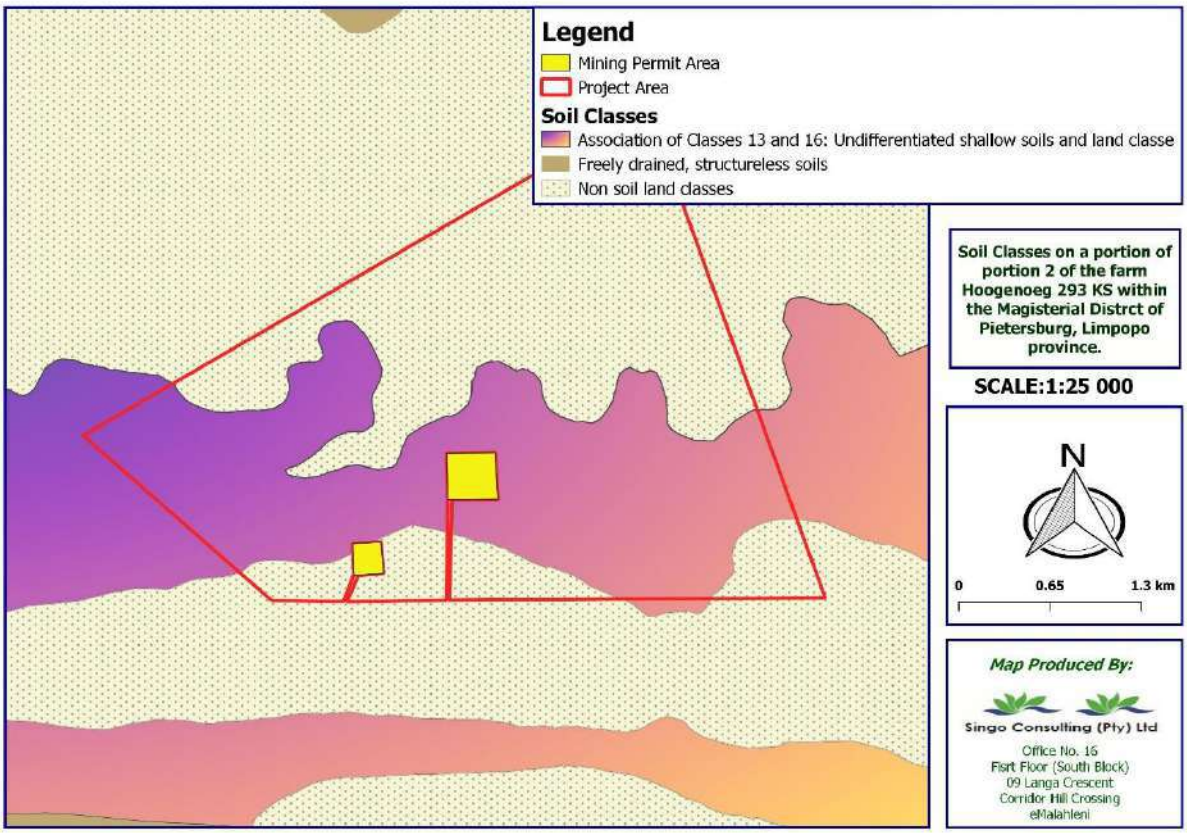

Figure 5: Soil classes map

5.3 Land use

The map in Figure 6 illustrates that the proposed area is primarily kept as natural land.

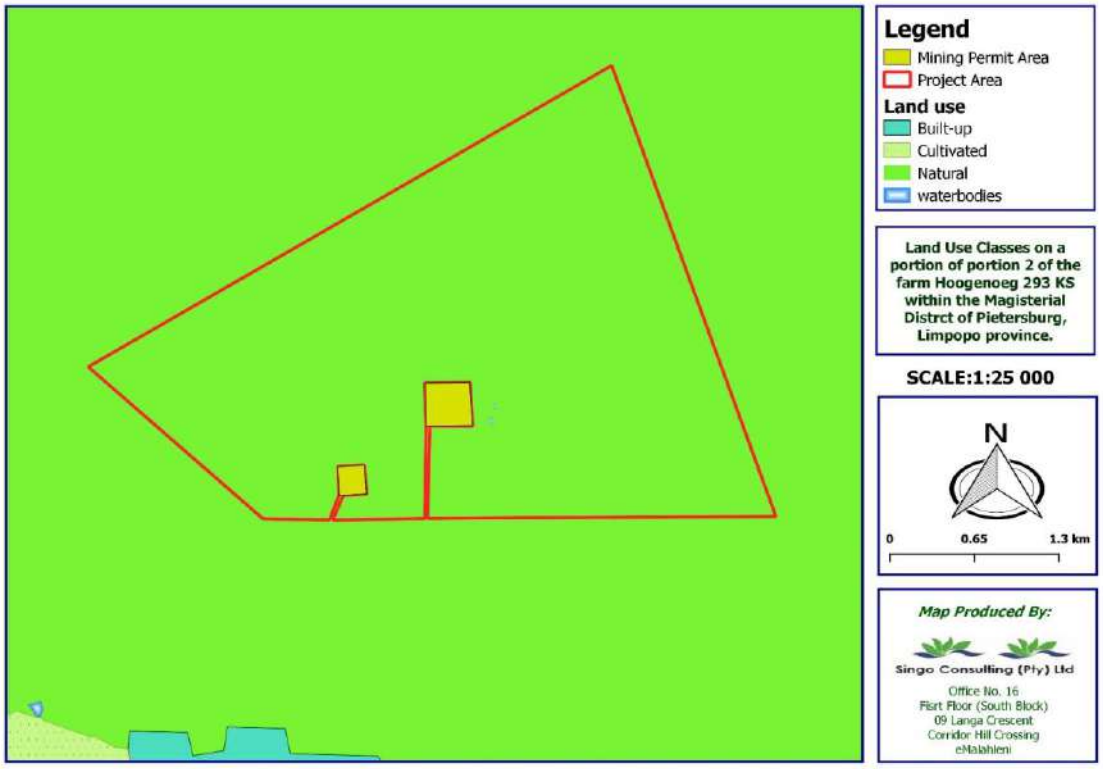

Figure 6: Land use map

6 Potential Environmental Impacts

6.1 Prospecting Phase

During the Chrome ore, Copper ore, Iron ore, Andalisite and Sillimanite prospecting phase, the work carried out will mainly be mapping, logging, sampling, and diamond core drilling to investigate the existence of the expected mineralization, the thickness of the orebodies and its distribution. Core logs will be taken off-site to be sampled and analyzed. During these activities only a little space will be disturbed, as prospecting is a short-term operation.

The topography and natural drainage lines may also be disturbed. The overall impact will be loss of topsoil as a result of erosion as well as potential contamination of the soil, fuel, and oils (hydrocarbons) as a result of the drill rigs that will be used during core drilling.

Prospecting activities will however not change/ alter the land use from degraded, built-up and forest and woodlands to wilderness. The pathways that will be developed during prospecting

will be temporary and not paved, they should be rehabilitated and closed after prospecting. No toxic chemicals are anticipated to flow within the soils as the operation will not involve any mining activity or blasting.

7 Impact Assessment

The environmental impact assessment is designed to identify impacts related to prospecting of activities and how to mitigate these impacts. It is anticipated that with the correct mitigation measures being put in place these impacts can be reduced. The rating of impacts is based on the type of activity that will be undertaken. Similar activities that will have the same impact to soil, land use and land capability have been grouped together and discussed for particular impacts, such as loss of topsoil as a resource.

When the impact rating is significantly different as a result of the activity, a separate rating has been given for those particular activities. The activities, such as Chrome ore, Copper ore, Iron ore, Andalisite and Sillimanite prospecting would potentially have a lower impact on soil, land capability and land use as these areas are less disturbed. For the purpose of this impact assessment activities that are located within relatively undisturbed areas have been rated together and all other activities falling within the prospecting area have been rated together with respect to the level of the impacts.

7.1 Prospecting Phase

Topsoil will not be removed as there will not be any mining related activities taking place. No foundation excavations will be needed for fuel storage depot as fuel will be transported to site daily during the drilling phase.

7.1.1 Impact: loss of topsoil as a resource, erosion, and compaction

Table 4: Impact: loss of topsoil as a resource, erosion, and compaction

Criteria	Details / Discussion
Description of impact	During diamond core drilling the land clearance and earthworks will have a minor impact. Even though soil will be cleared from most of the areas where infrastructure will be placed, areas that are not disturbed by the drilling will remain in their current land use.

	The boreholes footprint will be minimal. The pathways to be created to provide access of the drill rig can cause compaction of soil. During clearance of vegetation there is a greater risk, when compared to other areas, that topsoil would be exposed and there is potential risks for increased erosion in these areas during rainfall events, resulting in a potential loss of soil as a resource. In addition, wind erosion would be greater as these areas are exposed as a result of the removal of vegetation.
Mitigation required	❖ Pathways are to be stripped when the soil is dry (as far as practical possible), as to reduce compaction; and ❖ To be stripped according to the stripping guideline and management plan, and further recommendations contained within the rehabilitation plan. ❖ Minimise the period of exposure of soil disturbances through a planning schedule

8 Soil Management Plan

8.1 Background

More important than chemical imbalances which can be easily restored at cost, is soil compaction and volumes of replacement during soil reclamation. Heavy drill rigs equipment to be used during prospecting may lead to areas of low soil and land capabilities. Such areas have limited land use options and specialized management needs. However, this impact will be minimal.

8.2 Physical mitigation

Good quantity and quality topsoil are an essential ingredient in the process of soil reclamation. Factors leading to decay in soil quality are:

- ❖ Contamination impacts on soil quality
- ❖ Erosion impacts on soil volume
- ❖ Indiscriminate storage impacts on soil quality and

- Indiscriminate use impacts on soil volume.

Therefore, care must be taken during the prospecting process to prevent compaction on the one hand and to replace soil volumes back to a representative pre-process plant soil and land capability while emulating the pre prospecting landscape.

8.3 Soil quality indicators

Deciding on and monitoring soil quality indicators during soil impacts and reclamation can greatly improve the chances of reclaiming soil to a sustainable resource. The following actions should form part of monitoring soil quality and rehabilitation sustainability:

- Visual soil assessment by a specialist
- Soil quality monitoring system
- Visual assessment should include specialist recording of water ponding, plant intensity, earthworms, runoff, ease of cultivation, soil colour, soil aroma, soil structure and opacity of the soil.
- Soil quality monitoring should include, bulk density, infiltration rate, water holding capacity, electrical conductivity, pH, soil nitrate and microbial activity.

Organic matter must be added back into the soil; hence soil is pre-mixed with organic material and placed back to the disturbed area. Continuous visual and soil quality monitoring as mentioned under soil quality indicators above should ensure that the best possible soil reclamation procedure is followed. Vehicle movements must be restricted on freshly dumped soil to prevent compaction as much as possible.

9 Conclusion and Recommendations

A soil, land use and agricultural potential investigation was conducted for the proposed Chrome ore, Copper ore, Iron ore, Andalisite and Sillimanite prospecting project. The topographical, land use and soil type data available for the site were compiled using both desktop and field assessment data to determine the potential impacts of the prospecting activities.

The following conclusions are made in this study:

- The soils within the area is characterized by sand, red soil which is less productivity due to dominating of sand soils have severe limitations that reduce the choice of plants

- The land use on the investigation site is covered by natural land.
- The Chrome ore, Copper ore, Iron ore, Andalisite and Sillimanite prospecting infrastructure will have less impact on soils and footprint will be minimal.
- It is anticipated that the Chrome ore, Copper ore, Iron ore, Andalisite and Sillimanite prospecting activities will not lead to severe loss of soils and degradation of agricultural potential.
- It is highly recommended to do rehabilitation after the period of Chrome ore, Copper ore, Iron ore, Andalisite and Sillimanite prospecting activities cease.
- And all the wetlands and non-perennial rivers will be buffered as "no go" area preferably a 100 m buffer will apply
- No washing of any mechanical equipments or vehicles should be allowed 100 m from the water resources.
- The core logs of boreholes with Chrome ore, Copper ore, Iron ore, Andalisite and Sillimanite material should be cleared from the ground immediately after logging by the geologists to prevent washing and leaching to the water resources during precipitation events.

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BASIC HYDROGEOLOGICAL STUDY FOR PROSPECTING RIGHT APPLICATION

DC ORE MINERALS AND ENERGY

Proposed Prospecting Right Application for Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite with an extent of approximately 1054, 875244 ha on the Farm Hooggenoeg 293 KS situated under the Lepelle-Nkumpi Local Municipality, Limpopo Province.

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2021

Project Information

Report Type Geohydrological Report

Project Title:	Proposed Prospecting Right Application for Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite with an extent of approximately 1054, 875244 ha on the Farm Hooggenoeg 293 KS situated under the Lepelle-Nkumpi Local Municipality, Limpopo Province.
Mineral (s)	Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite
Site Location	Lepelle-Nkumpi Local Municipality, Limpopo Province.
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Disclaimer:

The results and conclusions of this report are limited to the Scope of Work agreed between Singo Consulting (Pty) Ltd and DC Ore Minerals and Energy for whom this investigation has been conducted. All notions made and all knowledge contained within this report and its attachments hinge on the convenience to and dependability of relevant information, including maps, previous reports and word-of-mouth, from the Client and affected parties. All work conducted by Singo Consulting (Pty) Ltd is done in accordance with the Singo Consulting (Pty) Ltd Standard Operating Procedures.

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Declaration:

We hereby declare:

1) We have no conferred interest in the project that is the subject of this report as well as its attachments. we have no special interest with respect to the parties involved in this project.
2) We have no bias regarding this project or with respect to the various stakeholders involved in this project.
3) We have not obtained, nor have we been presented, any significant form of unsuitable reward for compiling this report.

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Executive Summary

Singo Consulting (Pty) Ltd was appointed by DC Ore Minerals and Energy to conduct a basic hydrogeological study for the Prospecting Right Application which has been submitted for the prospecting of Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite with an extent of approximately 1054, 875244 ha on the Farm Hooggenoeg 293 KS situated under the Lepelle-Nkumpi Local Municipality, Limpopo Province.

Outcomes of the Investigation

- The Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite prospecting activity is short term. AMD is expected to occur due to the drilling activity that will create cracks and fractures thereby disturbing the lithology which may leach into underground water.
- Drilling activity will not be conducted near water resources.
- And all the wetlands and non-perennial rivers will be buffered as no go area.
- Extreme caution should be taken during prospecting, owing to the non-perennial river passing through and numerous wetlands existing in the project area. No washing of any mechanical equipment's or vehicles will be allowed near the water resources.
- Water samples must be taken from all the exploration boreholes by using approved sampling techniques and adhering to recognized sampling procedures. Samples should be analyzed for both organic as well as inorganic pollutants, as mining activity often lead to hydrocarbon spills in the form of diesel and oil.
- The core logs of exploration boreholes should be cleared from the ground immediately after logging by the geologists to prevent washing and leaching to the water resources during rainfall.
- After prospecting, rehabilitation of the disturbed area should take place.
- The numerical model should be recalibrated as soon as more hydrogeological data are made available. This would enhance model predictions and certainty.

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1 Introduction

Singo Consulting (Pty) Ltd was appointed by DC Ore Minerals and Energy to conduct a basic hydrogeological study for the Prospecting Right Application which has been submitted for the prospecting of Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite with an extent of approximately 1054, 875244 ha on the Farm Hooggenoeg 293 KS situated under the Lepelle-Nkumpi Local Municipality, Limpopo Province.

This report is not planned to be an intensive description of the proposed project; however, it is conducted as a specialist provisional geohydrological study to evaluate the geohydrological impact the prospecting activity has on the environment.

1.1 This geohydrological study aims and objectives

- Description of the geohydrological environment where Chrome & applied resources' prospecting will take place.
- Forecasting of the environmental impacts of the proposed prospecting activity on the geohydrological regime of the area. Including the description of potential negative impacts during drilling, sampling, logging and of post-prospecting period.
- Predicting the effect of the prospecting on the receiving environment.
- Gathering all the relevant information and recommendations in a geohydrological report, prepared in such a way that it can be included into the Environmental Management Program document.

1.2 Project location

A locality map created by QGIS software illustrates detailed and comprehensive information regarding the surrounding settlements and infrastructure of the proposed project area. The proposed project area is approximately 15.69 km North East of Bogalatladi and approximately 5.57 km North West of Tubex. The map below shows the locality of the study area.

