SCOPING REPORT FOR IRON ORE, CHROME, PGMS, SILVER, NICKEL, VANADIUM AND RARE EARTH METALS MINING RIGHT APPLICATION, INTEGRATED WATER USE LICENSE APPLICATION, INTERGRATED ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL AUTHORISATION ON PORTIONS 5 AND 9 (SUBDIVIDED TO THE REMAINING EXTENT, PORTIONS 5, 12 AND 18) OF THE FARM OSHOEK 212 IT AND PORTION 1 OF THE FARM OSHOEK-CLINIC 549 IT, SITUATED IN THE MAGISTERIAL DISTRICT OF CAROLINA, MPUMALANGA PROVINCE.

APPLICANT:

KUTHOBEKA (PTY) LTD

26 Kreya, Constentia Kloof, Victoria street, Roodepoort

COMPETENT AUTHORITY:

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Saveways Centre, First Floor, Mandela Drive, eMalahleni 1039

DMRE REF: MP 30 / 5 / 1 / 2 / 2 / 10262 MR

ENVIRONMENTAL ASSESSMENT PRACTITIONER:

Singo Consulting (Pty) Ltd

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

DARFT **2020**

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH A MINING RIGHT

SUBMITTED FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) & INTEGRATED WATER USE LISENCE IN TERMS OF NATIONAL WATER ACT (1998) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY AN APPLICATION IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 OF 2002) (AS AMENDED)

NAME OF APPLICANT:	**Kuthobeka (Pty) Ltd**
TEL NO:	+27 71 723 6049
FAX:	+27 86 517 4980
POSTAL ADDRESS:	P O BOX 8042, Roodepoort, Westgate, Gauteng
PHYSICAL ADDRESS:	26 Kreya,Constentia Kloof, Victoria street, Roodepoort
FILE REFERENCE NUMBER (SAMRAD)	MP 30 / 5 / 1 / 2 / 2 / 10262 MR

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

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

It is therefore an instruction that the prescribed reports required in terms of applications for an environmental authorization for listed activities triggered by an application for a right or permit are submitted in the exact format 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 Authorization being refused.

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

OBJECTIVES OF THE SCOPING PROCESS

The objective of the scoping process is to, through a consultative process –

(a) Identify the relevant polices and legislation relevant to the activity;

(b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) Identify and confirm the preferred activity and technology alternatives through an impact and risk assessment and ranking process;

(d) Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;

(e) Identify the key issues to be addressed in the assessment phase;

(f) Agree on the key issues addressed in the assessment phase; including the methodology to be applied, the expertise required as well as the extend of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and

(g) Identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Background

Kuthobeka (Pty) Ltd (the applicant) has appointed Singo Consulting (Pty) Ltd to undertake an environmental impact assessment and environmental authorization processes for the proposed Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals operation on portions 5 and 9 (Subdivided to the remaining extent, portions 5, 12 and 18) of the farm Oshoek 212 IT and portion 1 of the farm Oshoek-Clinic 549 IT, situated in the magisterial district of Carolina, Mpumalanga province.

The extent of the mining right entails a life of mine of more than 30 years and covers the above-mentioned farm portions. The proposed project relates to extraction of Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals through opencast and underground mining which entails life of mine of over thirty years. When mineral seams are near the surface, it is economical to extract them using open cast (also referred to as open cut, open pit, or strip) mining method. Opencast mining recovers a greater proportion of the proposed mineral deposits than underground methods. However, the mining method is normally determined by the depth of the mineral occurrences.

In order for the proposed mine to operate, the applicant is required to submit an application for a mining right with the Department of Mineral Resources and Energy (DMRE). In support of the application to obtain the mining right, the applicant is required to conduct a Scoping and Environmental Impact Assessment (S&EIA) process that need to be submitted to the DMRE for adjudication, which includes activities triggered under the Environmental Impact Assessment Regulations of 2014 (as amended, April 2017) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998) and activities triggered under the National Environmental Management: Waste Act, 2008 (NEM:WA) (Act 59 of 2008).

Scoping and Environmental Impact Assessment (S&EIA) Process

S&EIA are conducted in two phases. The first phase is scoping, and the second phase is the EIA/EMPr report compilation. The scoping phase commenced once the application was submitted to the competent authority and the following tasks were undertaken: identifying of interested and affected parties (I&APs) and stakeholders, identifying relevant policies and legislation; considering the need and desirability of the project; consider alternative technologies and sites; identify the potential environmental issues; determine the level of assessment and public participation process required for the EIA phase; and identify preliminary measures to avoid, mitigate or manage potential impacts. The objectives of the EIA phase were to assess the potential impacts associated with the preferred project alternatives as per the terms of reference for the assessment that are set out in the scoping report. The EIA/EMPr report will document the assessment findings and will detail the measures required to avoid, mitigate and/or manage the potential impacts.

The requirements for the S & EIA process are specifically contained in Chapter 4(3) of the NEMA Reg No 326 (amended on 7 April 2017). The EIA process can take up to 300 days to complete (87 days for scoping phase, 106 days for EIA phase, and 107 days for competent authority to review).

LIST OF ABBREVIATIONS

ASAPA: Association of Southern African Professional Archaeologists	**BID:** Background Information Document
DEA: Department of Environmental Affairs	**DMRE**: Department of Mineral Resources and Energy
DWS: Department of Water and Sanitation	**EA:** Environmental Authorization
EIA: Environmental Impact Assessment	**EIAR:** Environmental Impact Assessment Report
EMPr: Environmental Management Programme report	**MDARD:** Mpumalanga Department of Agriculture and Rural Development
GIS: Geographic Information System	**GN**: Government Notice
HIA: Heritage Impact Assessment	**I&AP**: Interested & Affected Party
IBA: Important Bird Area	**IWULA**: Integrated Water Use License Application
LoM: Life of Mine	**MPRDA:** Minerals and Petroleum Resources Development Act, 2002
Mtpa: Million tons per annum	**NEM: WA:** National Environmental Management: Waste Amendment Act, 2008
NEMA: National Environmental Management Act, 1998 (Act No. 107 of 1998)	**NHRA:** National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA: National Water Act, 1998 (Act No. 36 of 1998)	**PPP:** Public Participation Process
RoM: Run of Mine	**SAHRA**: South African Heritage Resources Agency
SANS: South African National Standard	**SCC:** Species of Conservation Concern
S&EIA: Scoping and Environmental Impact Assessment	**WMA:** Water Management Area