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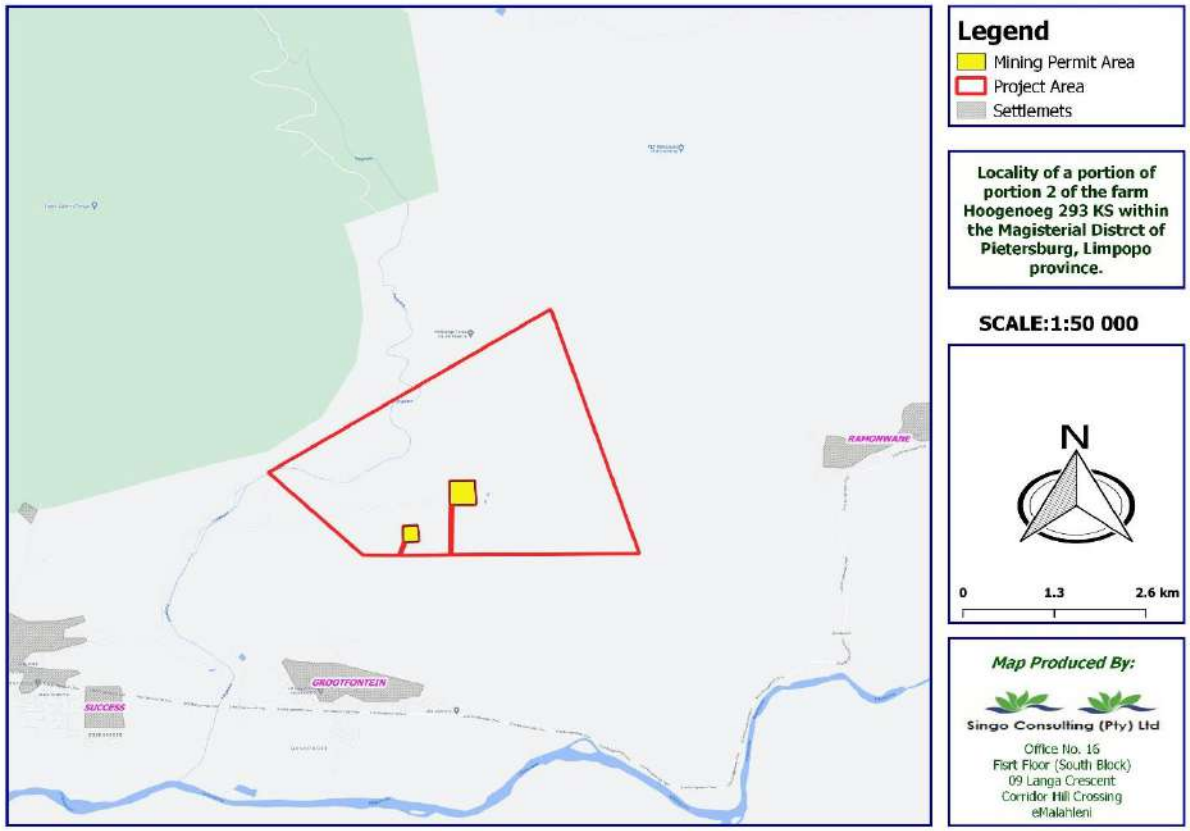


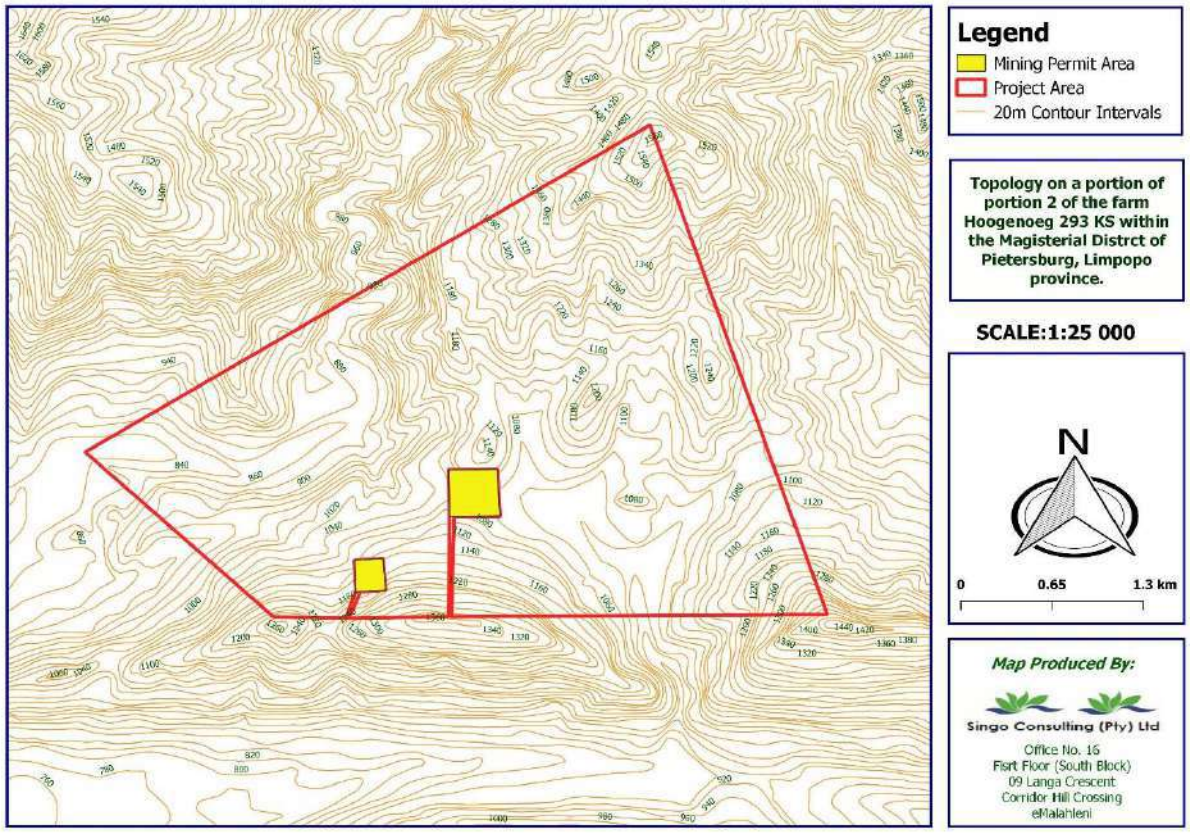
Map 1: Locality map of the proposed project

2 Geohydrological setting

2.1 Topography and drainage

Topography is the study of the shape and features of land surfaces. The topography of an area could refer to the surface shapes and features themselves, or a description (especially their depiction in maps). Topography is a field of geoscience and planetary science and is concerned with local detail in general, including not only relief but also natural and artificial features, and even local history and culture. This meaning is less common in the United States, where topographic maps with elevation contours have made "topography" synonymous with relief.

The slope within and around the project area is not uniform and this is evident by the contour lines which are neither evenly nor parallel spaced. The proposed prospecting area is situated within a region characterized hills topography of the farm Hooggenoeg 293 KS. This can be observed on the topology map attached below as the altitude is generally on average of 840-1550 metres above sea level. See Map 2 below.



Map 2: Topography of the prospecting right area

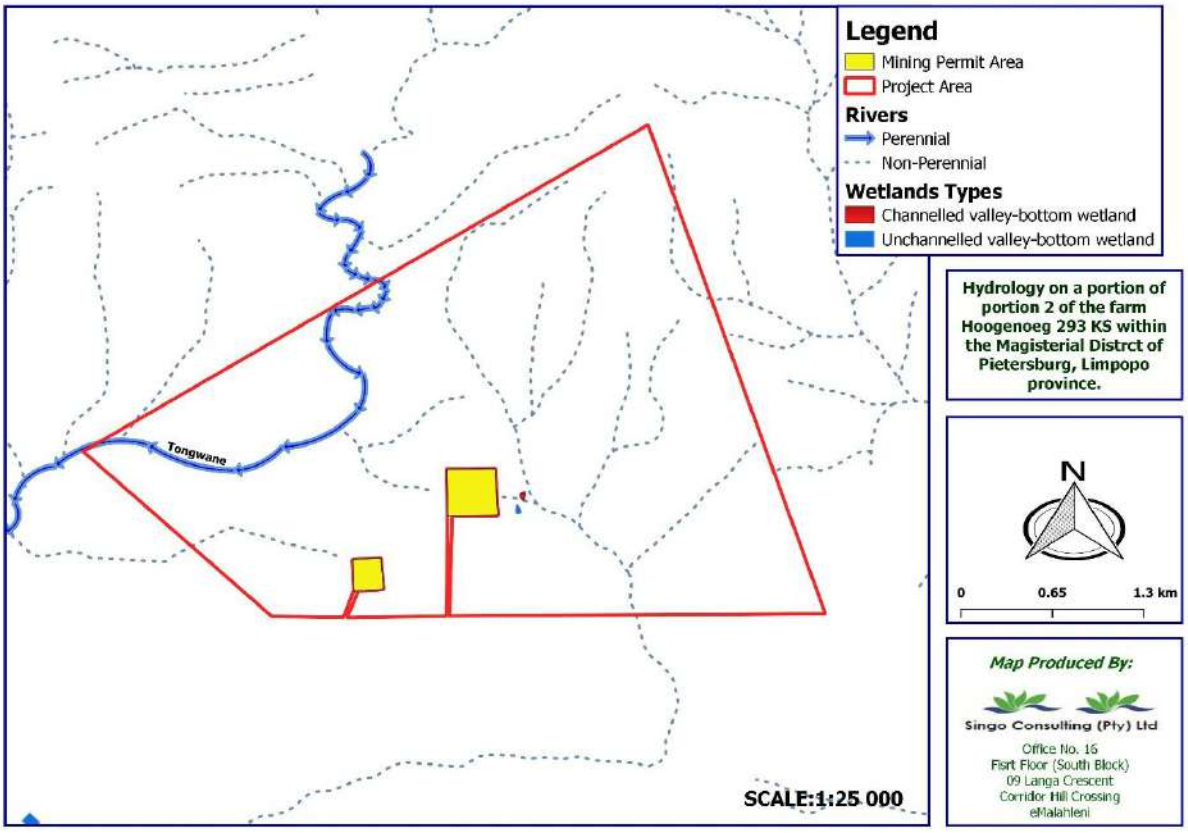
The hydrology surrounding the proposed area is of vital importance as well. In this context hydrology is all the surface waters appearing within and nearby the proposed project area, where a potential to be impacted upon by the project exist. The hydrology map, illustrates that the following water bodies exists within and nearby the project area:

- Perennial river
- Unchanneled valley-bottom wetland
- Non-perennial rivers
- Channeled valley bottom wetland

These are important natural water resources that should not be disturbed by anthropogenic activities. For this project where prospecting right poses a risk on them, there should be measures and guidelines put in place that will protect the water resources in this area to ensure optimal conservation of water. The prospecting right should take place during dry seasons where the water percentages are exceptionally low. Drilling activity should not be conducted

near these water resources, the exploration geologists will be advised to drill and sample away from rivers and wetlands on site.

Extreme caution should be taken during prospecting, owing to the dam, non-perennial rivers and numerous wetlands existing within and nearby the project area. No washing of any mechanical equipment's or vehicles will be allowed near the water resources, and all the perennial and non-perennial rivers will be buffered as no go area.



Map 3: Hydrology of the prospecting right area

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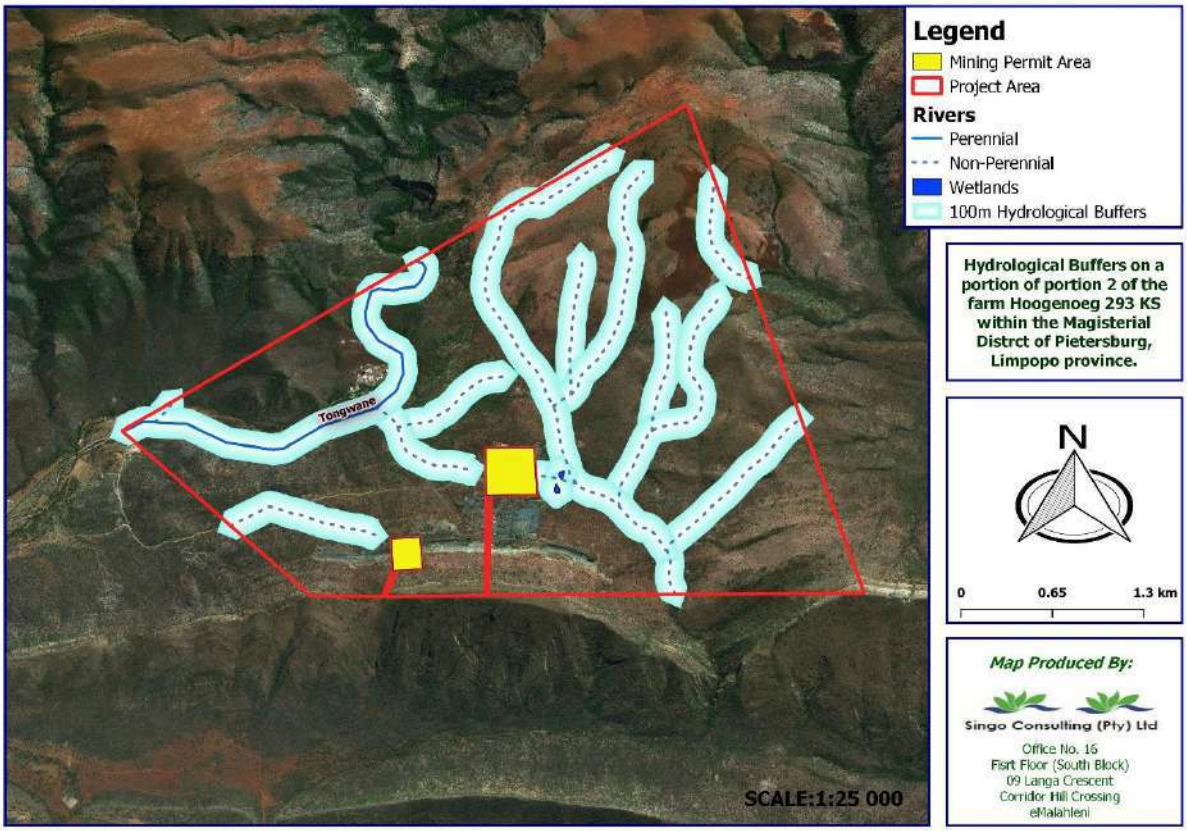
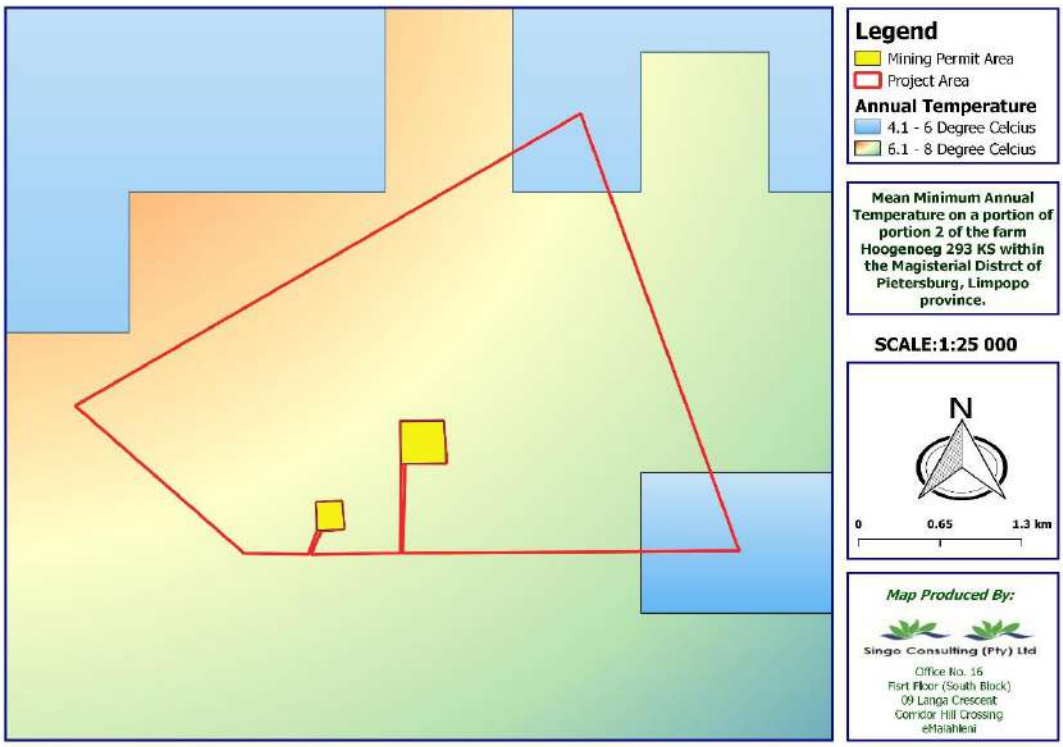


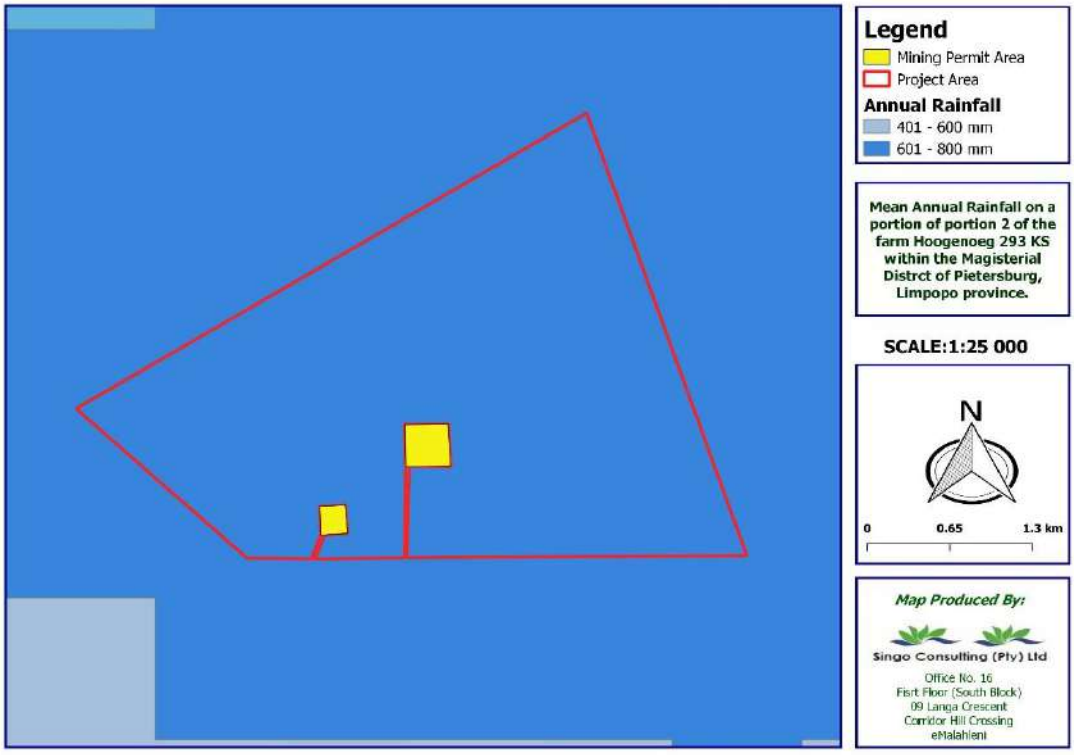
Map 4: Buffer map

2.2 Climate

Polokwane lies on 1303m above sea level and the climate here is considered to be a local steppe climate. There is not much rainfall in Polokwane all year long. The climate here is classified as BSk by the Köppen-Geiger system. The temperature here averages 17.3 °C. The annual rainfall is 800 mm. The driest month is July, with 5 mm of rain. In January, the precipitation reaches its peak, with an average of 110 mm. January is the warmest month of the year. The temperature in January averages 21.3 °C. At 11.5 °C on average, June is the coldest month of the year. There is a difference of 105 mm of precipitation between the driest and wettest months. The variation in annual temperature is around 9.8 °C.



Map 5: Mean minimum annual temperature



Map 6: Mean annual rainfall

3 Scope of work

The following work procedure has been pursued in order to stick to the scope of work:

- Gathering of desktop information in the form of maps, textbooks, scientific journals, and article.
- Basic analysis of surface water protection
- Existing Hydrocensus information for the groundwater potential (quality & quantity) of the area will be evaluated. The data gathered during this phase will assist in the development of a groundwater-monitoring program. If suitable boreholes exist in the study area, they will be included into the monitoring program.
- In order to quantify potential impacts of the various project phases on the ambient groundwater environment, a numerical groundwater flow model for the project area will be developed. The impacts associated with prospecting activities are anticipated to be temporary as this activity of prospecting takes place within a short period of time.
- Accessible data was interpreted and assembled for the prediction of the possible environmental impact and to abstract mitigation measures.
- Management and mitigation measures for identified impacts should be outlined for each phase of the prospecting right project and associated monitoring, management and mitigation measures recommended.

4 Methodology

4.1 Desktop study

Section 16 of the Mineral and Petroleum Resources Development Act (MPRDA) (No. 28 of 2002) requires, upon request by the Minister, that an Environmental Management Programme should be submitted and that the applicant notifies and consults with Interested and Affected Parties (I&APs). Section 24 of the National Environmental Management Act (NEMA) requires that activities which may impact the environment be authorized by the relevant authority before commencing with that activity. Such activities are listed under Regulations Listing Notice 1 Government Notice (GN) 983 of the NEMA.

As part of the prospecting phase, physical prospecting is planned to be conducted on site and will involve the use of diamond core drilling to investigate the existence of the expected mineralization, the thickness of the orebodies and its distribution. Core logs will be taken off-site to be sampled and analyzed

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4.2 Drilling and sitting of boreholes

As part of the prospecting phase, physical prospecting is planned to be conducted on site and will involve the use of diamond core drilling to investigate the existence of the expected mineralization, the thickness of the orebodies and its distribution. Core logs will be taken off-site to be sampled and analysed. An estimated 15 boreholes will be drilled one at a time at various locations within the proposed project area. The depths of the drill holes will average 150 m and will be determined onsite whilst the drilling programme is underway as influenced by the depths and dips measured in other holes. A buffer zone of 500m will be kept from identified waterbodies or wetlands. A buffer of 100 meters will be kept from public roads.

4.3 Aquifer testing

Pumping tests are important tools that provide information on the hydraulic behavior of a borehole, the reservoir, and the reservoir boundaries. All this information is essential for efficient aquifer and well field management. In general, the objectives of a pumping test are:

- To obtain an understanding of the aquifer,
- To quantify the aquifer's hydraulic and physical properties and
- To determine the sustainable yield and efficiency of a borehole.

The interpretation of pumping test data is based on mathematical models that relate drawdown response to discharge in the abstraction borehole. The results obtained from these short duration tests can then be used to project the borehole's performance over a long period of time. In fractured-rock aquifers, the geometry and permeability of the system have a large influence on the drawdown. The scale of heterogeneity in a fractured rock system may be large in relation to the scale of the test. Therefore, convention models developed for homogeneous porous aquifers might not be viable in fractured rock systems.

4.4 Groundwater modelling

During model setup, the conceptual model is translated into a numerical model. This stage entails selecting the model domain, defining the model boundary conditions, discretizing the data spatially and over time, defining the initial conditions, selecting the aquifer type, and preparing the model input data. The above conditions together with the input data are used to simulate the groundwater flow in the model domain for pre steady state conditions.

Conceptual model

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A conceptual model is a simplification of the complex real system down to familiar aspects that can easily be solved. This conceptual model is just a step prior to a solution model which can either be analytical or numerical.

Numerical model

Numerical groundwater modelling consists of flow and transport modelling types. Groundwater flow modelling can be represented by finite difference method or finite element. In this project finite difference method is used. The chosen software is MODFLOW

4.5 Groundwater availability assessment

The fractured aquifer system (~ 15 to 40m) present in the fresh rock below the weathered zone are well cemented, and do not allow significant water flow. All groundwater movement therefore occurs along secondary structures such as fractures, cracks, and joints in the rock. These structures are best developed in sandstone and quartzite; hence the better water yielding properties of the latter rock type.

Dolerite sills and dykes are generally impermeable to water movement, except in the weathered state. In terms of water quality, the fractured aquifer always contains higher salt loads than the upper weathered aquifer. The higher salt concentrations are attributed to a longer contact time between the water and rock (IGS, 2008).

5 Baseline information

5.1 Geology

5.1.1 Regional Geology

Transvaal Supergroup

The Transvaal Supergroup is preserved within three basins on the Kaapvaal craton, Kanye in Botswana, and the Transvaal and Griqualand West basins in SA. For much of the lower part of the Transvaal, deposition of these sediments took place within one large epeiric basin, and the three basins preserved now represent only remnants of that very large depository. For the upper parts of the Transvaal Supergroup, deposits in the three basins tend to be different and at least partly unique to each preserved basin. Age of the Transvaal Suprgroup is from c. 2660 Ma for the basal "protobasinal rocks", found only at the base of the Transvaal sub-basin succession, to c. 2.6-2.4 Ga for the chemical sediments of the Chuniesport-GhaapTaupone

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Groups (single chemical basin across much of the craton), to the Pretoria Group which is not accurately dated, but which is c. 2.3-2.1 Ga.

The uppermost units, the Rooiberg Group and overlying lavas and sediments of the Loskop, Rust de Winter and Glentig Formations, although stratigraphically part of the Transvaal Supergroup, really represent genetically, the onset of the Bushveld Complex, which intruded into the Transvaal (sub-) basin. The succession in the latter basin is the thickest and reaches up to about 12 km, with only about 4-5 km being preserved in the Griqualand West sub-basin.

Transvaal sedimentation began at least 2.6 Ga ago in the Transvaal sub-basin, and early protobasinal rocks (a purely descriptive term) may have been coeval with late stage Ventersdorp Supergroup events. Alternatively, and more likely, they reflect local rifted basins within the Kaapvaal craton, formed as a result of stresses on that craton during the Limpopo mobile belt collision, and in which immature alluvial sediments and acid-to mafic lavas were deposited.

Uppermost protobasinal rocks are much more widespread, linking these various protobasinal rifts and reflect deeper water more mature sedimentation – they likely reflect a foreland basin resulting from the uplifted Limpopo orogen. The protobasinal rocks are unconformably overlain by the thin (10-60 m) sheet sandstones of the Black Reef Formation in the Transvaal sub-basin, which were laid down by rivers. At about the same time, in the Griqualand West subbasin, sedimentation began with the mixed clastic and chemical shallow marine shoreline and continental deposits (plus minor lavas) of the Schmidtsdrif Subgroup.

Therafter, at c. 2.58 Ga, all three Transvaal subbasins and much of the Kaapvaal craton were drowned by a rise in global sea levels, probably related to high rates of continental crustal growth globally. Much of the craton was now covered by a shallow sea, with water depths of 100-200 m, and in which limestone deposits, minor shale and some chert were laid down. These sediments were often trapped by very large cyancobacterial colonies which thrived in the clean shallow epeiric sea conditions, and, as they were photosynthetic, produced oxygen which was taken up by the seawater and which later oxidised the iron minerals deposited above the carbonate rocks in the then deeper (c. 200m) epeiric sea (ie Penge Fm. In Transvaal sub-basin, and Asbesheuwels Subgroup in Griqualand-West).

Sea levels rose and fell four times during deposition of the Chuniespoort and Ghaap Groups, and deposition of the uppermost iron formations was most likely related to widespread seafloor volcanism (ie fumaroles) in deeper water areas adjacent to the Kaapvaal craton. Mixed clastic and chemical sediments in the Koegas Subgroup represent the shrinking epeiric sea

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and its final retreat off the Kaapvaal craton, while the Duitschland Formation in the Transvaal sub-basin largely reflects weathering and reworking of Chuniespoort rocks.

Following a major, regional unconformity and significant time gap, sedimentation continued separately in the Transvaal and Griqualand West sub-basins. In the Transvaal sub-basin, the Pretoria Group (largely alternating shales and sandstones, lesser andesitic lavas and minor conglomerates, ironstones) reflects two rifting events, during which alluvial deposits, volcanic rocks and some lakes formed, followed in each case by slower thermal subsidence, when sea level rose and drowned the basin, and in which deeper water shales and coastal sandstones were laid down, by a general clastic, shallow epeiric sea.

A major andesitic flood basalt (Hekpoort Formation) was associated with the onset of the second rifting event, and covered the Kaapvaal craton as far as the Griqualand West sub-basin, where it is known as the Ongeluk Formation. In the Griqualand West sub-basin, this is underlain by the Makganyene Diamictite Formation, probably of glacial origin. Above the Ongeluk are two chemical sedimentary formations (Hotazel and Mooidraai), which contrast to the much thicker and clastic sedimentary succession of the Pretoria Group.

Finally, for the Transvaal sub-basin, impingement of the large Bushveld Complex (2053 Ma) mantle plume at the base of the Kaapvaal craton resulted in partial melting of this craton, and the outflow of the thick (up to 7 km) Rooiberg acidic lavas. They were laid down in faulted smaller basins, associated with irregular occurrences of immature continental sediments.

5.1.2 Local geology

The Hooggenoeg 293 KS farm is located within the Duitschland, Klapperkop quartzite and Timeball Hill formation, however the underlying geology specific to the mining permit is the Klapperkop quartzite and Timeball Hill formation. The thick shales and subordinate sandstones of the Timeball Hill formation are generally ascribed to a fluvio-detltaic basin fill sedimentation system (Erikson, 1973). A basal black shale facies, associated basin- wide in the subsurface with lavas and pyroclastic rocks of the Bushy Bend lava member reflects suspension sedimentation and fumarolic eruptions. Succeeding rhythmically interbedded mudstones/ siltstones and fine-grained sandstones are interpreted as turbidite deposits (Kuenen, 1963; Button, 1973). These grade up into the medial Klapperkop Quartzite member interpreted as fluvio-deltaic sandstones which fed the more distal turbidites, tidal reworking of these sands is also inferred.

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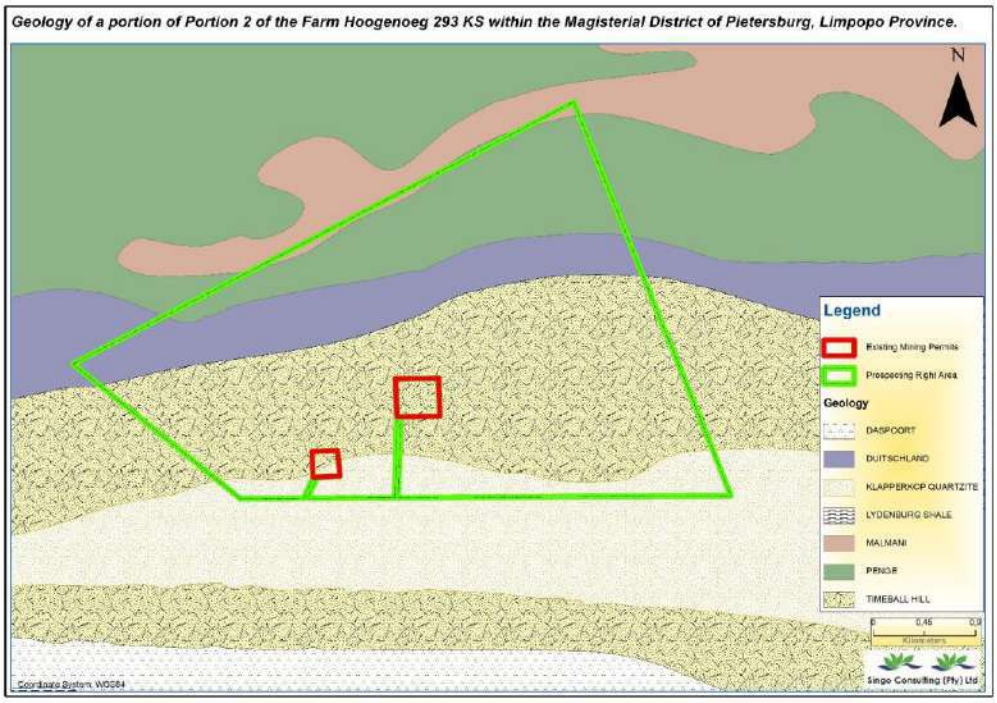

Map 7: Geology of the prospecting right area

5.2 Acid generation capacity

5.2.1 Acid mine drainage

Acid mine drainage (AMD) poses a serious threat in mines especially mines where there is an abundance of iron ore minerals. AMD is expected to occur due to the extraction of iron ores such as chalcopyrite, pyrite or arsenopyrite ores. Hence, acid mine drainage studies should be included as one of the impacts to be mitigated in the mining area. The presence of acid mine drainage in a mining area will be demonstrated by a drop in pH. The equations below show the process of acid mine drainage formation detailed in four steps. This process is self-propagating until the ferric iron or pyrite is depleted. Generally, when pyrite combines with oxygen and water, acid mine drainage forms. If AMD gets into surface waterways, both the acidity and metal content can produce significant environmental problems over large distances. Once AMD reaches surface waters, the acidity may cause significant environmental problems over long distances and destroy the aquatic life.

1. Oxidation of Polysulfide to sulphate by O2

$2FeS2 + 7O2 + 2H2O \rightarrow 2Fe2+ + 4SO42- + H+$

2. Oxidation of Fe2+ (ferrous iron) to Fe3+ (ferric iron) by O2

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$4Fe^{2+} + O_2 + 4H^+ \rightarrow 4Fe^{3+} + 2H_2O$

3. Hydrolysis of iron (ferriciron→ferrichyfroxide, "yellow boy")

$4Fe^{3+} + 12H_2O \rightarrow 4Fe(OH)_3 + 12H^+$

4. Oxidation of polysulfide to sulphate by Fe3+ at low pH

$FeS_2 + 14Fe^{3+} + 8H_2O \rightarrow 15Fe^{2+} + 16H^+$

Total: $FeS_2 + 15/4\ O_2 + 7/2H_2O \rightarrow 2Fe(OH)_3 + 2SO_4^{2-} + 4H^+$

Acid mine drainage can be treated in various ways including:

- An increase in pH or raising alkalinity. This can be achieved by neutralization reactions, introducing alkalinity reagents such as Na CO3 or NaCl,
- Removing metals like iron, zinc and aluminium from water.
- Conducting passive treatments of acid mine drainage (limestone leach beds) as well as conducting active treatment of acid mine drainage (treatment plants)

5.3 Hydrogeology

5.3.1. Regional hydrogeology

Typically, five distinct aquifer types:

- Basement (fractured Achaean-Proterozoic igneous/ metamorphic)
- Hard-rock (e.g. Table Mountain TMG, Waterberg and Natal Groups sandstone; fractured)
- Karst/ dolomite (dissolution)
- Karoo (fractured and influenced by dykes)
- Porous (intergranular Quaternary alluvial, coastal, Aeolian and other surficial unconsolidated deposits)

The study area falls under the **hardrock formation**. For effective borehole yields, the boreholes must target the fracture zones in this area.

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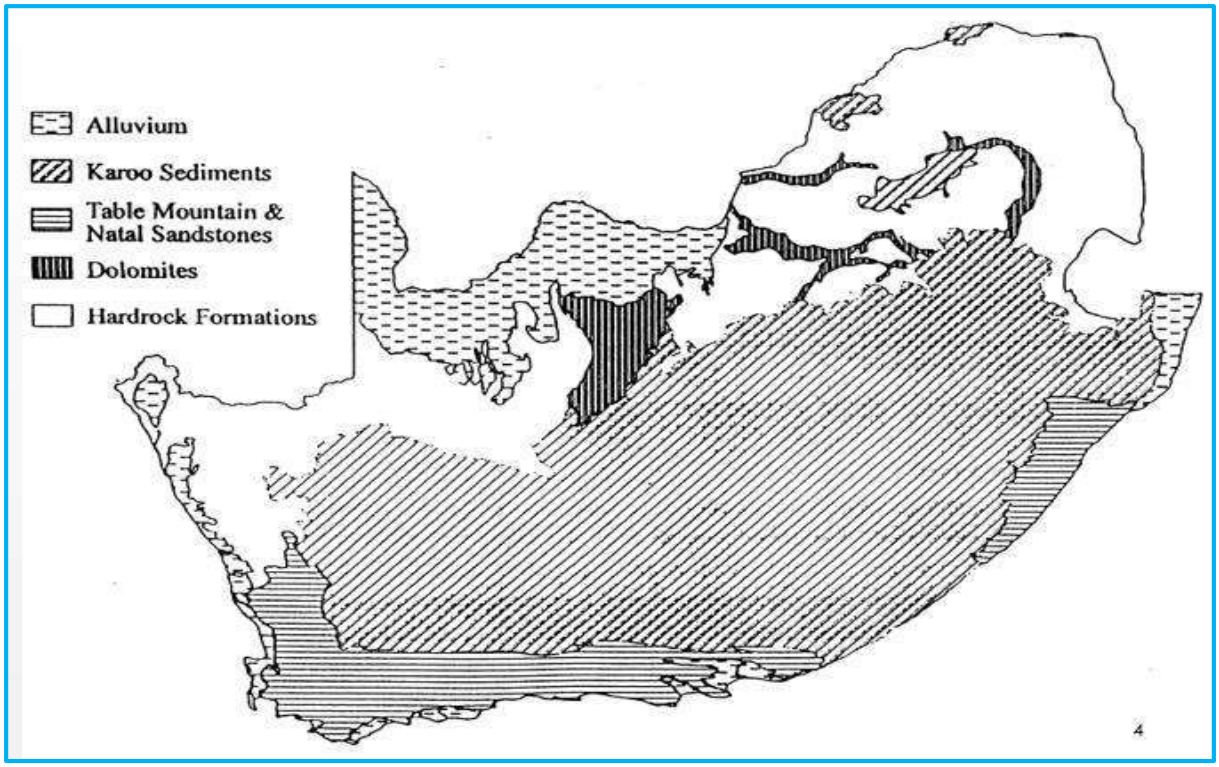

Figure 1: Aquifers of South Africa

The groundwater potential of the formations located in the project area is limited in their pristine state due to low permeability, storage, and transmissivity. Secondary processes, such as weathering, fracturing, etc., are required to enhance the groundwater potential.

Regional Groundwater Occurrence and Aquifers

Based on the geology within the study area, the structural geology, and the geomorphology, the following conditions can arise to enhance aquifer development within the study area:

- The fractured transition zone between weathered and fresh bedrock
- Fractures along contact zones between the host rocks due to heating and cooling of rocks involved with the intrusions
- Contact zones between sedimentary rocks of different types
- Interbed or bedding plane fracturing
- Openings on discontinuities formed by fracturing
- Faulting due to tectonic force
- Stratigraphic unconformities
- Zones of deeper weathering
- Fractures related to tensional and decompression stresses due to off-loading of overlying material

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- Groundwater occurs within the joints, bedding planes and along dolerite contacts. Groundwater potential is generally low in these rocks, with 87% of borehole yields < 3 l/s.

The fractured aquifer consists of the various lithologies of siltstone, shale, sandstone and quartzite. The pores of the geological units are generally well cemented, and the principle flow mechanism is fractured flow along secondary structures e.g. faults, bedding plane fractures etc. The intrusion of the fractured aquifer by dolerite dykes and sills has led to the formation of preferential flow paths along the contacts of these lithologies due to the formation of cooling joints. The dykes may act as permeable or semi-permeable features to impede flow across the dykes.

The fractured aquifer is separated from the overlying fractured Karoo aquifer by Dwyka tillites which act as an aquiclude where present. The flow mechanism is fracture flow as can be expected from the crystalline nature of the granite rocks. The water quality is generally characterised by high fluoride levels which limits exploitation of this aquifer in combination with the general low yields, deep (expensive) drilling and the low recharge (Grobbelaar et al, 2004). Mining of the chrome, copper, andalusite and iron has resulted in the introduction of an artificial aquifer system which generally dominates the groundwater flow on a local and regional scale. Below is a summary of the local geohydrological system.

5.3.2. Local Hydrogeology

Two distinct aquifer types exist which are shallow weathered aquifer (unconfined) and Upper fractured aquifer (unconfined to semi-confined) (less than 70 to 90mbgl).

1. **Shallow weathered aquifer (unconfined)**

Overburden/Weathered Zone Aquifer

- The weathered zone of the Transvaal sediments hosts the unconfined or semi-confined shallow weathered Transvaal aquifer. Water levels are often shallow (few meters below ground level) and the water quality good due to direct rainfall recharge and dynamic groundwater flow through the unconfined aquifer in weathered sediments, which makes it also vulnerable to pollution.
- Water intersections in the weathered aquifer are mostly encountered above or at the interface to fresh, where the vertical infiltration of water is typically limited by impermeable layers of weathering products and capillary forces, with subsequent lateral movement following topographical gradients.