Table of Contents

IMPORTANT NOTICE 2
OBJECTIVES OF THE SCOPING PROCESS 2
EXECUTIVE SUMMARY 4
LIST OF ABBREVIATIONS 6
1. INTRODUCTION AND BACKGROUND 10
1.1 Scoping Phase 11
1.2 EIA Phase Process 11
2 APPLICANT AND ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) DETAILS 13
2.1 Details of the Applicant 13
2.2 Details of the EAP 13
2.2.1 Expertise of Environmental Assessment Practitioner 14
2.2.2 Specialist Studies 15
2.3 Property Description 15
2.4 Locality Map 15
2.4.1 Landowners 17
2.4.2 Description of Current Land Cover 18
3 POLICY AND LEGISLATIVE CONTEXT 19
3.1Constitution of the Republic of South Africa, Act 108 Of 1996 As Amended 20
3.2 Mineral and Petroleum Resources Development Act 20
3.3 National Environmental Management Act 20
3.4 National Water Act 21
3.5 National Environmental Management: Air Quality Act 23
3.6 The National Heritage Resources Act 24
3.7 National Environmental Management: Biodiversity Act 25
3.8 The Conservation of Agricultural Resources Act 26
3.10 Environment Conservation Act, 1989 (Act 73 Of 1989) – Noise Control Regulations 27
3.11 Noise Standards 28

4 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY 28
4.1 Mining Operations 28
4.2 Mining Methodology 29
4.3 INFRASTRUCTURE REQUIREMENTS 31
4.4 LISTED AND SPECIFIED ACTIVITIES 32
5 NEED AND DESIRABILITY OF PROPOSED ACTIVITIES 38
5.1 Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals as an Important Resource 38
5.2 Justification of Kuthobeka (Pty) Ltd Proposed Opencast Mining Operations 38
5.3 Period for which Environmental Authorization is Required 39
6 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE 39
6.1 Location Alternatives 40
6.2 Land Use Alternatives 41
6.3 PROCESS ALTERNATIVES 41
6.3.1 Mining Method 41
6.4 NO-GO ALTERNATIVE 41
7 PUBLIC PARTICIPATION PROCESS (PPP) 42
7.1 Objectives of Public Participation 42
7.2 Legislation 43
7.3 Details of the Public Participation Process Followed 43

List of Figures

Figure 1: Mpumalanga Province district municipalities and their respective local municipalities. 16
Figure 2: Typical illustration of an Underground and Surface Mining. 31
Figure 3: Shows a typical illustration of a Public Participation Process. 43
Figure 4: The population of Albert Luthuli municipality (Stats SA Census 2001 and 2011). 61
Figure 5: Highest educational attainment for persons 20+ (Stats SA Census 1996, 2001, 2011). 62
Figure 6: Department of Finance: Socio Economic Status 2013. 63

List of Tables

Table 1: Applicant's contact details 13
Table 2: Singo Consulting contact details 13
Table 3: Property description of the proposed Kuthobeka (Pty) Ltd Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals Mine. 15
Table 4: Listed activities according to NEMA requiring environmental authorization 32
Table 5: Red data species potentially occurring in the project area according to the environmental screening tool database. 55
Table 6: Unemployment rate according to Stats SA census 1996, 2001, 2011. 62
Table 7: Status of Impacts 64
Table 8: Spatial scale of Impacts 64
Table 9: Temporal scale of Impacts 64
Table 10: Probability of Impacts 65
Table 11: Severity of Impacts 65
Table 12: Significance of Impacts 65
Table 13: Perceived Significance of Impacts 66
Table 14: Potential Impacts prior to mitigation measures 68

1. INTRODUCTION AND BACKGROUND

Kuthobeka (Pty) Ltd (the applicant) has appointed Singo Consulting (Pty) Ltd to undertake an environmental impact assessment and environmental authorization processes for the proposed Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals mine on portions 5 and 9 (Subdivided to the remaining extent, portions 5, 12 and 18) of the farm Oshoek 212 IT and portion 1 of the farm Oshoek-Clinic 549 IT, situated in the magisterial district of Carolina, Mpumalanga province.

The extent of the mining right entails a life of mine of more than 30 years and covers the above-mentioned farms and portions. The proposed project relates to the underground and opencast mining extraction in the bushveld complex. The minerals sought-after include Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth materials. The proposed mining method is dependent on the type and depth of the minerals. It is economical to extract minerals occurring at shallow depths using open cast (also referred to as open cut, open pit, or strip) mining method.

For the proposed mine to operate, the applicant is required to apply for a mining right with the Department of Mineral Resources and Energy (DMRE). In support of the application to obtain the mining right, the applicant is required to conduct a Scoping and Environmental Impact Assessment (S&EIA) process that need to be submitted to the DMRE for adjudication, which includes activities triggered under the Environmental Impact Assessment Regulations of 2014 (as amended, April 2017) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998) and activities triggered under the National Water Act, 1998.

The proposed opencast and underground Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals mining operation constitutes various listed activities which have been listed within the scheduled activities in Government Notice Regulation No 324, 325 and 327 (amended 7 April 2017) and therefore require a full Scoping and EIA process to be followed. Prior to any listed activity being approved by the DMRE, it is required that an environmental process is undertaken, and a report is submitted to the relevant environmental authority for consideration.

The purpose of the S&EIA process is to ensure that potential environmental, economic and social impacts associated with operation and closure/ rehabilitation of a project are identified, assessed and appropriately managed. There are two primary phases, namely the scoping phase and the impact assessment phase.

These two phases are discussed in more details below:

1.1 Scoping Phase

The scoping phase is conducted as the precursor to the Environmental Impact Assessment (EIA) process during which:

- Project and baseline environmental information is collated. Baseline information for the scoping report is gathered through visual inspections during field visits of the proposed project area and surroundings, desktop studies which include GIS mapping, and review of existing reports, guidelines and legislation.
- Landowners, adjacent landowners, local authorities, environmental authorities, as well as other stakeholders which may be affected by the project, or that may have an interest in the environmental impacts of the project are identified.
- Interested and affected parties (I&APs) are informed about the proposed project.
- Environmental authorities are consulted to confirm legal and administrative requirements.
- Environmental issues and impacts are identified and described.
- Development alternatives are identified and evaluated, and non-feasible development alternatives are eliminated.
- The nature and extent for further investigations and specialist input required in the EIA phase is identified.
- The draft and final scoping reports are submitted for review by authorities, relevant organs of state and I&APs.
- Key I&AP issues and concerns are collated into an issues and response report for consideration in the EIA phase.

1.2 EIA Phase Process

After the initial scoping phase, the EIA phase of the application includes:

- Specialist investigations are undertaken in accordance with the terms of reference established in the scoping assessment (plan of study for EIA appended to the scoping report). The scope for specialist work is determined accordingly to the nature and scale of the project impacts.
- An evaluation of development alternatives and identification of a proposed option.

- An assessment of existing impacts (no-go development option), environmental impacts that may be associated with the proposed project option, and cumulative impacts using the impact assessment methodology.
- Identification of mitigation measures to address the environmental impacts and development of actions required to achieve the mitigation required.
- Consultation with I&APs.
- Incorporation of public comment received during scoping and the draft EIA into the final EIA report.
- Issuing of the final EIA report for review.
- After the draft EIA report was reviewed, comments received are incorporated in the final EIA report and final Environmental Management Program (EMPr).

The requirements for the S&EIA process are specifically contained in Chapter 4(3) of the NEMA Reg No 326 (amended on 7 April 2017). The EIA process can take up to 300 days to complete (87 days for scoping phase, 106 days for EIA phase, and 107 days for competent authority to review).