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- Localised perched aquifers may occur on clay layers or lenses at shallower depth (soil zone) but are due to their localised and detached nature of no further interest in the context of the current study.
- Alluvial deposits occur in most valley bottoms associated with surface water courses, but their regional coverage is small. These unconsolidated alluvial sediments comprise of clay, sand, gravel and boulder sized grains.

2. Fractured aquifer

Upper fractured aquifer (unconfined to semi-confined) (less than 70 to 90mbgl)

- The weathered aquifer is underlain by a deeper semi-confined to confined fractured aquifer in which fracture flow dominates. The fractured Transvaal aquifer consists of the various lithologies of siltstone, shale, sandstone and quartzite, where groundwater flow is governed by secondary porosities like faults, fractures, joints, bedding planes or other geological contacts, while the rock matrix itself is considered impermeable.
- Geological structures are generally better developed in competent rocks like sandstone, which subsequently show better water yields than the less competent silt- or mudstones. Not all secondary structures are water bearing due to e.g. compressional forces from the neo-tectonic stress field overburden closing the apertures.

5.4. Groundwater levels

- The depth to groundwater level i.e. the top of the saturated zone generally lies between 5 and 40 metres below the surface.
- The probability of striking water is highest within the first 10-15 metres or so below the groundwater level.
- Peak strike depths range from 15 to 50 metres below the surface. Below 50 m strike frequency averages about one third of that between 10 and 40 m.
- The chances of striking water are neither enhanced nor on the other hand appreciably reduced by the presence of dykes.
- Dykes should not be regarded as hydrogeologically different from the gneisses, granites and granitoids in which they occur but as part and parcel of a hard-rock entirety. Their water-bearing characteristics should be seen neither as barrier nor as conduit but as variable as the adjoining country rock.
- Dyke contacts are not per se water strike zones. Success depends on whether country rock or dyke or both are weathered and fractured to below the water level.

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- Deeper strikes do not necessarily result in higher yields. There is no material difference between shallow-strike and deep-strike median yields. The effect of greater pumping drawdown is apparently counteracted by a decrease of fracture aperture.

5.5. Potential contaminants

The potential contaminants for the prospecting of Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite are minimal and can be controlled easily as this activity will only take place for a short period of time. Fuel and oil handling facilities are likely sources of hydrocarbon related contaminants. Oils, grease, and other hydrocarbon products (such as petrol and diesel) handled in these areas may contaminate the environment by spillages and leakages (e.g. from drill rigs).

5.6 Aquifer classification

The figure below illustrates aquifer classification of different areas in South Africa. It can be deduced that the project area comprises of minor aquifers and the dominant water source is a combination of surface water and groundwater. Table 1 interprets the meaning of the aquifer classification and when an area is said to have a minor aquifer it means that the aquifer is Moderately yielding aquifer of acceptable quality or high yielding aquifer of poor-quality water.

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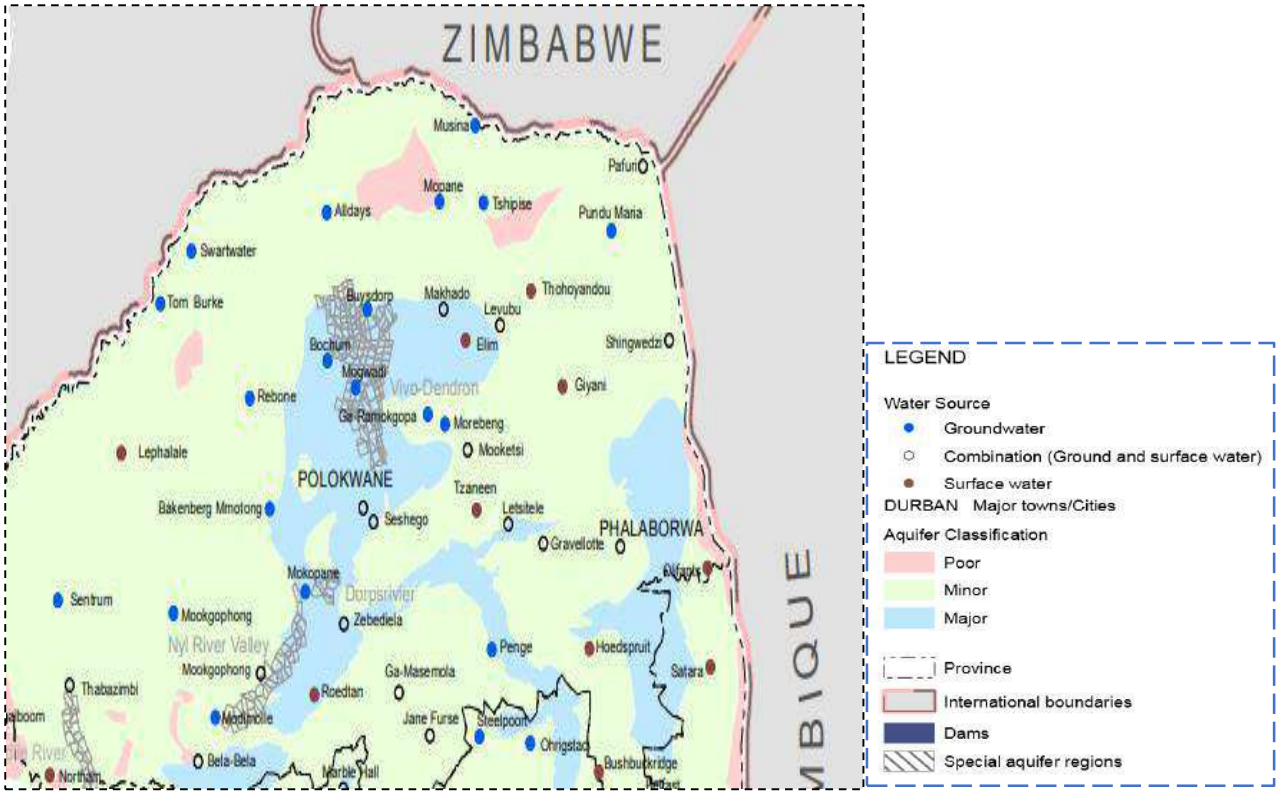

Figure 2: Aquifer classification of South Africa

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Table 1: Aquifer characterization

Aquifer	Description
Sole source aquifer	An aquifer used to supply 50% or more of urban domestic water for a given area, for which there are no reasonably available alternative sources should this aquifer be impacted upon or depleted.
Major aquifer region	High-yielding aquifer of acceptable quality water.
Minor aquifer region	Moderately yielding aquifer of acceptable quality or high yielding aquifer of poor-quality water.
Poor aquifer region	Insignificantly yielding aquifer of good quality or moderately yielding aquifer of poor quality, or aquifer that will never be utilized for water supply and that will not contaminate other aquifers.
Special aquifer region	An aquifer designated as such by the Minister of Water

6 Groundwater Modelling

6.1 Software model choice

MODFLOW software is the chosen software to model groundwater flow and contaminant transport in this situation. The finite difference numerical model was created using the US Department of Defence Groundwater Modelling System (GMS9.2) as Graphical User Interface (GUI) for the well-established MODFLOW and MT3DMS numerical codes.

MODFLOW is a 3D, cell-centred, finite difference, saturated flow model developed by the United States Geological Survey. MODFLOW can perform both steady state and transient analyses and has a wide variety of boundary conditions and input options. It was developed by McDonald and Harbaugh of the US Geological Survey in 1984 and underwent eight overall updates since. The latest update (MODFLOW-NWT) incorporates several improvements extending its capabilities considerably, the most important being the introduction of the Newton formulation of MODFLOW. This dramatically improved the handling of dry cells that has been a problematic issue in MODFLOW in the past.

MT3DMS is a 3-D model for the simulation of advection, dispersion, and chemical reactions of dissolved constituents in groundwater systems. MT3DMS uses a modular structure similar to the structure utilized by MODFLOW and is used in conjunction with MODFLOW in a two-step flow

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and transport simulation. Heads are computed by MODFLOW during the flow simulation and utilized by MT3DMS as the flow field for the transport portion of the simulation.

Elevation data is crucial for developing a credible numerical model, as the groundwater table in its natural state tends to follow topography. The best currently available elevation data is derived from the SRTM (Shuttle Radar Tomography Mission) DEM (Digital Elevation Model) data. The SRTM consisted of a specially modified radar system that flew on board the Space Shuttle Endeavour during an 11-day mission in February of 2000, during which elevation data was obtained on a near-global scale to generate the most complete high-resolution digital topographic database of Earth. Data is available on a grid of 30 meters in the USA and 90 meters in all other areas.

6.2 Model set-up and boundaries

During model setup, the conceptual model is translated into a numerical model. This stage entails selecting the model domain, defining the model boundary conditions, discretizing the data spatially and over time, defining the initial conditions, selecting the aquifer type, and preparing the model input data. The above conditions together with the input data are used to simulate the groundwater flow in the model domain for pre steady state conditions.

6.3 Groundwater sources and sinks

Following the characterization of the aquifers, contaminant sources and groundwater receptors, the conceptual model was transformed into a numerical model so that the groundwater flow conditions, and mass transport can be solved numerically. A conceptual model is a simplified, but representative description of the groundwater system that illustrates the interaction of the sources, pathways and receptors at the site.

- The **sources** represent any entity that contributes to the groundwater quantity and/or quality
- The **pathways** are the aquifers through which the groundwater and contaminants migrate and
- The **receptors** are humans, rivers or natural ecosystems that depend on the groundwater and will be impacted negatively if the water is depleted by dewatering or is contaminated.

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6.4 Model results

Prior to the drilling of the prospecting boreholes, a baseline steady state groundwater flow model was set-up and calibrated. The objective of the steady state model is to simulate the undisturbed groundwater system in the region prior to commencement of prospecting activities. The impacts of the prospecting activities can then be determined by comparing the transient state results with the steady state results. Groundwater flow model was developed to determine the flow direction as well as flow velocity of water before any disturbances to the natural environment.

6.4.1 Groundwater flow model

Before any activity can take place, the surrounding environment and the groundwater will not be affected by solute contamination. The concentration of possible contaminants is assumed to be zero, therefore we will only have a groundwater flow model illustrating how the groundwater is flowing before any activity commence.

Groundwater flow model was developed to determine the flow direction as well as flow velocity of water before the mining activity could commence.

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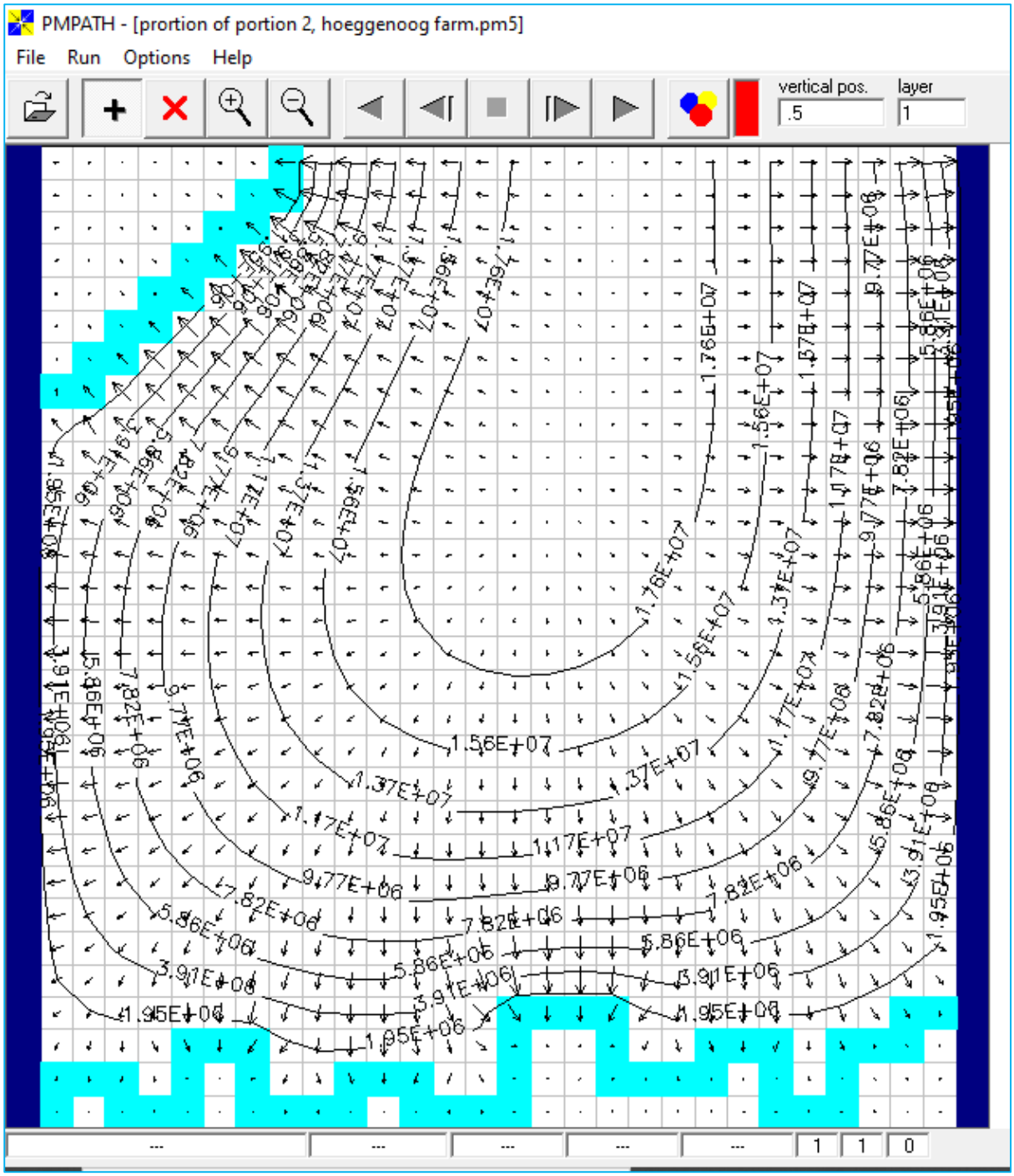

Figure 3: Groundwater flow model

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7 Geohydrological impacts

During the prospecting phase for Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite the following impacts are envisioned:

- Clearing of vegetation leading to increased runoff and less infiltration.
- Diesel and oil spillages from the drill rig
- Increase in volume of contaminated water that needs to be managed within the footprint
- Erosion of stream banks as a result of crossings and diversions leading to siltation of the streams

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Table 2: Groundwater impact assessment

Prospecting right impact assessment table						
Name of Company: Singo Consulting (Pty) Ltd			Sector: Environmental Consulting firm			
Department: Land and water division						
Risk Assessment						
Potential environmental impact	**Cause of the impact**	**Recommended measures/remarks for mitigation**	**Impact risk before mitigation**	**Impact risk after mitigation**	**Responsible person(s)**	**When mitigation should be implemented**
Fuel & hydrocarbon spills	Drill rig, trucks and cars	Clean up immediately after accidental spills & Divert run-off from highways that may contain hydrocarbons into pollution control dams to regulate the pollution. Providing spill absorbing material All equipment utilizing hydrocarbons will be stored on a hard-standing surface Vehicles and machinery will need to be maintained in good order to minimize leakages			The project management team	During the prospecting activities
Aquifer contamination	During drilling exploration boreholes	• Install casing and rehabilitate the exploration boreholes • Take water samples from the drilled boreholes			The project management team	After drilling
Clearing of vegetation leading to increased runoff and less infiltration	During pegging, and preparation of the drilling yard	• Rehabilitate the site by using a hoe to dug the compacted soil or a tractor.			The project management team	After pegging and drilling

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Surface water contamination	• Washing of working equipments machinery • Using water from the river to operate the drill rig	• Avoid drilling near surface water • Do not wash equipments and vehicles at or near water bodies • Conduct prospecting during dry seasons when the water percentages in wetlands and rivers are very low • All the wetlands and rivers will need to be buffered as no go area			The project management team	During prospecting period
Erosion of stream banks as a result of crossings and diversions leading to siltation of the streams	During prospecting activities like logging and sampling	Do desktop study and avoid working near the water bodies			Prospecting team	During the prospecting phase
Soil compaction	During constructing gravel roads to access the site	Rehabilitate these roads by digging with tractors and ploughing vegetation			The project management team	After the prospecting phase
Water and soil contamination	Core logging	The core logs of boreholes with mineral of interest should be cleared from the ground immediately after logging by the geologists to prevent washing and leaching to the water resources during rainfall			The project management team	After the prospecting phase
Impact Classification						
Low environmental Impact.		Medium environmental Impact		High environmental impact	Very High environmental impact	

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8 Conclusions and recommendations

- It can be concluded that the prospecting activity will cause minimal impact on the water resources. The prospecting right activity should take place during dry seasons where the water percentages in the surrounding streams and wetlands are very low.
- Drilling activity should not be conducted near these water resources, the exploration geologists will be advised to drill and sample away from non-perennial rivers and wetlands on site.
- The exploration boreholes should be cased during drilling and properly rehabilitated after drilling.
- Extreme caution should be taken during prospecting, owing to the non- perennial rivers, dam and numerous wetlands existing within and nearby the project area. No washing of any mechanical equipments or vehicles will be allowed near the water resources.
- All the wetlands and non-perennial rivers will be buffered as no go area preferably a 100m buffer will apply.
- Absorbent Spill kits must be made available near the drill rigs during drilling activities. The oil absorbent chemicals will ensure that no oils infiltrate down to the underground to cause any groundwater contamination.
- The core logs of boreholes with mineral of interest should be cleared from the ground immediately after logging by the geologists to prevent washing and leaching to the water resources during rainfall

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Appendix

Site pictures

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BASIC HYDROLOGICAL STUDY FOR PROSPECTING RIGHT APPLICATION

DC ORE MINERALS AND ENERGY

Prospecting Right and Environmental Authorization application for Chrome ore, Copper ore, Andalusite, Iron ore and Sillimanite resources with an extent of approximately 1054, 875244 ha on the Farm Hooggenoeg 293 KS situated under the Lepelle Nkumpi Local Municipality, Limpopo Province.

DMRE REF NO: LP 30/5/1/1/2/13799 PR

PREPARED BY:

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2021

PROJECT INFORMATION

Report type	Hydrological Report
Project Title	Prospecting Right Application for Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources on the farm Hooggenoeg 293 KS within the Lepelle-Nkumpi local municipality, Limpopo province.
Mineral	Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite, Resources
Site Location	Magisterial District of Lepelle-Nkumpi, Limpopo Province
Compiled for	DC Ore Minerals and Energy
	Electronic Signatures
Lead Author	Talelani A Singo (Land and Water Division Lead)
Date	18 January 2021

DECLARATION:

This is a legally binding document and many of the actions and recommendations remain the responsibility of the client (as the owner/lessee of the property).

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EXECUTIVE SUMMARY

Singo Consulting (Pty) Ltd was appointed by DC Ore Mienarls and Energy to conduct a Hydrological study for the Prospecting Right for Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources on the Farm Hooggenoeg 293 KS within the Lepelle-Nkumpi local municipality, Limpopo province.