2 APPLICANT AND ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) DETAILS

2.1 Details of the Applicant

For purposes of this project, the following person may be contacted:

Table 1: Applicant's contact details

Contact Person	Sphiwe J. Chishti
Cellular no.	+27 71 723 6049
Fax	+27 86 517 4980
E-mail Address	jchsti1@absamail.co.za
Physical Address	26 Kreya, Constentia, Kloof, Victoria street, Roodepoort

2.2 Details of the EAP

Kuthobeka (Pty) Ltd has appointed Singo Consulting (Pty) Ltd as an independent Environmental Assessment Practitioner (EAP) to undertake a Scoping and Environmental Impact Assessment (S&EIA) process that is required to support the application for a mining right.

Singo Consulting (Pty) Ltd has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations. For purposes of this S&EIA, the following person may be contacted at Singo Consulting (Pty) Ltd:

Table 2: Singo Consulting contact details

Name (s)	**Dr Kenneth Ndinnanyi Singo (Principal Consultant)** **Siyabonga Mashigo (Junior Consultant)**
Tel no	+27 13 692 0041
Fax no	+27 86 5144 103
Cellular no	+27 79 177 8410 +27 72 081 6682
E-mail address	admin@singoconsulting.co.za kenneth@singoconsulting.co.za siyabonga@singoconsulting.co.za
Address	Office No. 16 First Floor, Corridor Hill Crossing, 09 Langa Crescent, Corridor Hill, eMalahleni,1039. P/Bag X7297, Postnet Suit 87, Highveld mall, Witbank 1035

2.2.1 Expertise of Environmental Assessment Practitioner

Singo Consulting (Pty) Ltd is a growing organization in the field of geological sciences, environmental sciences and environmental management. This organization has provided sound practicable solutions to unavoidable environmental problems, particularly those triggered by human activities. This is achieved by tackling environmental problems using various fields of applied science, such as chemistry, hydrology, environmental geology, geochemistry, geophysics, and soil sciences. This leads to proper and sound environmental impact assessments and the production of enforceable environmental management plans. This organization has conducted over 26 successful Environmental Impact Assessments (EIAs) in various provinces of South Africa, basic assessment reports and environmental management plans (EMPs) which protect and promote the sustainable utilization of environment. See the detailed CV of the EAP on the appendices.

Qualifications of the EAPs (with evidence)

Education

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

Summary of the EAP's experience

Kenneth Ndinnanyi Singo (Principal Consultant) worked for Malatleng Mining CC as Geologist Consultant and Environmental Analyst. In search for growth, he joined Ncondezi Coal Company in Mozambique, Tete Coal basin as Leading Project Geologist. He worked for Anglo American Thermal Coal as a Senior Project Geologist. He is the Managing Director and Principal Consultant for Singo Consulting (Pty) Ltd.

- **National Diploma: Environmental Sciences (TUT)**

Summary of the EAP's experience (In carrying out EIAs)

Siyabonga Mashigo (Junior Consultant) has 2 years' experience in the environmental management field as an environmental scientist. He gained this experience after joining Singo Consulting (Pty) Ltd through Work Integrated Learning program. He has conducted several basic assessment projects for Singo Consulting. His expertise includes establishment of dust fallout monitoring networks for open cast mines as well as environmental performance and auditing.

2.2.2 Specialist Studies

Specialist studies will be undertaken to address the key issues that require further investigation. The specialist studies involve the gathering of data relevant to identifying and assessing impacts that may occur because of the proposed project. The specialists also recommend appropriate mitigation / control or optimization measures to minimize potential negative impacts or enhance potential benefits, respectively. Specialists will be appointed, and the relevant specialist assessments will be made available during the EIA phase.

2.3 Property Description

Property description details for the proposed Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals mine are provided in Table 3 below. All farm names and portions applicable to this S&EIA are listed below.

Table 3: Property description of the proposed Kuthobeka (Pty) Ltd Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals Mine.

Farm Name (s):	Portions 5 and 9 (Subdivided to the remaining extent, portions 5, 12 and 18) of the farm Oshoek 212 IT and portion 1 of the farm Oshoek-Clinic 549 IT
Application area (ha):	1435.0233 ha
Magisterial district:	Carolina
Distance and Direction from nearest town:	The application area is situated approximately 2km north of Hartbeeskop and 70km south of Barberton Town.
21-Digit Surveyor General Code for each Farm portion:	T0IT00000000021200005 T0IT00000000021200009 T0IT00000000054900001

2.4 Locality Map

The project area for this Mining Right application falls in the Gert Sibande District Municipality, Mpumalanga Province. The project area is situated under the town of Carolina under the Albert Luthuli Local Municipality. Carolina is a town situated on Johannesburg to Swaziland route (R 33 and R 38) in the Mpumalanga province.

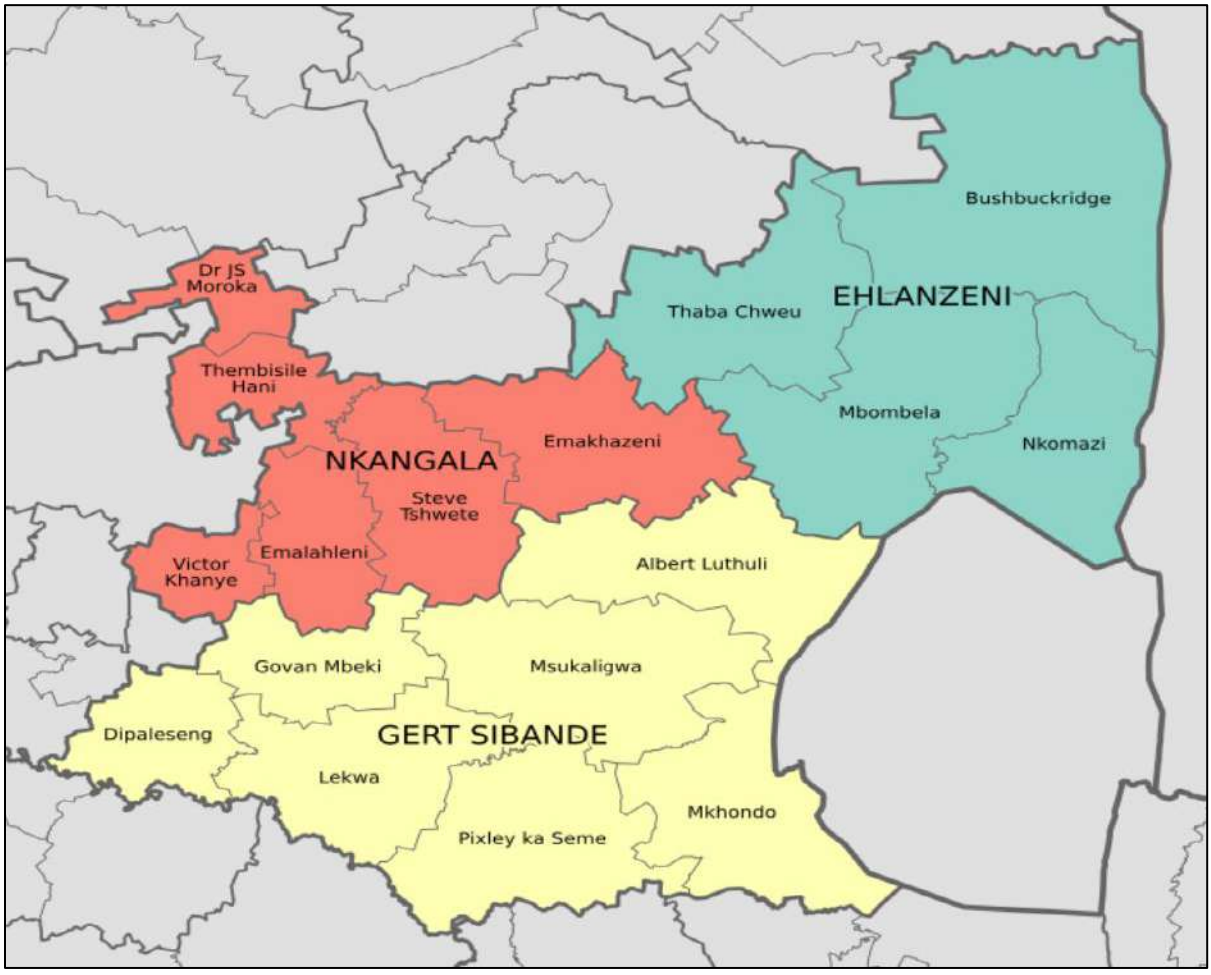


Figure 1: Mpumalanga Province district municipalities and their respective local municipalities.

Figure 2 below depicts the actual location of the proposed mining area. The project area is located approximately 20.34 km North-West of Mbabane and the N17 is crossing on the northern boundary of the project area. As shown in the figure below, the project is located on the borderline to Swaziland (Oshoek Boarder Post).

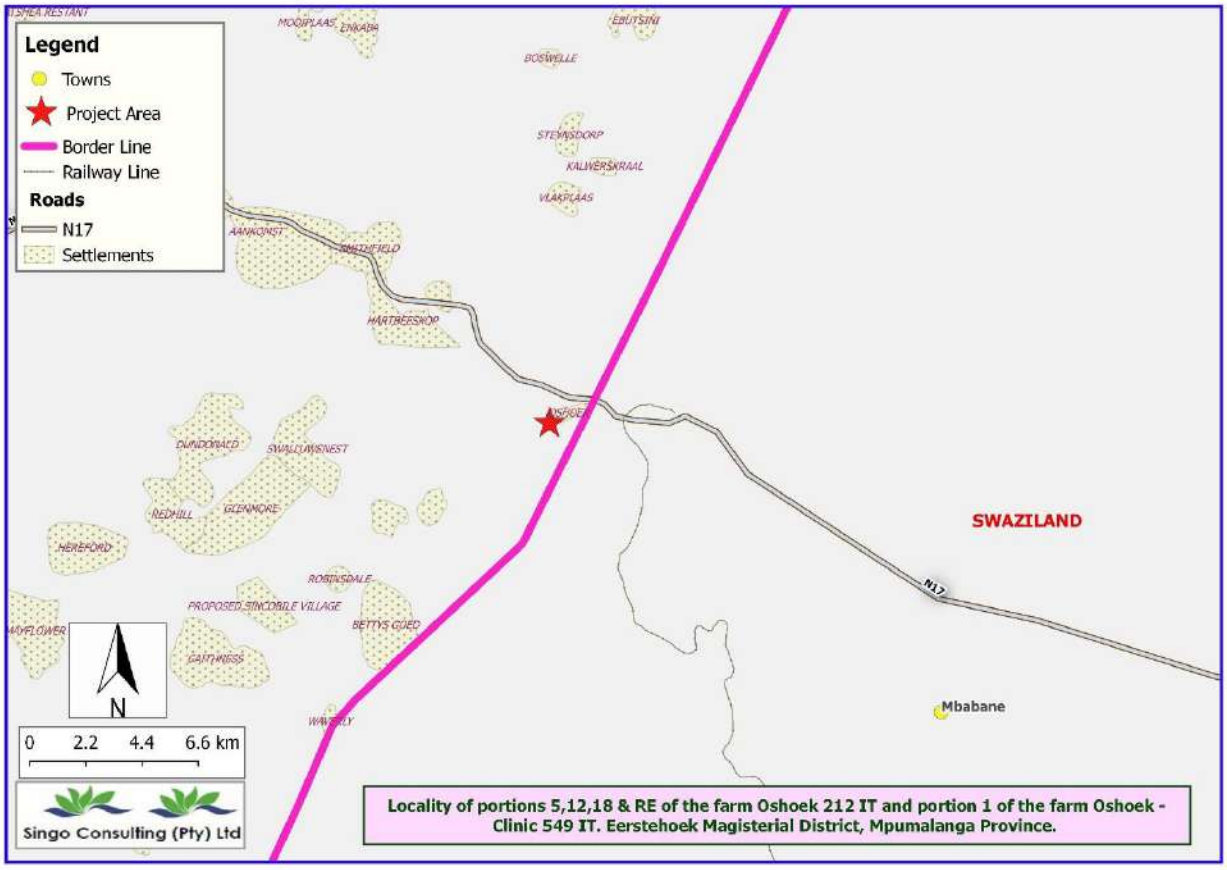
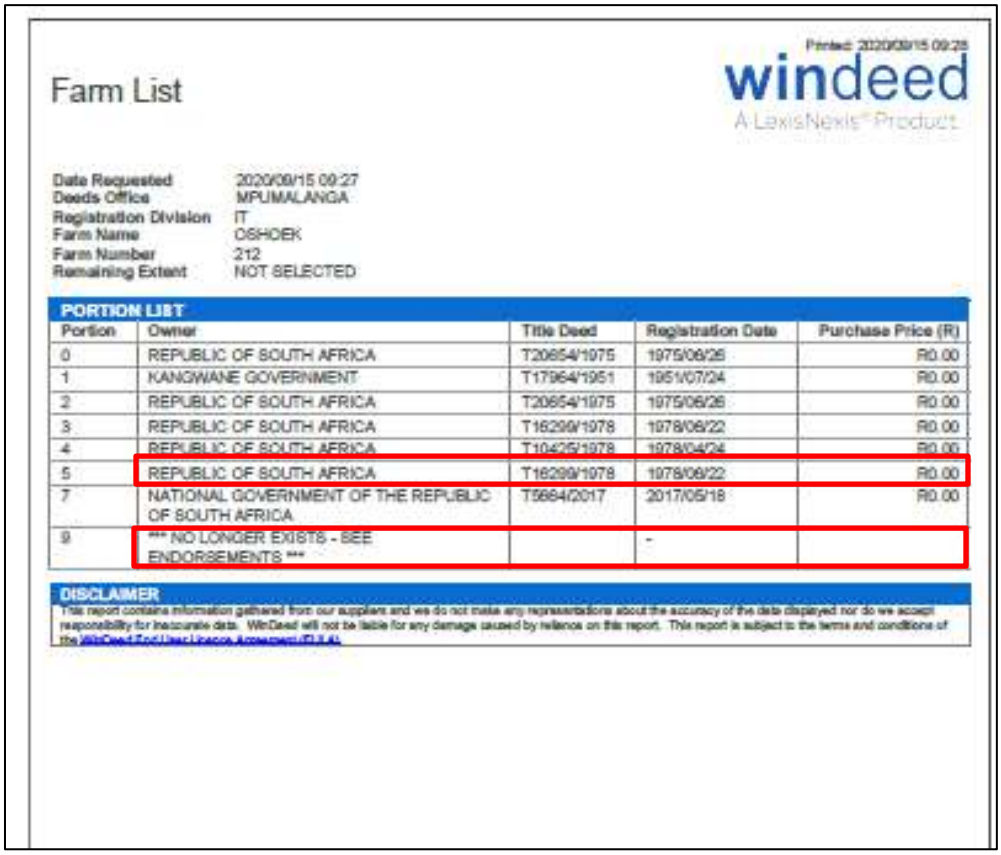