Terms of reference

This project involves the compilation of a specialist surface water report for the proposed mine. This includes the following aspects:

- Baseline assessment.
- Impact assessment and mitigation measures.

Environmental Legislation - DWAF Government Notice 704

Government Notice 704 (Government Gazette 20118 of June 1999) (hereafter referred to as GN 704), was established to provide regulations on the use of water for mining and related activities aimed at the protection of water resources. Whilst the proposed ferrochrome smelter is not a mine, it is a related activity; more specifically it is a mineral processing facility, as listed under GN 704. Therefore, the proposed infrastructure is designed in accordance with GN 704, and the following design principles are applicable:

- *Condition 4* which defines the area in which, mine workings or associated structures may be located, with reference to a watercourse and associated flooding. Any residue deposit, dam, reservoir together with any associated structure or any other facility should be situated outside the 1:100-year flood-line. Any underground or opencast mining, prospecting or any other operation or activity should be situated or undertaken outside of the 1:50 year flood-line. Where the flood-line is less than 100 metres away from the watercourse, then a minimum watercourse buffer distance of 100 metres is required for infrastructure and activities.

- *Condition 5* which indicates that no residue or substance which causes or is likely to cause pollution of a water resource may be used in the construction of any dams, impoundments or embankments or any other infrastructure which may cause pollution of a water resource.

- *Condition 6* which describes the capacity requirements of clean and dirty water systems. Clean and dirty water systems must be kept separate and must be designed, constructed, maintained and operated to ensure conveyance of flows of a 1:50 year

recurrence event. Clean and dirty water systems should not spill into each other more frequently than once in 50 years. Any dirty water dams should have a minimum freeboard of 0.8m above full supply level.

- *Condition 7* which describes the measures which must be taken to protect water resources. All dirty water or substances which may cause pollution should be prevented from entering a water resource (by spillage, seepage, erosion etc) and ensure that water used in any process is recycled as far as practicable.

- *Condition 10* which describes the requirements for operations involving extraction of material from the channel of a watercourse. Measures should be taken to prevent impacts on the stability of the watercourse, prevent scour and erosion resulting from operations, prevent damage to in-stream habitat through erosion, sedimentation, alteration of vegetation and flow characteristics, construct treatment facilities to treat water before returning it to the watercourse, and implement control measures to prevent pollution by oil, grease, fuel and chemicals.

METHODOLOGY

A desktop study was conducted to evaluate current and previous land uses to assess the implications for hydrology contaminations.

Software employed in the study includes:

- QGIS 2.14.9 for Geographic Information Systems (GIS) work and
- Design Rainfall Estimation package (Smithers and Schulze, 2003) for 24 design rainfall depth;

A site visit was conducted in order to obtain information on normal flow rates, river health and potential factors that could influence hydrological modelling of flows.

The likely surface water impact associated with the planned mining development was identified and possible mitigation measures were recommended to reduce the impacts thereof.

MONITORING PLAN

The objective of the surface water management and monitoring measures is to minimise the impact on surface water dependent systems to be retained from disturbance within and adjacent to controlled sites; to maintain hydrological regimes of surface water so that the environmental values are protected and , to check compliance with license requirements and for reporting purposes.

CONCLUSION

- It can be concluded that the Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources prospecting will cause minimal impact on the water resources. The prospecting right activity should take place during dry seasons where the water percentages in the surrounding streams and wetlands are very low.
- Drilling activity should not be conducted near these water resources, the exploration geologists will be advised to drill and sample away from rivers and wetlands on site.
- Extreme caution should be taken during prospecting, owing to the perennial rivers, non-perennial rivers and the wetlands existing within the project area. No washing of any mechanical equipment or vehicles will be allowed near the water resources.
- All the wetlands and non-perennial streams will be buffered as "no go" area preferably a 100m buffer will apply.

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ACRONYMS AND ABBREVIATIONS

Acronyms / Abbreviations	Definition
AMSL	Above Mean Sea Level
DDF	Depth-Duration-Frequency
DWA	Department of Water Affairs
MAP	Mean Annual Precipitation
SANRAL	South African National Road Agency
SAWS	South African Weather Services

1 INTRODUCTION

Singo Consulting (Pty) Ltd was appointed by DC Ore Mienarals and Energy to conduct a Hydrological study for the Prospecting Right Application which has been submitted for the prospecting of application for Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources on the farm Hooggenoeg 293 KS within the Lepelle-Nkumpi local municipality, Limpopo province.

This report is not planned to be an intensive description of the proposed project; however, it is conducted as a specialist surface water study providing the surface water information required for the environmental authorisations for the proposed prospecting project.

1.1 OBJECTIVES AND AIMS OF THE STUDY

The overall objective of this desktop hydrological study entails to:

- Identify the potential for surface contamination within the study area and the nature of likely contaminants to be encountered where Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources prospecting will take place;
- Gathering all the relevant information and recommendations in a hydrological report, prepared in such a way that it can be included into the Environmental Management Program document.

1.2 LOCALITY

A locality map created by QGIS software illustrates detailed and comprehensive information regarding the surrounding settlements and infrastructure of the proposed project area. The proposed project area located approximately 15.69 km North East of Bogalatladi and approximately 5.57 km North West of Tubex. The map below shows the locality of the study area.

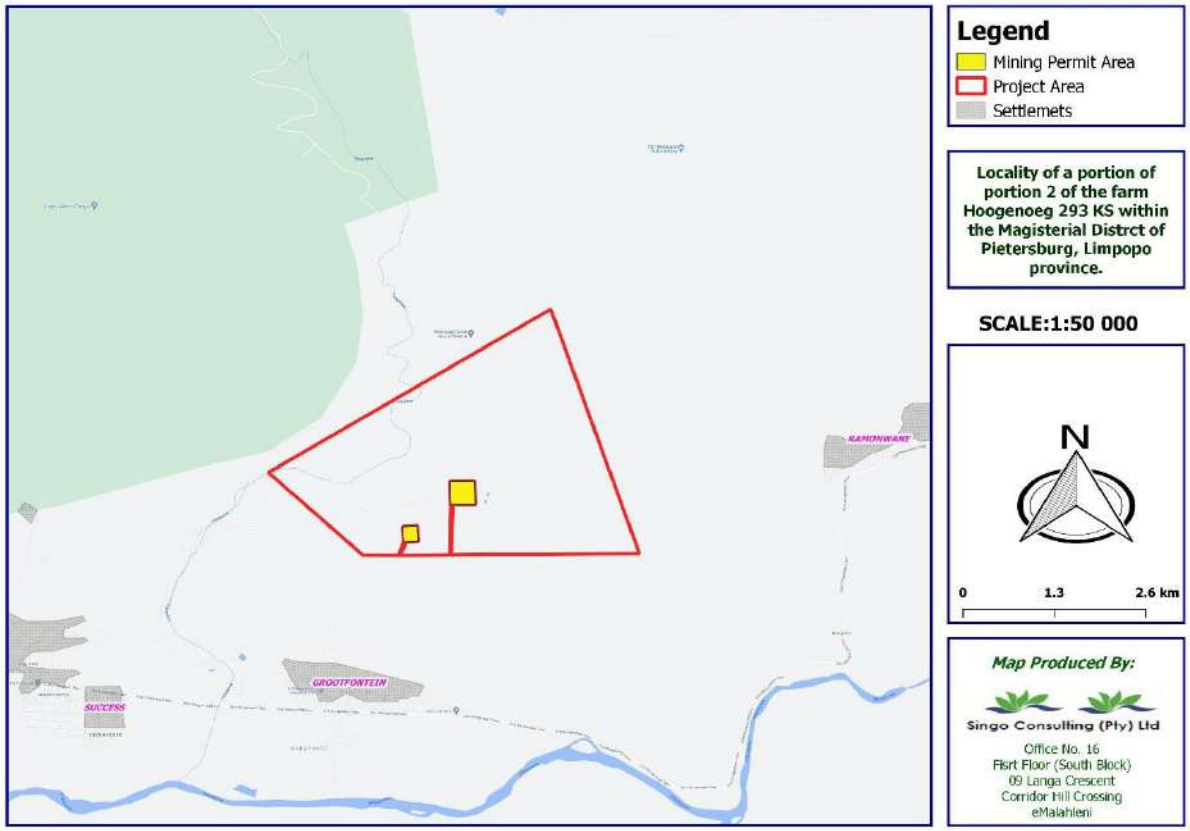

Figure 1- 1: Locality Map

2 SCOPE OF WORK

The scope of work included the following:

- Baseline study
  - Site visit to correlate the information that was collected during the desk study.
  - Maps from the hydrology study will be used to indicate the catchment areas and any strategic points.
  - The Mean Annual Runoff (MAR), peak flow rates and volumes will be estimated for these catchments using WR2012 data.
- Impacts assessment
  - All surface water impacts will be described, and mitigation measures will then be proposed as normally required for the Environmental Impact Assessment/Environmental Management Plan (EIA/EMP), for the construction, operation, decommissioning and post closure phases.

3 METHODOLOGY

3.1 DESKTOP STUDY

A desktop study was conducted to evaluate current and previous land uses to assess the implications for hydrology contaminations. The desktop study included:

- Assessment of historical aerial photography for the precinct and surrounding areas;
- A desk study to collect background information regarding climate, rainfall, geology and hydrology structures within the proposed development area. This information will aid in conforming calculated decisions regarding the development of the proposed prospecting project with respect to possible associated impacts on the local surface water regime;
- Software employed in the study area was QGIS 2.14.9 for Geographic Information Systems (GIS) work.
- Review and summary of any previous reports or studies regarding environmental, geological or groundwater conditions, in or within the vicinity of the study area.

4 OVERVIEW OF RELEVANT LEGISLATION AND STANDARDS

4.1 LEGAL FRAMEWORK

DWA's vision for water quality management in South Africa is to:

- ensure the continuous improvement of Water Quality Management
- become a recognized world leader in Water Quality Management
- be proactive, dynamic, efficient, and effective in its delivery of services to the public
- provide the necessary policies and systems to ensure integrated sustainable management of water quality
- promote cooperative governance across all spheres of management and
- ensure a fully capacitated, loyal workforce to support its functions

4.2 NATIONAL LEGISLATION

National legislation applicable to surface water management includes:

- Constitution of the Republic of South Africa, 1996 (No. 108 of 1996) – The Bill of Rights states that everyone has the right to an environment that is not harmful to their health or well-being.
- National Water Act, 1998 (Act 36 of 1998) – Provides for the protection of the quality of water and water resources in South Africa and provides for the establishment of Water Management.

4.3 NATIONAL POLICY/GUIDELINES

National policy and guidelines applicable to surface water management includes:

- South African Water Quality Guidelines, First Edition, 1996 – These guidelines set out the minimum water quality requirements for a range of water quality parameters for each water user.
- Development of a Waste Discharge Charge System: Framework Document. Second Edition, 2000 – Provides a framework for the implementation of a system to charge for water use such as the discharge of waste that impacts on water resources.
- Best Practice Guidelines for the mining sector, DWAF 2006, 2008 dealing with aspects of DWA's water management hierarchy and deals with integrated mine water management, pollution prevention and minimisation of impacts, water reuse and reclamation and water treatment.
- Best Practice Guidelines for the mining sector, DWAF 2006, 2008 dealing with general water management strategies, techniques and tools which could be applied cross – sectorial and deals with storm water management, water and salt balances, water monitoring systems, impact prediction.
- Best Practice Guidelines for the mining sector, DWAF 2006-2008 dealing with specific mining activities and addresses the prevention and management of impacts from small scale mining, water management for Mine Residue Deposits, pollution control dams, water management for surface mines, and water management for underground mines.

5 BASELINE ENVIRONMENTAL DESCRIPTION

5.1 CLIMATE

Polokwane lies on 1303m above sea level and the climate here is considered to be a local steppe climate. There is not much rainfall in Polokwane all year long. The climate here is classified as BSk by the Köppen-Geiger system. The temperature here averages 17.3 °C. The annual rainfall is 598 mm. The driest month is July, with 5 mm of rain. In January, the precipitation reaches its peak, with an average of 110 mm. January is the warmest month of the year. The temperature in January averages 21.3 °C. At 11.5 °C on average, June is the coldest month of the year. There is a difference of 105 mm of precipitation between the driest and wettest months. The variation in annual temperature is around 9.8 °C.

5.2 TOPOGRAPHY

Topography is the study of the shape and features of land surfaces. The topography of an area could refer to the surface shapes and features themselves, or a description (especially their depiction in maps). Topography is a field of geoscience and planetary science and is concerned with local detail in general, including not only relief but also natural and artificial features, and even local history and culture. This meaning is less common in the United States, where topographic maps with elevation contours have made "topography" synonymous with relief.

The slope within and around the project area is not uniform and this is evident by the contour lines which are neither evenly nor parallel spaced. The proposed prospecting area is situated within a region characterized hills topography of the farm Hooggenoeg 293 KS. This can be observed on the topology map attached below as the altitude is generally on average of 840-1550 metres above sea level. See Figure 5-2 below.

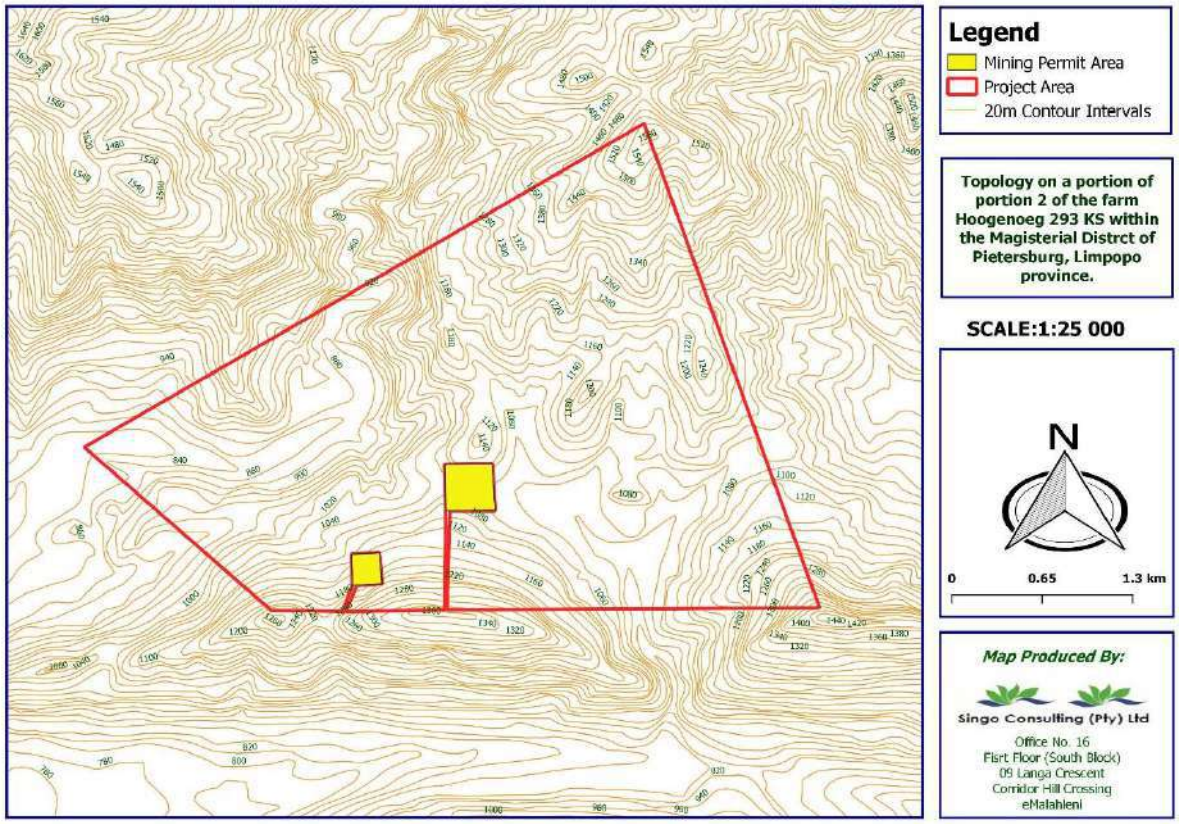

Figure 5- 1: Topographical and Hydrological Map

5.3 GEOLOGY

5.3.1 REGIONAL GEOLOGY

Transvaal Supergroup

The Transvaal Supergroup is preserved within three basins on the Kaapvaal craton, Kanye in Botswana, and the Transvaal and Griqualand West basins in SA. For much of the lower part of the Transvaal, deposition of these sediments took place within one large epeiric basin, and the three basins preserved now represent only remnants of that very large depository. For the upper parts of the Transvaal Supergroup, deposits in the three basins tend to be different and at least partly unique to each preserved basin. Age of the Transvaal Suprgroup is from c. 2660 Ma for the basal "protobasinal rocks", found only at the base of the Transvaal sub-basin succession, to c. 2.6-2.4 Ga for the chemical sediments of the Chuniesport-GhaapTaupone Groups (single chemical basin across much of the craton), to the Pretoria Group which is not accurately dated, but which is c. 2.3-2.1 Ga.

The uppermost units, the Rooiberg Group and overlying lavas and sediments of the Loskop, Rust de Winter and Glentig Formations, although stratigraphically part of the Transvaal

Supergroup, really represent genetically, the onset of the Bushveld Complex, which intruded into the Transvaal (sub-) basin. The succession in the latter basin is the thickest and reaches up to about 12 km, with only about 4-5 km being preserved in the Griqualand West sub-basin.
Transvaal sedimentation began at least 2.6 Ga ago in the Transvaal sub-basin, and early protobasinal rocks (a purely descriptive term) may have been coeval with late stage Ventersdorp Supergroup events. Alternatively, and more likely, they reflect local rifted basins within the Kaapvaal craton, formed as a result of stresses on that craton during the Limpopo mobile belt collision, and in which immature alluvial sediments and acid-to mafic lavas were deposited.

Uppermost protobasinal rocks are much more widespread, linking these various protobasinal rifts and reflect deeper water more mature sedimentation – they likely reflect a foreland basin resulting from the uplifted Limpopo orogen. The protobasinal rocks are unconformably overlain by the thin (10-60 m) sheet sandstones of the Black Reef Formation in the Transvaal sub-basin, which were laid down by rivers. At about the same time, in the Griqualand West subbasin, sedimentation began with the mixed clastic and chemical shallow marine shoreline and continental deposits (plus minor lavas) of the Schmidtsdrif Subgroup.