Figure 2: Shows the locality map of the project area.

2.4.1 Landowners

The mining right is applicable for all the above-mentioned properties. The attached figure below shows identified landowners using Windeed Search. The search shows all the title deeds of the owners in the proposed farms, however for this application it must be noted that some of the portions discovered via Deed Search are excluded from the proposed activity only the above-mentioned portions will be affected. As observed on the Windeed results below, the proposed properties belong to the government however, lawful occupiers will be afforded a fair opportunity to raise comments regarding the proposed project.



Farm List

windeed
A LexisNexis® Product

Date Requested	2020/09/15 09:27
Deeds Office	MPUMALANGA
Registration Division	IT
Farm Name	OSHOEK
Farm Number	212
Remaining Extent	NOT SELECTED

PORTION LIST

Portion	Owner	Title Deed	Registration Date	Purchase Price (R)
0	REPUBLIC OF SOUTH AFRICA	T20654/1975	1975/06/26	R0.00
1	KANGWANE GOVERNMENT	T17964/1951	1951/07/24	R0.00
2	REPUBLIC OF SOUTH AFRICA	T20654/1975	1975/06/26	R0.00
3	REPUBLIC OF SOUTH AFRICA	T16299/1978	1978/09/22	R0.00
4	REPUBLIC OF SOUTH AFRICA	T10425/1978	1978/04/24	R0.00
5	REPUBLIC OF SOUTH AFRICA	T16299/1978	1978/09/22	R0.00
7	NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA	T5664/2017	2017/05/18	R0.00
9	*** NO LONGER EXISTS - SEE ENDORSEMENTS ***		-	

DISCLAIMER

This report contains information gathered from our suppliers and we do not make any representations about the accuracy of the data displayed nor do we accept responsibility for inaccurate data. WinDeed will not be liable for any damage caused by reliance on this report. This report is subject to the terms and conditions of the

Figure 3: Shows the Windeed results for the area of interest.

2.4.2 Description of Current Land Cover

Land cover information is crucial, it informs a wide variety of activities ranging from environmental planning and protection, development planning, economic development, compliance monitoring, enforcement and strategic decision making.

The proposed area as depicted in the figure below is densely populated by various land uses this include:

- Cultivated lands
- Plantations
- Built-up areas
- Waterbodies
- Natural areas

During the EIA Phase it is recommended to conduct a detailed study on all the waterbodies occurring around the site.

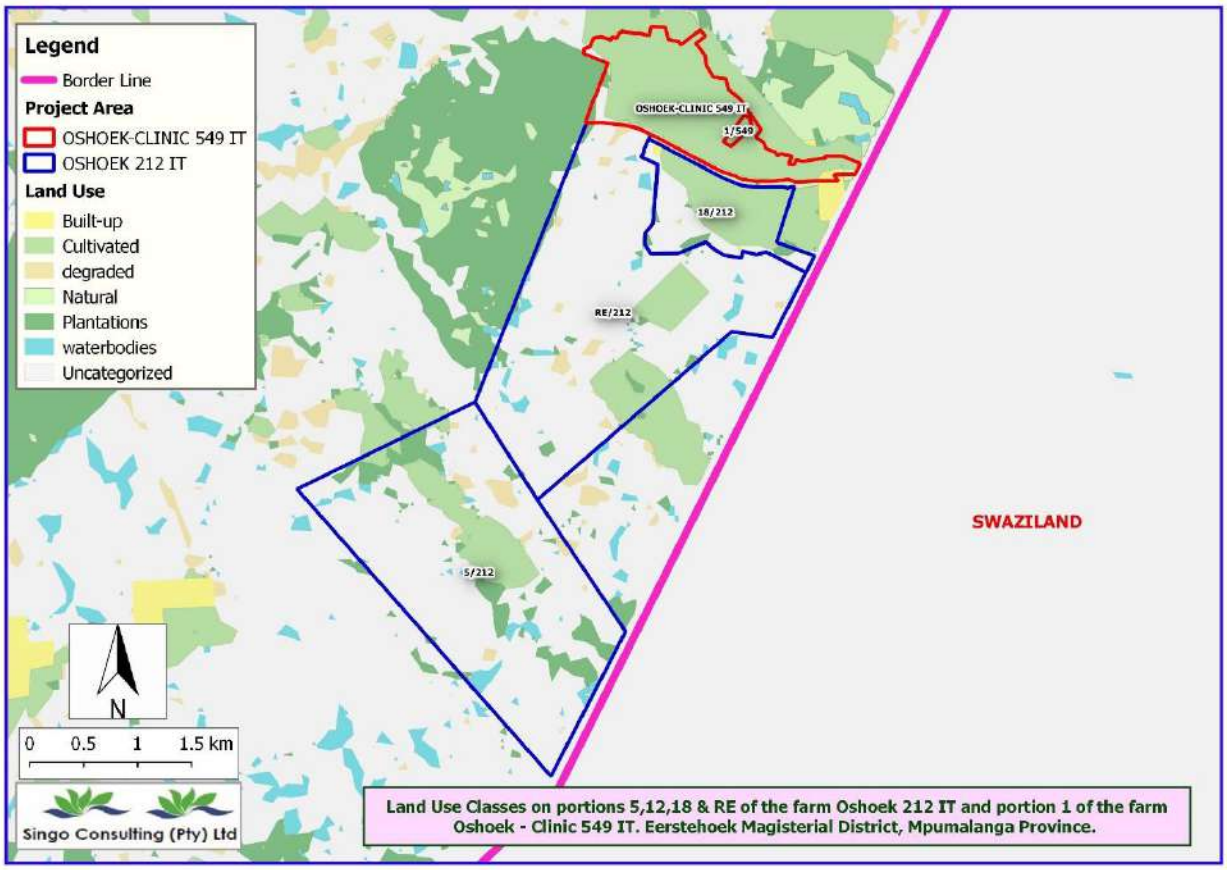


Figure 4: Shows the land uses around the proposed area.

2.4.3 Land Claims

A land claim enquiry has been lodged to find out whether are there any possible land claims in process on the proposed farms and portions. Should there be any land claims in progress, further consultation will be undertaken.

3 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation identified which may relate to the proposed project.

3.1 Constitution of the Republic of South Africa, Act 108 Of 1996 As Amended

Section 24 states:

"Everyone has the right—

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

3.2 Mineral and Petroleum Resources Development Act

The Mineral and Petroleum Resources Development Act, 2002 (MPRDA), outlines the procedural requirements an applicant must follow to get a mining right who wishes to proceed with a mining project, part of which requires the applicant to obtain Environmental Authorization (EA) in terms of the National Environmental Management Act (1998, as amended). The MPRDA is administered by the Department of Mineral Resources and Energy (DMRE) and governs the sustainable utilization of South Africa's mineral resources.

The MPRDA aims to "make provision for equitable access to, and sustainable development of, the nation's mineral and petroleum resources". If the proposed activities require material (e.g. sand, gravel, aggregate) for the purposes of construction then the provisions of the MPRDA may apply.

In support of the application to obtain the mining right, the applicant is required to conduct a Scoping Report, EIA /EMPr and I&AP consultation process that need to be submitted to the DMR for adjudication.

3.3 National Environmental Management Act

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA regulations, the applicant is required to appoint an environmental assessment practitioner (EAP) to undertake the EIA, as well as conduct the public participation process. In South Africa, EIA became a legal requirement in 1997 with the

promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant environmental authorization. On 21 April 2006 the Minister of Environmental Affairs and Tourism promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended in June 2010 and again in December 2014. The December 2014 NEMA regulations are applicable to this project. Mining Activities officially became governable under the NEMA EIA in December 2014.

The objective of the Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorized, and that activities which are authorized are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

In accordance with the provisions of Sections 24 (5) and Section 44 of the NEMA the Minister has published Regulations (GNR. 982) pertaining to the required process for conducting EIA's to apply for, and be considered for, the issuing of an Environmental Authorization (EA). These Regulations provide a detailed description of the EIA process to be followed when applying for EA for any listed activity. The Regulations differentiate between a simpler Basic Assessment Process (required for activities listed in GN R. 983 and 985) and a more complete EIA process (activities listed in GN R. 984). In the case of this project there are activities triggered under GN R. 984 and as such a full EIA process is necessary. On 7 April 2017, the NEMA 2014 regulations were amended, and accordingly the activities triggered under GN R. 324, 325 and 327 are applicable to this application.

A Scoping and EIA process is reserved for activities which have the potential to result in significant impacts which are complex to assess. Scoping and EIA accordingly provides a mechanism for the comprehensive assessment of activities that are likely to have more significant environmental impacts.

3.4 National Water Act

The National Water Act, 1998 (NWA) also has a role to play in regulating mining. Mining almost always uses water and/or has an impact on a water resource such as a stream, wetland or river. The NWA is administered by the Department of Water and Sanitation (DWS).
The NWA section 21 defines eleven water uses that require an authorization:

21 (a): taking water from a water resource;

21 (b): storing water;

21 (c): impeding or diverting the flow of water in a watercourse;

21 (d): engaging in a stream flow reduction activity contemplated in section 36;

21 (e): engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

21 (f): discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;

21 (g): disposing of waste in a manner which may detrimentally impact on a water resource;

21 (h): disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;

21 (i): altering the bed, banks, course or characteristics of a watercourse;

21 (j): removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

21 (k): using water for recreational purposes.

The proposed mine is in the process of applying for an Integrated Water Use Licence (IWUL) as per the water uses indicated in **Table 5**.

3.5 National Environmental Management: Air Quality Act

The National Environmental Management: Air Quality Act (NEM: AQA) (Act No. 39 of 2004 as amended) is the main legislative tool for the management of air pollution and related activities. The Object of the Act is:

- to protect the environment by providing reasonable measures for-
- the protection and enhancement of the quality of air in the republic;
- the prevention of air pollution and ecological degradation; and
- securing ecologically sustainable development while promoting justifiable economic and social development; and
- Generally, to give effect to Section 24(b) of the constitution to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and wellbeing of people.

The NEM: AQA mandates the Minister of Environmental Affairs to publish a list of activities which result in atmospheric emissions and consequently cause significant detrimental effects on the environment, human health and social welfare. The Listed Activities and Minimum National Emission Standards were published on the 22nd November 2013 (Government Gazette No. 37054).

According to the Air Quality Act, air quality management control and enforcement is in the hands of local government with District and Metropolitan Municipalities as the licensing authorities. Provincial government is primarily responsible for ambient monitoring and ensuring municipalities fulfil their legal obligations, with national government primarily as policy maker and co- Ordinator. Each sphere of government must appoint an Air Quality Officer responsible for coordinating matters pertaining to air quality management. Given that air quality management under the old Act was the sole responsibility of national government, local authorities have in the past only been responsible for smoke and vehicle tailpipe emission control.

The National Pollution Prevention Plans Regulations which came into effect on 21 July 2017 and tie in with The National Greenhouse Gas Emission Reporting Regulations which took effect on 3 April 2017. In summary, the regulations aim to prescribe the requirements that pollution prevention plans of greenhouse gases declared as priority air pollutants need to comply with, in terms of the NEM: AQA. The regulations specify who needs to comply, and by when, as well as prescribing the content requirements. Mines do have an obligation to report on the GHG emissions under these regulations.

3.6 The National Heritage Resources Act

The National Heritage Resources Act (NHRA) (Act 25 of 1999) stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…" The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the NEMWA legislation.

In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage. The NEMA 23(2)(b) states that an integrated environmental management plan should, "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage".

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down.

The MPRDA defines 'environment' as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the National Heritage Resources Act that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities (Fourie, 2008b).

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional

Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Impact Assessment (HIA) is compiled.

3.7 National Environmental Management: Biodiversity Act

The overarching aim of the National Environmental Management: Biodiversity Act (No 10 of 2004) (NEMBA), within the framework of NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa, and of the components of such biological diversity;
- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

The South African National Biodiversity Institute (SANBI) was established on 1 September 2004 through the signing into force of the NEMBA, its purpose being (inter alia) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems.

Other objectives include the identification, control and eradication of declared weeds and alien invaders in South Africa. These are categorized according to one of the following categories, and require control or removal:

- Category 1a Listed Invasive Species: Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated;
- Category 1b Listed Invasive Species: Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled;
- Category 2 Listed Invasive Species: Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as

Other objectives include the identification, control and eradication of declared weeds and alien invaders in South Africa. These are categorized according to one of the following categories, and require control or removal:

- Category 1a Listed Invasive Species: Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated;
- Category 1b Listed Invasive Species: Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled;
- Category 2 Listed Invasive Species: Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be; and
- Category 3 Listed Invasive Species: Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.