Thereafter, at c. 2.58 Ga, all three Transvaal subbasins and much of the Kaapvaal craton were drowned by a rise in global sea levels, probably related to high rates of continental crustal growth globally. Much of the craton was now covered by a shallow sea, with water depths of 100-200 m, and in which limestone deposits, minor shale and some chert were laid down. These sediments were often trapped by very large cyancobacterial colonies which thrived in the clean shallow epeiric sea conditions, and, as they were photosynthetic, produced oxygen which was taken up by the seawater and which later oxidised the iron minerals deposited above the carbonate rocks in the then deeper (c. 200m) epeiric sea (ie Penge Fm. In Transvaal sub-basin, and Asbesheuwels Subgroup in Griqualand-West).
Sea levels rose and fell four times during deposition of the Chuniespoort and Ghaap Groups, and deposition of the uppermost iron formations was most likely related to widespread seafloor volcanism (i.e. fumaroles) in deeper water areas adjacent to the Kaapvaal craton. Mixed clastic and chemical sediments in the Koegas Subgroup represent the shrinking epeiric sea and its final retreat off the Kaapvaal craton, while the Duitschland Formation in the Transvaal sub-basin largely reflects weathering and reworking of Chuniespoort rocks.
Following a major, regional unconformity and significant time gap, sedimentation continued separately in the Transvaal and Griqualand West sub-basins. In the Transvaal sub-basin, the Pretoria Group (largely alternating shales and sandstones, lesser andesitic lavas and minor conglomerates, ironstones) reflects two rifting events, during which alluvial deposits, volcanic

rocks and some lakes formed, followed in each case by slower thermal subsidence, when sea level rose and drowned the basin, and in which deeper water shales and coastal sandstones were laid down, by a general clastic, shallow epeiric sea.

A major andesitic flood basalt (Hekpoort Formation) was associated with the onset of the second rifting event, and covered the Kaapvaal craton as far as the Griqualand West sub-basin, where it is known as the Ongeluk Formation. In the Griqualand West sub-basin, this is underlain by the Makganyene Diamictite Formation, probably of glacial origin. Above the Ongeluk are two chemical sedimentary formations (Hotazel and Mooidraai), which contrast to the much thicker and clastic sedimentary succession of the Pretoria Group.

Finally, for the Transvaal sub-basin, impingement of the large Bushveld Complex (2053 Ma) mantle plume at the base of the Kaapvaal craton resulted in partial melting of this craton, and the outflow of the thick (up to 7 km) Rooiberg acidic lavas. They were laid down in faulted smaller basins, associated with irregular occurrences of immature continental sediments.

5.3.2 LOCAL GEOLOGY

The Hooggenoeg 293 KS farm is located within the Duitschland, Klapperkop quartzite and Timeball Hill formation; however the underlying geology specific to the mining permit is the Klapperkop quartzite and Timeball Hill formation. The thick shales and subordinate sandstones of the Timeball Hill formation are generally ascribed to a fluvio-detltaic basin fill sedimentation system (Erikson, 1973). A basal black shale facies, associated basin- wide in the subsurface with lavas and pyroclastic rocks of the Bushy Bend lava member reflects suspension sedimentation and fumarolic eruptions. Succeeding rhythmically interbedded mudstones/ siltstones and fine-grained sandstones are interpreted as turbidite deposits (Kuenen, 1963; Button, 1973). These grades up into the medial Klapperkop Quartzite member interpreted as fluvio-deltaic sandstones which fed the more distal turbidites, tidal reworking of these sands is also inferred.

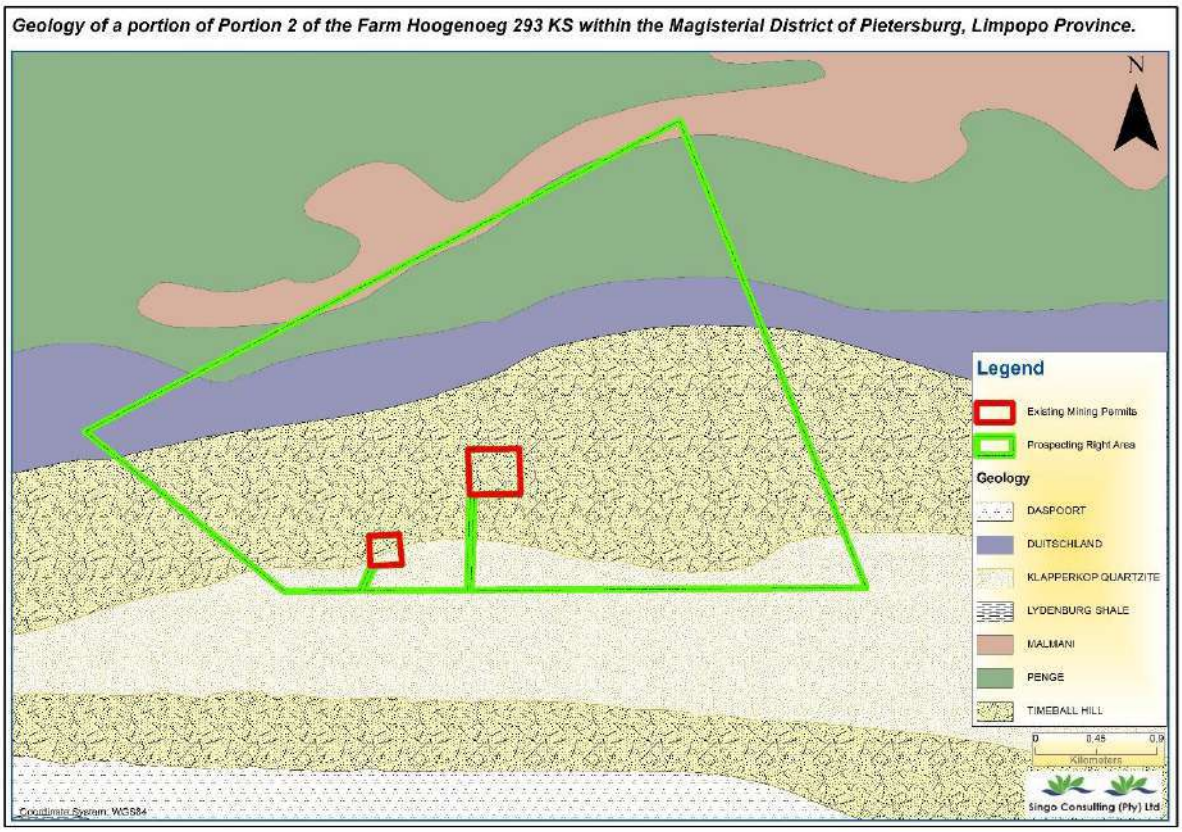

Figure 5-2: Geology Map

5.4 HYDROLOGICAL DESCRIPTION

5.4.1 HYDROLOGY

The proposed project area falls within the Olifants Water Management Area between the Quaternary Catchments B71B and B71A. The hydrology surrounding the proposed area is very important during prospecting. In this context hydrology is all the surface waters appearing within and nearby the proposed project area, where a potential to be impacted upon by the project exist. The hydrology map, illustrates that the following water bodies exists:

- Channelled valley-bottom wetland
- Unchanneled valley-bottom wetland
- Non- perennial river
- Perennial river

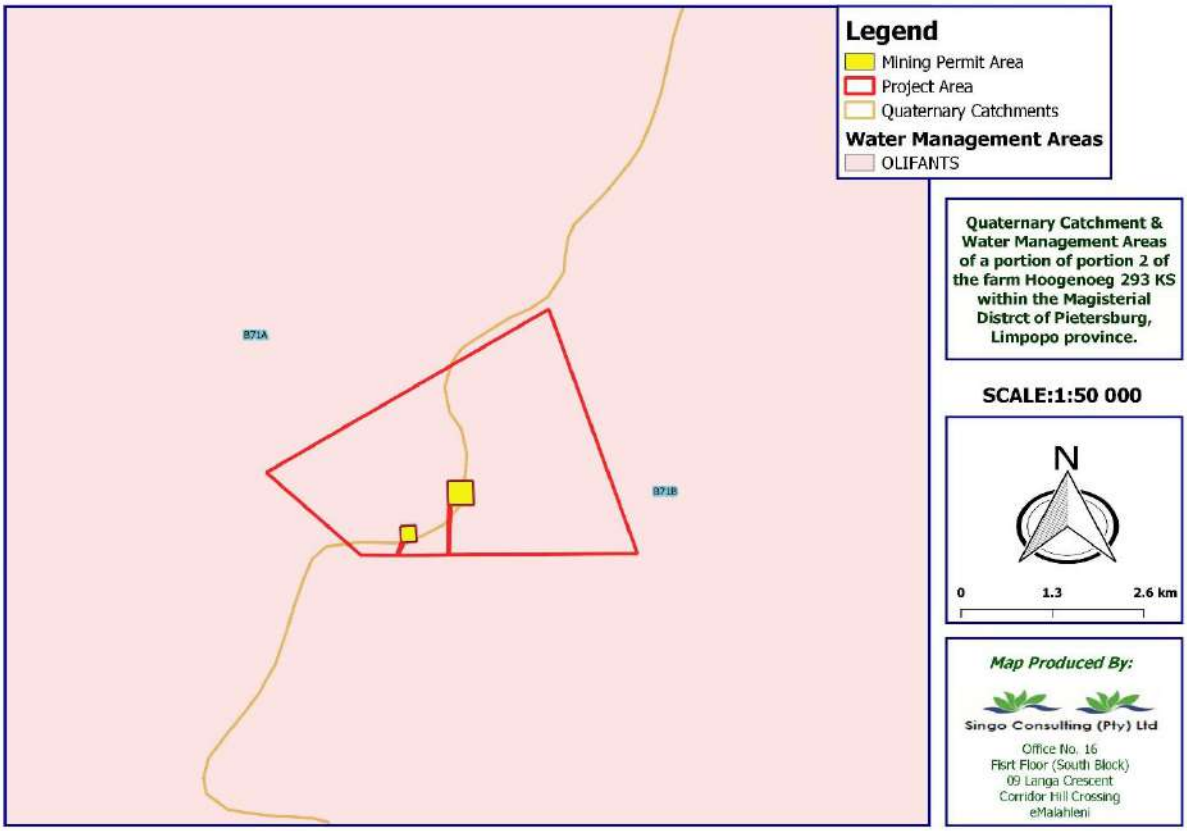

FIGURE 5-3: Quaternary Catchment and WMA

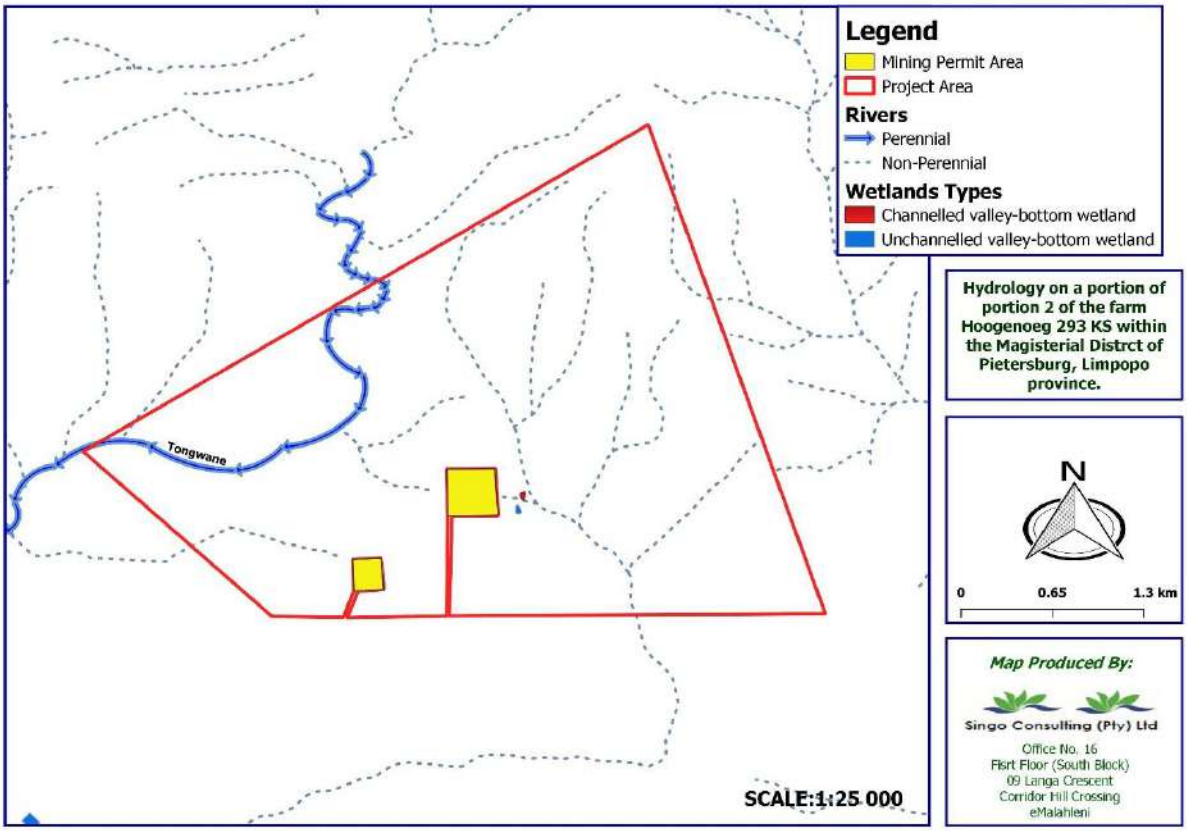

FIGURE 5- 4: Hydrological Map

6 SURFACE WATER IMPACT ASSESSMENT

This Environmental Management Programme report (EMPr) addresses the management of potential environmental impacts related to the proposed project in respect of surface water and should be used for managing, mitigating, and monitoring of the environmental impacts.

This exercise of risk identification and mitigation involves identification of streams found downstream of the proposed development, as well as a description of the identified risks the environment may incur during the various phases of the project.

The risk rating matrix methodology used is based on the following quantitative measures:

- The probability of impact occurrence;
- The frequency of impact occurrence;
- The special extent of impact occurrence;
- The intensity of impact occurrence; and
- Duration of impact occurrence.

Risk significance value = (magnitude + duration + intensity + frequency) x probability

The maximum value is 18 risk points and ratings are scaled from high, medium to low in respect to their environmental impact. The ranking system used in the study is presented in TABLE 6- 1.

TABLE 6- 1: Risk Assessment Significance Value

The maximum value that can be achieved is 100 Significance Points (SP). Environmental effects were rated as follows:		
Significance	**Environmental Significance Points**	**Colour Code**
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	<-60	H

Status of Impact

+: Positive (A benefit to the receiving environment)

N: Neutral (No cost or benefit to the receiving environment)

-: Negative (A cost to the receiving environment)

Magnitude: =M	***Duration: =D***
10: Very high/don't know	5: Permanent
8: High	4: Long-term (ceases with the operational life)
6: Moderate	3: Medium-term (5-15 years)
4: Low	2: Short-term (0-5 years)
2: Minor	1: Immediate
0: Not applicable/none/negligible	0: Not applicable/none/negligible
Scale: =S	***Probability: =P***
5: International	5: Definite/don't know
4: National	4: Highly probable
3: Regional	3: Medium probability

2: Local	2: Low probability
1: Site only	1: Improbable
0: Not applicable/none/negligible	0: Not applicable/none/negligible

6.1 IMPACTS THAT MIGHT OCCUR

During the Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources prospecting period the following impacts are envisioned:

- Clearing of vegetation leading to increased runoff and less infiltration.
- Diesel and oil spillages from the drill rig
- Increase in volume of contaminated water that needs to be managed within the footprint
- Erosion of stream banks because of crossings and diversions leading to siltation of the streams

6.2 Mitigation

During the Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources prospecting period the following management measures will apply:

- All spillages will need to be cleaned up as soon as practically possible
- Providing spill absorbing material
- All equipment utilizing hydrocarbons will be stored on a hard-standing surface.
- Vehicles and machinery will be maintained in good order to minimize leakages
- Clean up spillages immediately and dispose of contaminated materials to a permitted waste site.

7 MONITORING PLAN

The objective of the surface water management and monitoring measures is to minimise the impact on surface water dependent systems to be retained from disturbance within and adjacent to controlled sites; to maintain hydrological regimes of surface water so that the environmental values are protected and , to check compliance with license requirements and for reporting purposes.

Water dependent systems are parts of the environment in which the composition of species and natural ecological processes are determined by the permanent or temporary presence of flowing or standing surface water or groundwater. The in-stream areas of rivers, riparian

vegetation, springs, wetlands, floodplains, groundwater-dependent terrestrial vegetation are all examples of water dependent systems (Department of Water, January 2013). The objectives of these systems will be achieved if there is no impact on the in-stream and downstream fitness for use criteria.

8 CONCLUSIONS

- It can be concluded that Chrome ore, Copper ore, Iron ore, Andalusite and Sillimanite resources prospecting will cause minimal impact on the water resources. The prospecting right activity should take place during dry seasons where the water percentages in the surrounding streams and wetlands are extremely low.
- Drilling activity should not be conducted near these water resources, the exploration geologists will be advised to drill and sample away from rivers and wetlands on site.
- All the wetlands and non-perennial streams will be buffered as "no go" area preferably a 100m buffer will apply.
- Surface water impacts from the site can be effectively mitigated by applying best practice water management principles.
- The success of surface water impact management will be judged on the basis of successful prevention of spills from the site.

REFERENCE

Darwall, W.R.T., Smith, K.G., Tweddle, D. & Skelton, P.H. (2009). The status and distribution of freshwater biodiversity in southern Africa. Gland, Switzerland: IUCN and Grahamstown, South Africa: SAIAB.120pp.

Department of Water, January 2013. Managing the hydrology and hydrogeology of water dependent ecosystems in urban development, Guidance Note 7.