The provisions of this Act have been considered and where relevant incorporated into the proposed mitigation measures and requirements of the EMPr.

It is also appropriate to undertake a Fauna and Flora Impact Assessment for developments in an area that is considered ecologically sensitive which require environmental authorization in terms of NEMA, with such Assessment taking place during the EIA phase.

3.8 The Conservation of Agricultural Resources Act

To provide for control over the utilization of the natural agricultural resources in South Africa to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

3.9 Spatial Planning and Land Use Management Act 16 OF 2013 (SPLUMA)

The Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) is a framework law, which means that the law provides broad principles for a set of provincial laws that will regulate planning for the country. The Act introduces provisions to cater for development principles; norms and standards; inter-governmental support; Spatial Development Frameworks (SDFs) across national, provincial, regional and municipal areas; Land Use Schemes (LUS); and municipal planning tribunals.

SPLUMA also provides clarity on how planning law interacts with other laws and policies. It is a uniform, recognizable and comprehensive system that addresses the past spatial and regulatory

imbalances and promotes optimal exploitation of minerals and mineral resources. SPLUMA achieves this by strengthening the position of mining right holders when land needs to be rezoned for mining purposes. SPLUMA's impact on optimal exploitation is particularly evident where conflict exists between mining right holders and landowners.

Economic and policy considerations, as well as practical necessities, often motivate the state to grant mining rights to entities other than landowners. SPLUMA is a new national framework Act that provides clear principles and standards for provincial and local governments to formulate their own new spatial planning and land use policies. The new provincial legislation can regulate, among other things, land development, land use management, spatial planning and municipal planning.

3.10 Environment Conservation Act, 1989 (Act 73 Of 1989) – Noise Control Regulations

In terms of section 25 of the ECA, the national Noise Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) were promulgated. The NCRs were revised under GN R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. The noise control regulations will need to be considered in relation to the potential noise that may be generated mainly during the construction and decommissioning phases of the proposed project. The two key aspects of the noise control regulations relate to disturbing noise and noise nuisance.

Section 4 of the regulations prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof. A disturbing noise is defined in the regulations as 'a noise level which exceeds the zone sound level or if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more.

Section 5 of the noise control regulations prohibits the creation of a noise nuisance. A noise nuisance is defined as 'any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person'. Noise nuisance is anticipated from the proposed project particularly to those residents that are situated near the project sites.

South African National Standard 10103 also applies to the measurement and consideration of environmental noise and should be considered in conjunction with these regulations. A noise specialist study is proposed for the EIA process.

3.11 Noise Standards

There are a few South African Bureau of Standards (SABS) relevant to noise from mines, industry and roads. They are:

- South African National Standard (SANS) 10103:2008. 'The measurement and rating of environmental noise with respect to annoyance and to speech communication';
- SANS 10210:2004. 'Calculating and predicting road traffic noise';
- SANS 10328:2008. 'Methods for environmental noise impact assessments'.
- SANS 10357:2004. 'The calculation of sound propagation by the Concave method';
- SANS 10181:2003. 'The Measurement of Noise Emitted by Road Vehicles when Stationary'; and
- SANS 10205:2003. 'The Measurement of Noise Emitted by Motor Vehicles in Motion'.

The relevant standards use the equivalent continuous rating level as a basis for determining what is acceptable. The levels may take single event noise into account, but single event noise by itself does not determine whether noise levels are acceptable for land use purposes. With regards to SANS 10103:2008, the recommendations are likely to inform decisions by authorities, but non-compliance with the standard will not necessarily render an activity unlawful per se. The noise assessment will take these noise standards and impacts into consideration.

4 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

4.1 Mining Operations

In order to access the mineral, box cutting will take place and thereafter an inclined shaft will be excavated for the transportation of personnel and supplies, additionally a vertical shaft will be excavated for hoisting mined ore. A ventilation shaft will be excavated for enhancing circulation of fresh air with the aid of a fan. Alternatively, an inclined shaft will be used for main ore transportation and ventilation, and the vertical shaft will act as the main thoroughfare for employees and materials. The proposed mineral will also be extracted across a horizontal plane, creating horizontal rooms and pillars. To do this, rooms of ore will be excavated while pillars of untouched material are left to support the roof overburden.

Blasting will be required to disintegrate the mineral or undesired material associated with the mineral. Disintegrated material will be transported to the earth surface by means of conveyor belt. The desired material will be stockpiled according to their grades and sizes. The material will be hauled by trucks out of site to the markerts.

Description of the Overall Activities:

The activity relates to an application for a mining right for the extraction of Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals through opencast-underground manner with a planned life of approximately 30 years. An opencast-underground mining will be developed occupying the applied area.

Activities in the mining right area include:

- Open cast pit and underground workings
- Overburden and topsoil dumps
- Haul roads, access roads, maintenance roads and security roads (including a firebreak)
- A processing plant, workshop, warehousing, wash bay and offices
- Plant processing discard dump
- Product stockpiles
- Stormwater management system including pollution control dams, trenches and berms
- A conveyor belt
- Workshop

4.2 Mining Methodology

The proposed mining method for the proposed application will entail opencast to underground mining, this option is influenced by the behavior of the minerals sought-after. Generally opencast mining method recovers a greater proportion of any mineral occurring at shallow depths. Underground mining method is considered less detrimental to the environment and the only viable method to extract minerals at deeper depths. Underground mining will often have a smaller footprint compared to open pit/opencast mine.

During the execution of this activity, mining engineers would start by implementing the opencast mining method and exploit all the minerals at shallow depths. As the mine progresses downwards, there will be a point where economic considerations will dictate the change of the opencast mining method to underground mining method and this is called the Transition Depth.

The generally low strip ratios and wide surface area of the project area makes it ideal for the opencast truck and shovel mining method. Also, the mining method applicability is driven by technical applicability, economic viability, safety, equipment and infrastructure.