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION OR FOR A PART TWO AMENDMENT OF AN ENVIRONMENTAL AUTHORISATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED DEVELOPMENT FOOTPRINT ENVIRONMENTAL SENSITIVITY

EIA Reference number: LP 30/1/1/3/2/1(13799) EM

Project name: Farm Hooggenoeg 2/293 KS

Project title: Farm Hooggenoeg 2/293 KS

Date screening report generated: 23/03/2020 12:32:20

Applicant: DC Ore Minerals and Energy

Compiler: Singo Consulting (Pty) Ltd

Compiler signature:

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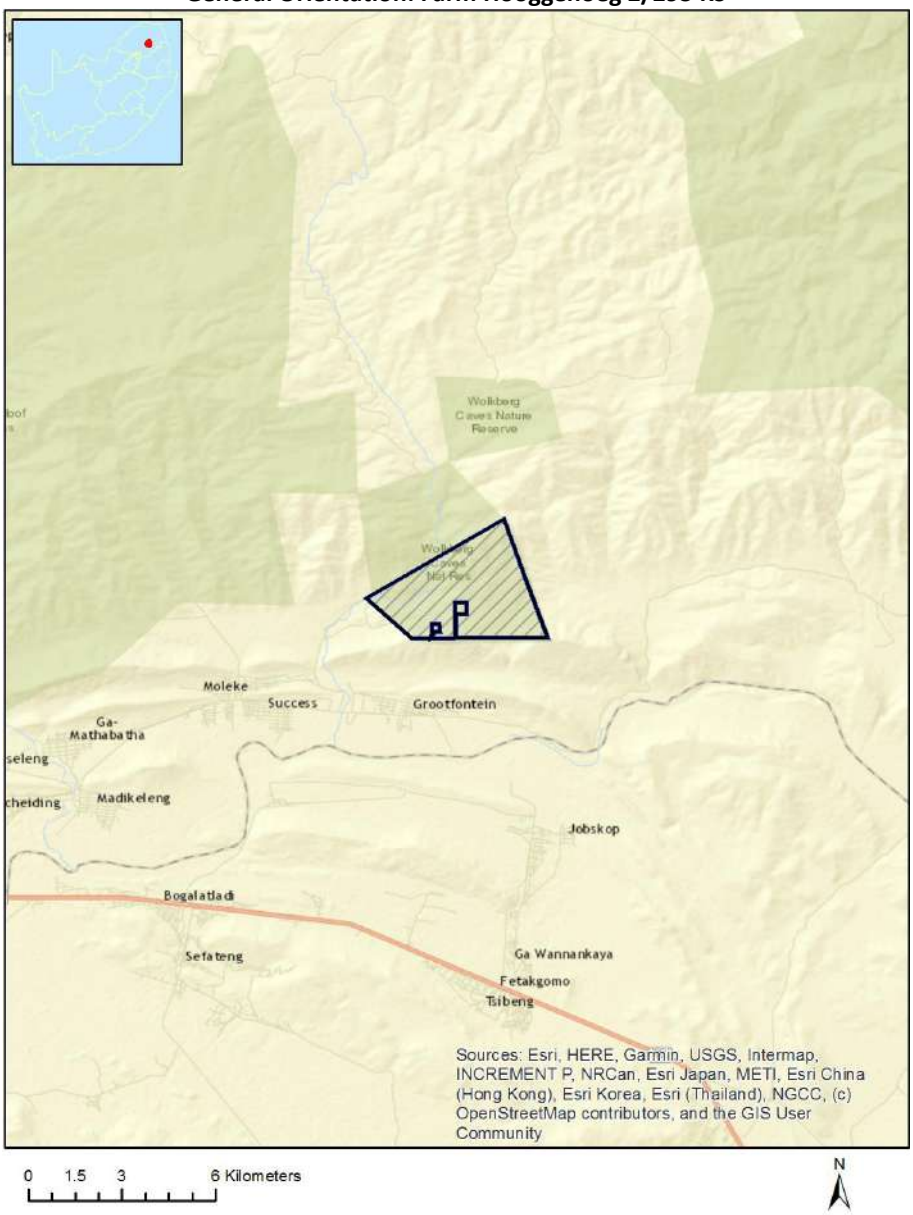
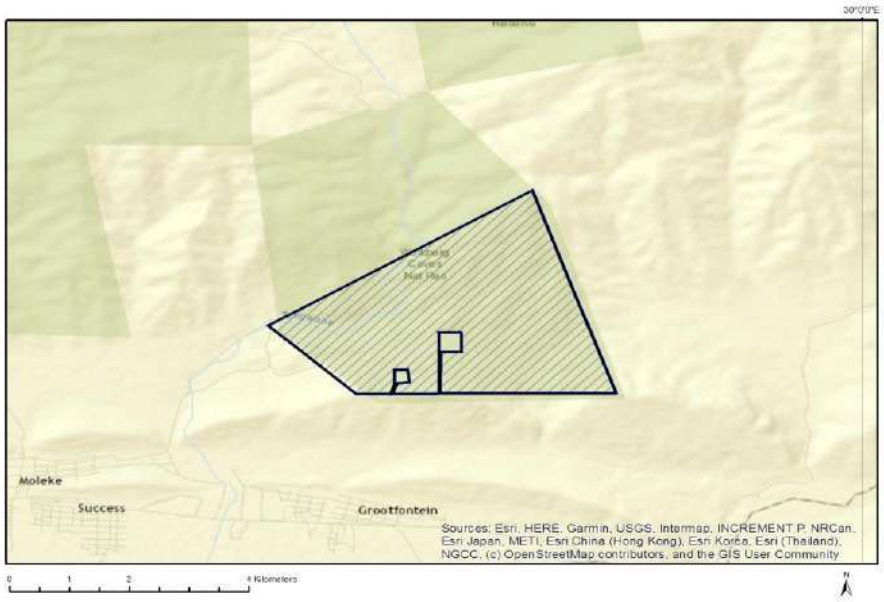
Proposed Project Location

Orientation map 1: General location

General Orientation: Farm Hooggenoeg 2/293 KS



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	UITKYK	294	0	24°11'20.3S	29°54'47.02E	Farm
2	ZUIKERBOSCHPLAAT	281	0	24°11'54.57S	29°56'48.2E	Farm
3	RIETFONTEIN	275	0	24°11'58.38S	29°55'18.51E	Farm
4	COPPER	291	0	24°12'16.13S	29°58'11.46E	Farm
5	HOOGGENOEG	293	0	24°10'14.93S	29°55'55.92E	Farm
6	UITRECHT	299	0	24°8'58.47S	29°57'13.31E	Farm
7	DAVIDSKLOOF	280	0	24°10'21.17S	29°57'43.67E	Farm
8	UITRECHT	299	0	24°8'58.47S	29°57'13.31E	Farm Portion
9	COPPER	291	0	24°12'16.13S	29°58'11.46E	Farm Portion
10	RIETFONTEIN	275	0	24°11'58.38S	29°55'18.51E	Farm Portion
11	UITKYK	294	0	24°11'20.3S	29°54'47.02E	Farm Portion
12	ZUIKERBOSCHPLAAT	281	0	24°11'54.57S	29°56'48.2E	Farm Portion
13	DAVIDSKLOOF	280	0	24°10'21.17S	29°57'43.67E	Farm Portion
14	HOOGGENOEG	293	2	24°10'48.73S	29°56'22.34E	Farm Portion
15	HOOGGENOEG	293	1	24°9'39.78S	29°55'28.42E	Farm Portion

Development footprint[1] vertices:

Footprint	Latitude	Longitude
1	24°9'38.16S	29°57'1.8E
1	24°10'53.03S	29°54'39.24E
1	24°11'31.2S	29°55'26.76E

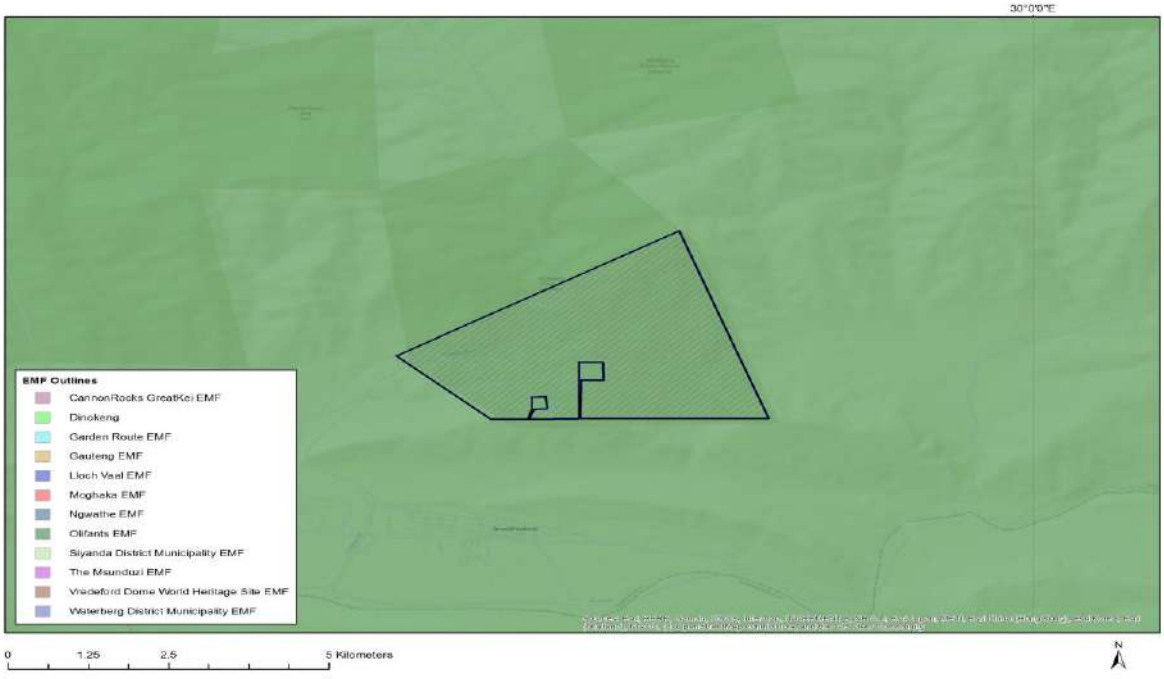
[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

1	24°11'31.2S	29°55'45.12E
1	24°11'25.08S	29°55'47.64E
1	24°11'17.88S	29°55'47.28E
1	24°11'17.52S	29°55'54.48E
1	24°11'24.72S	29°55'55.2E
1	24°11'25.08S	29°55'48.72E
1	24°11'31.2S	29°55'45.84E
1	24°11'30.84S	29°56'11.04E
1	24°11'8.16S	29°56'11.4E
1	24°10'57S	29°56'11.04E
1	24°10'57S	29°56'23.28E
1	24°11'7.8S	29°56'23.64E
1	24°11'7.8S	29°56'12.48E
1	24°11'30.84S	29°56'11.76E
1	24°11'30.48S	29°57'46.8E
1	24°9'38.16S	29°57'1.8E

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

Environmental Management Frameworks relevant to the application



Environmental Management Framework	LINK
Olifants EMF	https://screening.environment.gov.za/ScreeningDownloads/EMF/Zone_46,_67,_78,_80,_92,_103,_122,_129.pdf

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmental sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected. The application classification selected for this report is:
Mining|Prospecting rights|Mining - Prospecting rights.

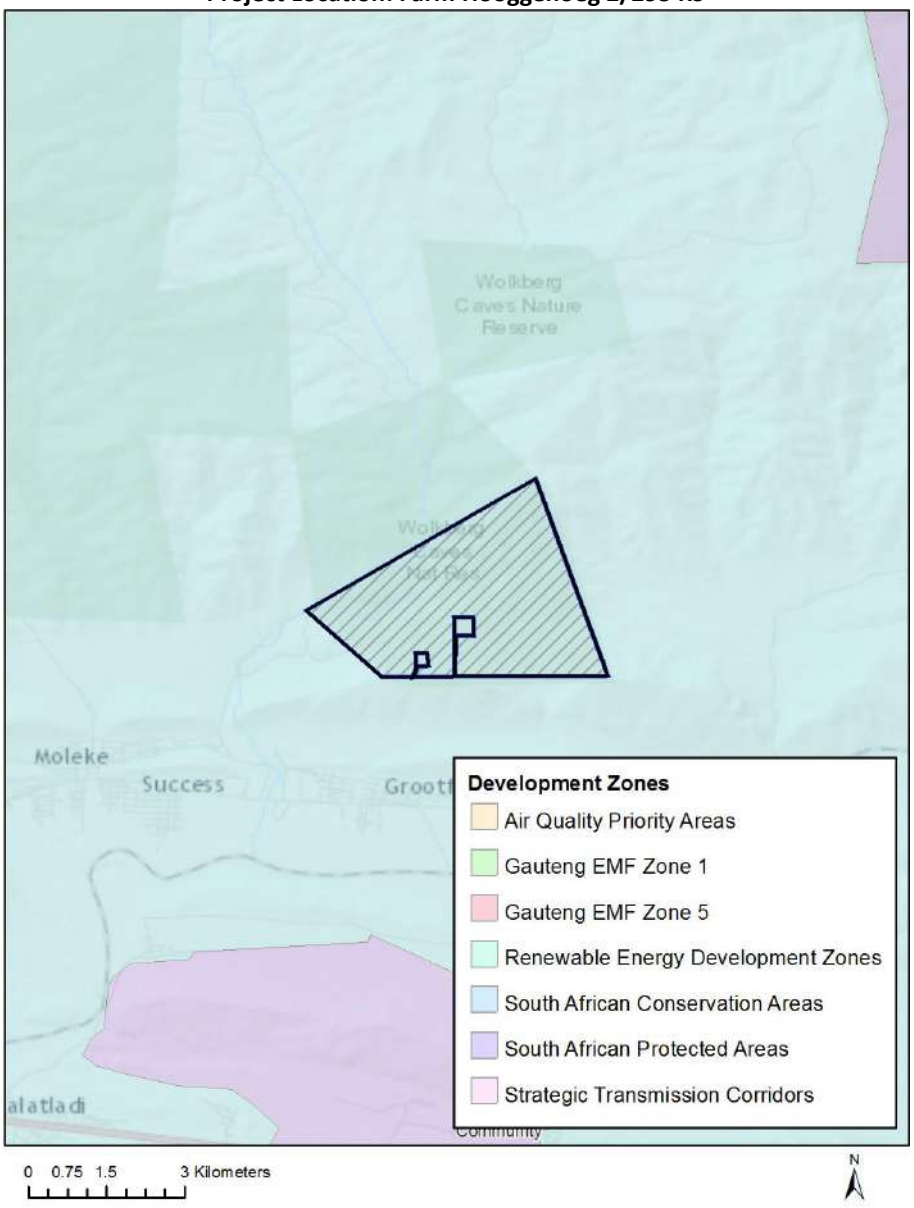
Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this footprint are indicated below.

Incentive, restriction or prohibition	Implication
Strategic Transmission Corridor-International corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/GNR_350_of_13_April_2017.pdf
South African Conservation Areas	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/SACAD_OR_2019_Q4_Metadata.pdf

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones

Project Location: Farm Hooggenoeg 2/293 KS



Proposed Development Area Environmental Sensitivity

The following summary of the development footprint environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	

Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme		X		
Plant Species Theme			X	
Defence Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation.

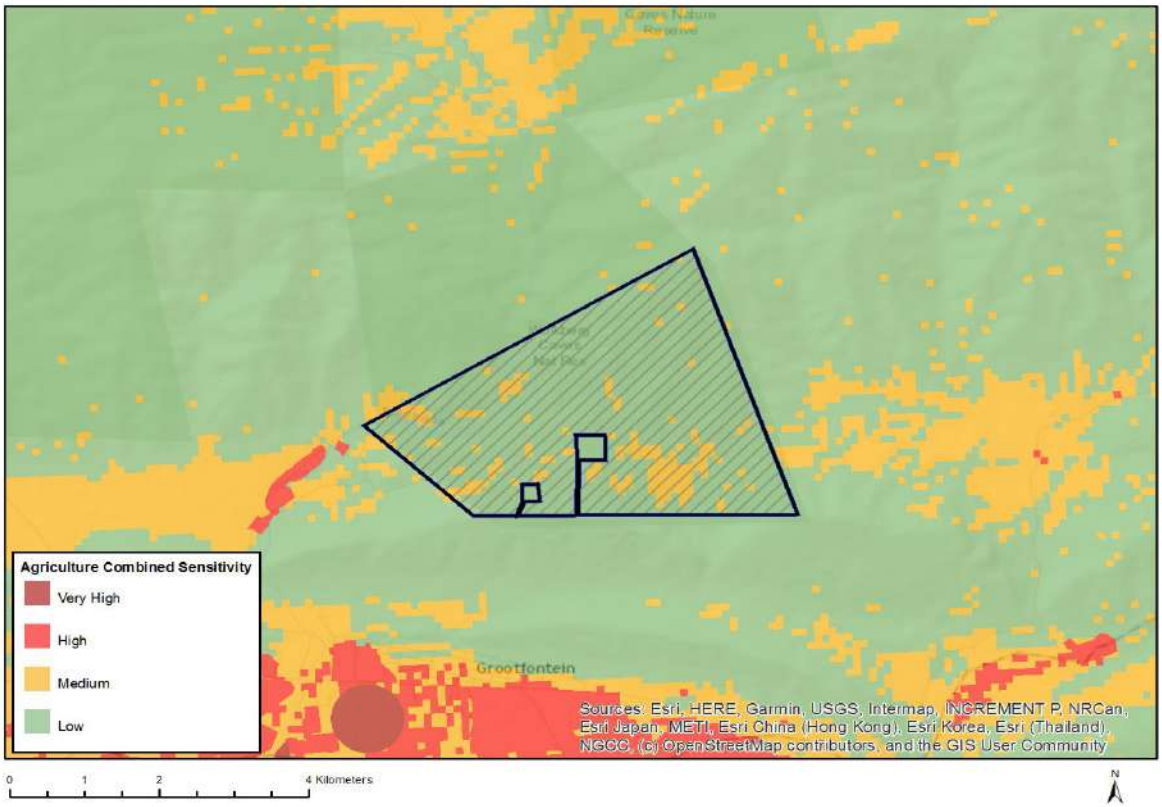
No	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Agriculture_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf
6	Noise Impact Assess	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Noise_Impacts_Assessment_Protocols.pdf

	ment	
7	Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed footprint for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

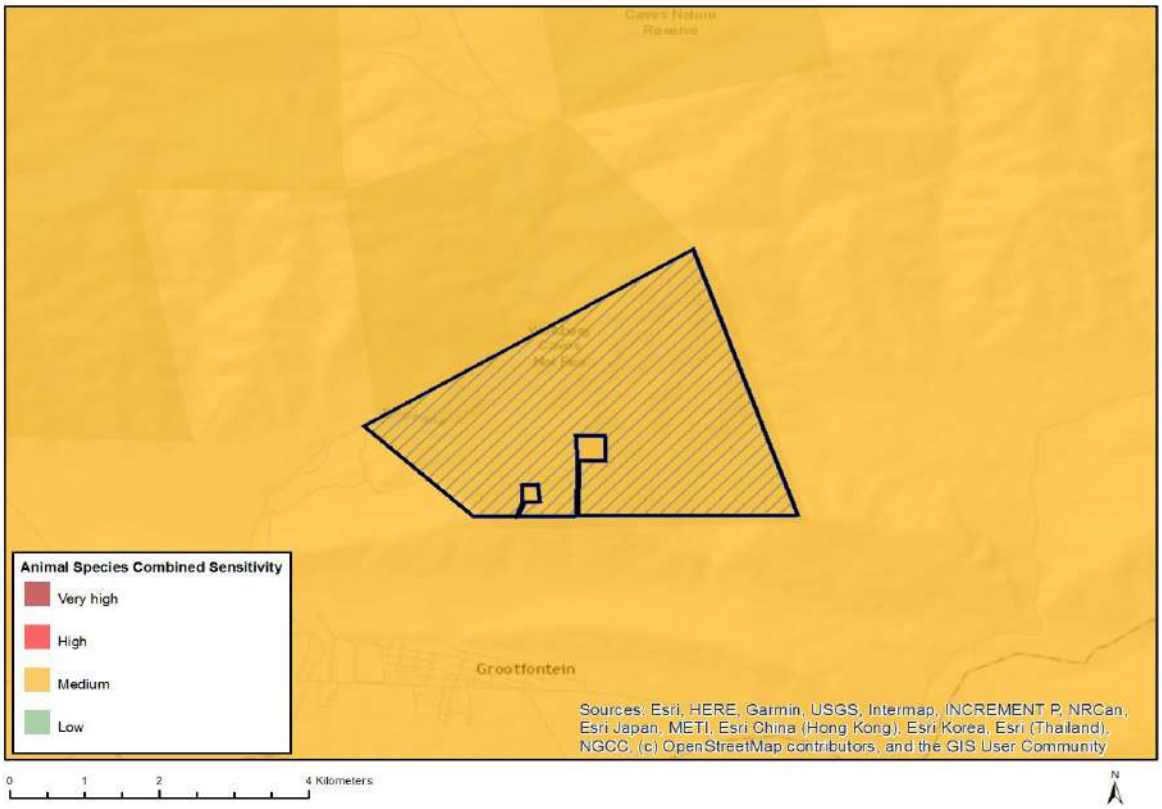


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY

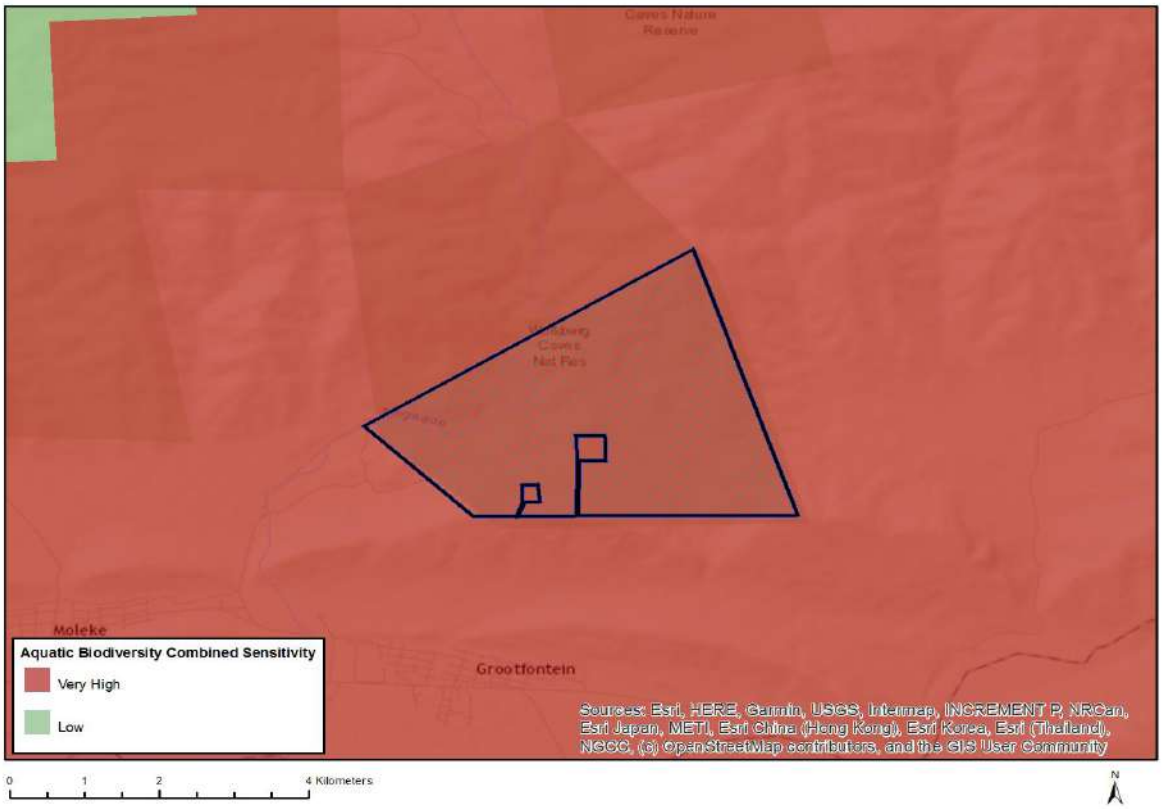


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Mammalia-Cercopithecus albogularis schwarzi
Medium	Sensitive species 4
Medium	Insecta-Aloeides stevensoni
Medium	Insecta-Orachrysops regalis
Medium	Insecta-Pseudonympha swanepoeli
Medium	Sensitive species 13
Medium	Sensitive species 9
Medium	Insecta-Dingana clara

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

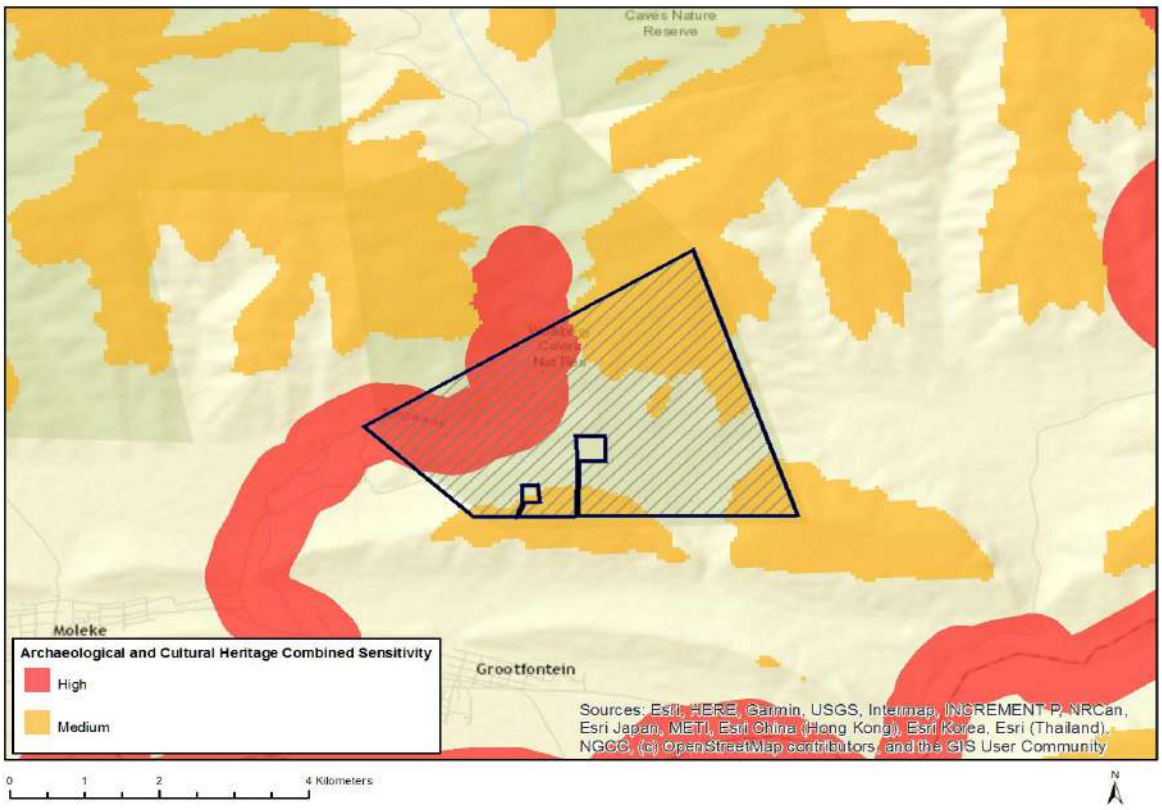


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Strategic water source area
Very High	River,Tongwane ,B3738Strategic water source area

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

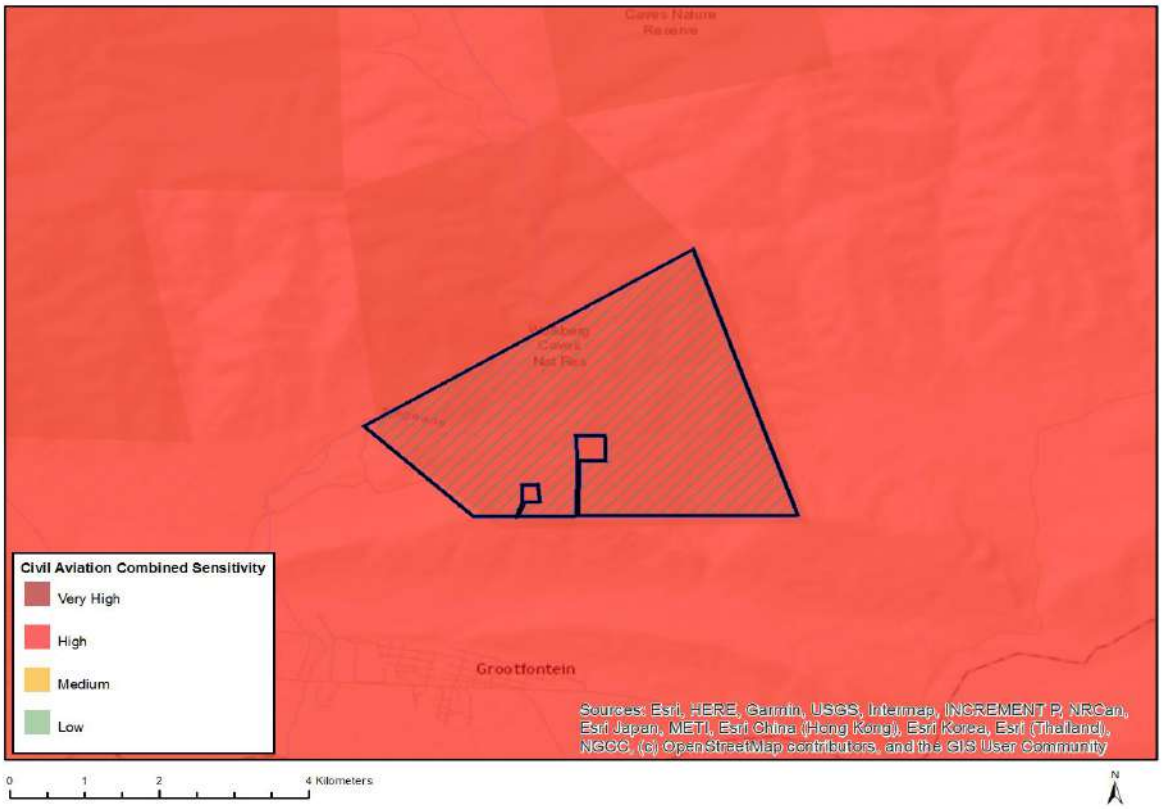


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 500 m of an important river
Medium	Mountain or ridge

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

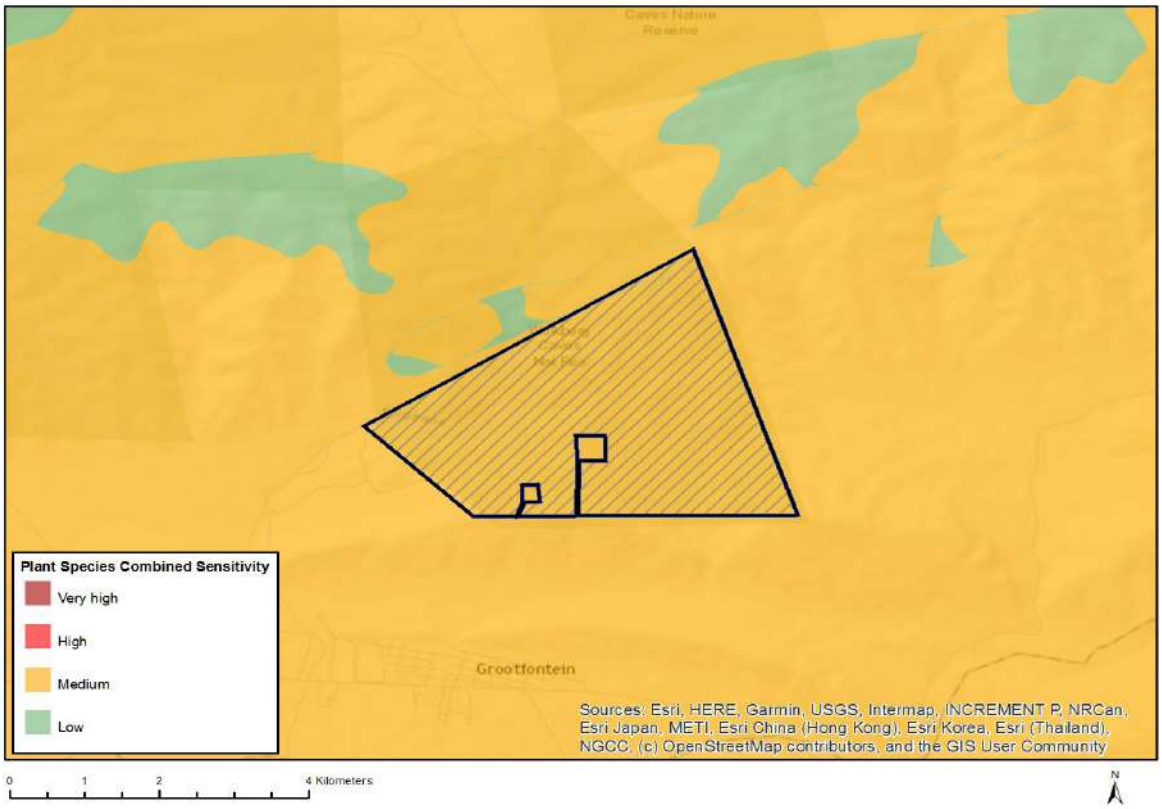


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Dangerous and restricted airspace as demarcated
Medium	Between 8 and 15 km of other civil aviation aerodrome

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

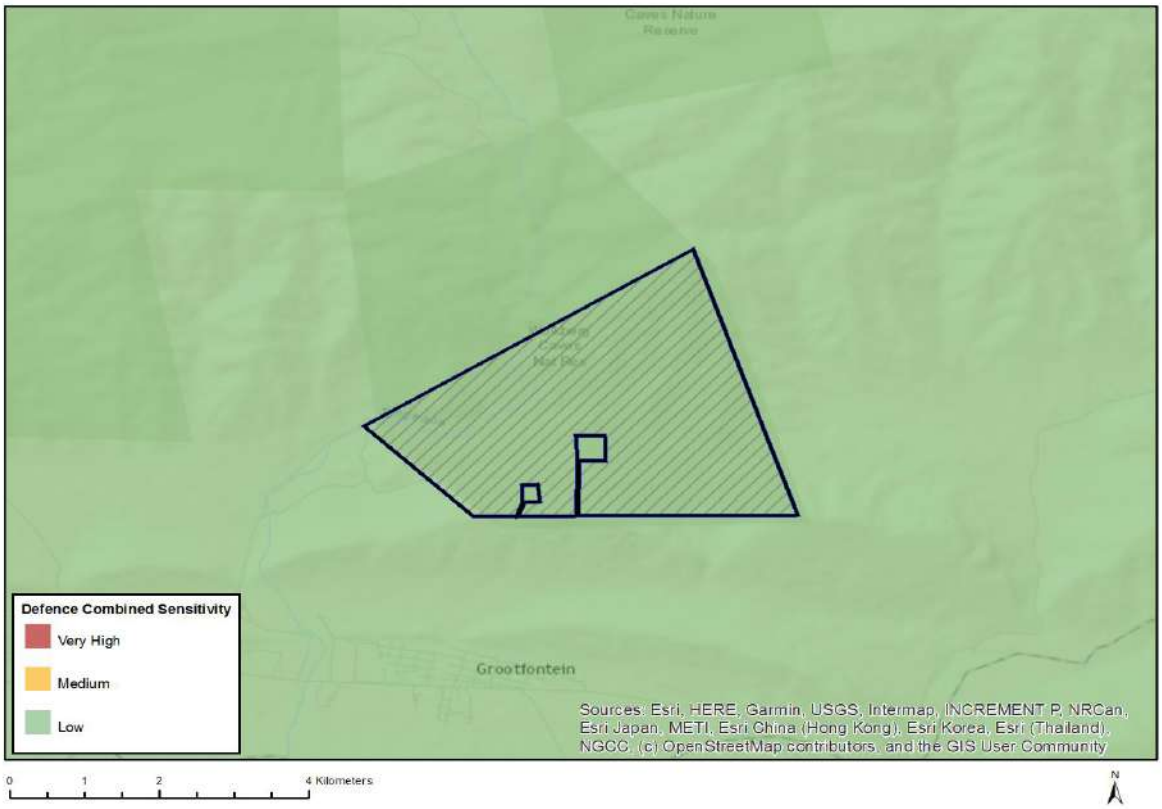


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Sensitive species 461
Medium	Sensitive species 275
Medium	Polygala sekhukhuniensis
Medium	Barleria dolomiticola
Medium	Asparagus sekukuniensis
Medium	Sensitive species 323

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

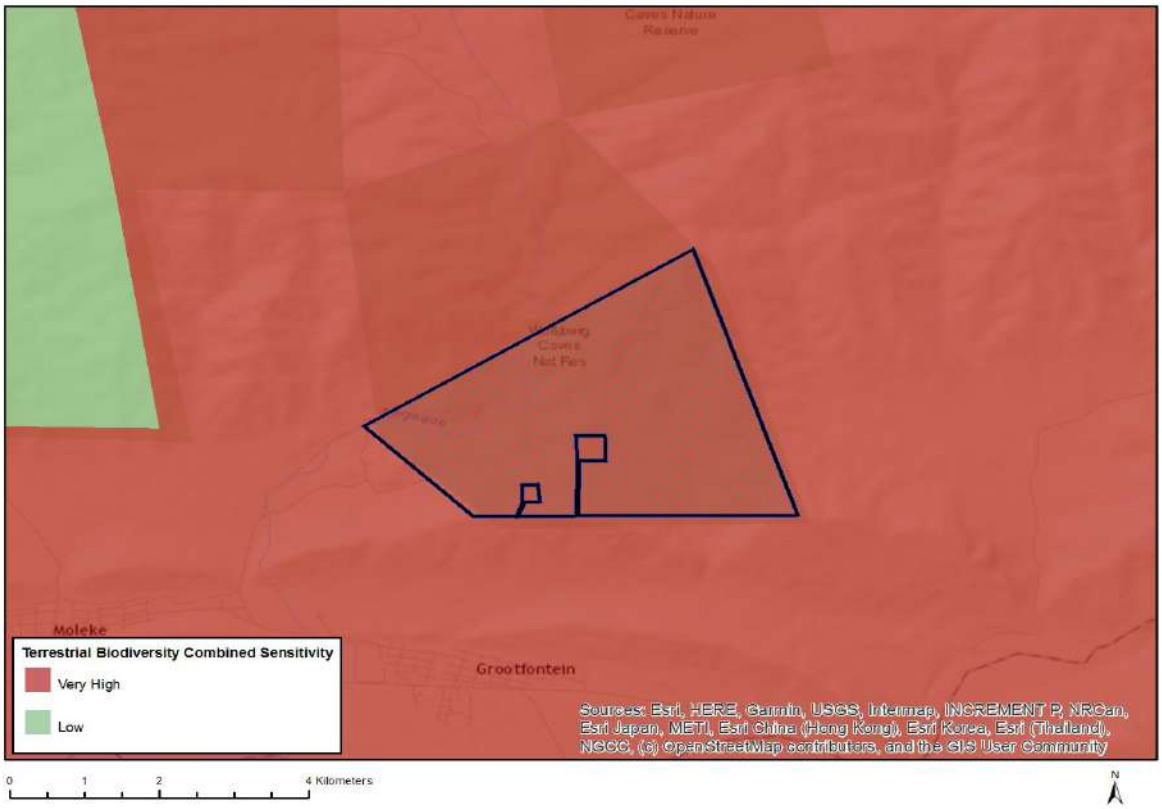


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Critical Biodiversity Area 1
Very High	Ecological Support Area 2
Very High	Focus Areas for land-based protected areas expansion