The proposed mining method and sequence comprised of the following main mining activities for the extraction of Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals:

- Initial topsoil and soft overburden removal which will be stockpiled to ensure it can be replaced back in the initial box cut;
- The physical mining of the Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals seam which includes drilling of hard overburden material, charging and blasting.
- The Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals will be loaded into trucks and hauled to the crushing and screening facility;
- Discard Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals will be extracted and replaced in the bottom of the opencast pit, while the product will be taken to the weighbridge via trucks and then removed off site;
- The overburden will be replaced back into the pit as mining progresses leaving a minimum area open at a single time;
- The topsoil which was stripped and stockpiled separately before mining commenced is then replaced. The findings of the land capability study will determine the optimal composition to ensure pre-mining conditions for utilization.
- Underground channels will be developed according to the location of the ore
- For minerals such as PGMs, board and pillar method will be applied

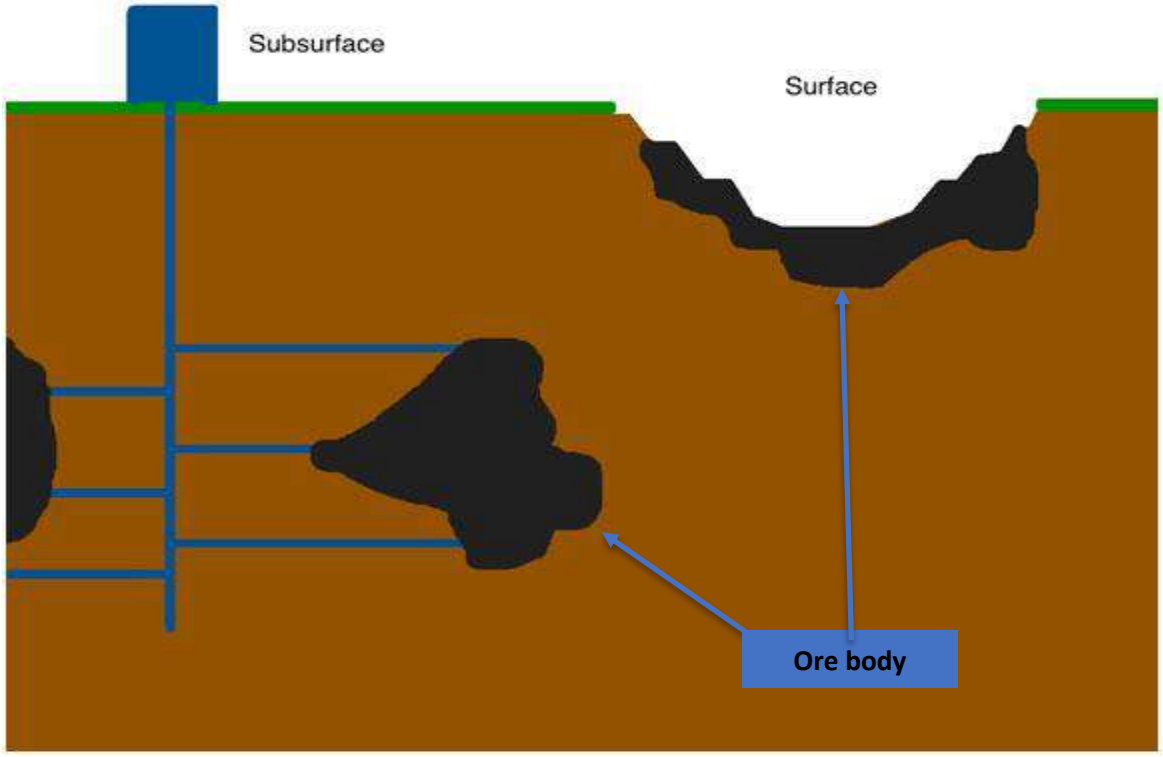


Figure 5: Typical illustration of a Subsurface and Surface Mining taking place simultaneously.

The size and scale of the open pit mine entails that small and conventional truck and shovel mining equipment be used to mine the material.

The following equipment is proposed for this operation:

- A 120t Backhoe hydraulic to excavate Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals for surface activities.
- An Articulated dump trucks ("ADT") to transport overburden and product.
- Hauler selection is based on the optimal fit and number of passes with excavators and loaders with standardization if appropriate.
- Battery powered LHD

4.3 INFRASTRUCTURE REQUIREMENTS

- Access & Haul roads (with necessary security) including the upgrading of the access point to the gravel road;
- Contractor's Yard with septic/chemical ablution facilities;
- Offices;
- Weighbridge, workshop and stores (with septic/chemical ablution facilities);

- Diesel facilities and a hardstand;
- Power and Water;
- Box cut;
- Stockpiles (topsoil, overburden, subsoil/softs, ROM);
- Surface water management measures (stormwater diversion berms and trenches, pollution control dams, tailings dam etc.);
- Crushing, screening & wash facility; and
- Tailings facility.

4.4 LISTED AND SPECIFIED ACTIVITIES

The applicant has applied for a mining right, environmental authorization and water use license for the development of a mine and supporting infrastructure. The listed activities that require environmental authorization in terms of the NEMA EIA Regulations GN R.326/324/325/327 amended on 7 April 2017 and the water uses in terms of section 21 of are indicated in Table 4 below.

Table 4: Listed activities according to NEMA requiring environmental authorization

Government Notice	Activity Number	Description
Listing Notice 1: R.324 on 7 April 2017	**9**	The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more The internal reticulation of water still needs to be finalised

	12	The development of — i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs — a) within a watercourse; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse
	13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more Pollution Control Dams
	14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metre Storage of diesel and other hydro chemicals

Government Notice	**Activity Number**	**Description**
	19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse
		Mining activities associated with the physical mining activities, construction of wetland and stream crossing or any other related mining activities that trigger this activity
	24	The development of a road—

		(i) for which an environmental authorization was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or
		(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres
		Construction of mining road infrastructure which will include service, access and haul roads as part of the proposed mining activities
	25	The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres
		Pollution control dams – confirm during the EIA phase
	28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or ii) will occur outside an urban area, where the total land to be developed is bigger than 1hectare;
	17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.

	19	The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— a) NA; or b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing Relates to the Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals crushing, screening and washing of Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals on site
	24	The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils, but excluding where such extraction or removal is for the rehabilitation of wetlands in accordance with a maintenance management plan. Needs to be confirmed by soil capability study and wetland specialist
Listing Notice 3: R.327 on 7 April 2017	**4**	The development of a road wider than 4 metres with a reserve less than 13,5 metres. Mpumalanga: (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; or (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas, where such areas comprise indigenous vegetation

	10	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, where such areas comprise indigenous vegetation
	12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.
	14	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii)infrastructure or structures with a physical footprint of 10 square metres or more; where suc development occurs— (a) within a watercourse (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; Mpumalanga: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as

		contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves or (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation
Government Notice	**Activity Number**	**Description**
	31	The decommissioning of existing facilities, structures or infrastructure for— **(h) any development and related operation activity or activities listed in this Notice,** **(i) Notice 2 of 2014 or Listing Notice 3 of 2014**
	56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometer— (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; Upgrades to existing roads – to be confirmed during the EIA process
Listing Notice 2: R.325 on 7 April 2017	**4**	The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres. Storage of diesel and other hydrocarbons
	6	The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent Pollution control dam
	15	The clearance of an area of 20 hectares or more of indigenous vegetation Needs to be confirmed from the ecological assessment

Table 5: Water uses according to NWA requiring environmental authorization

Section 21 Water use	Description
21(a)	abstraction of water
21(b)	storage of water
21(c)	impeding or diverting the flow of water in a watercourse
21(f)	discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit
21(g)	disposing of waste in a manner which may detrimentally impact on a water resource
21(i)	altering the bed, banks, course or characteristics of a watercourse
21(j)	removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people

5 NEED AND DESIRABILITY OF PROPOSED ACTIVITIES

5.1 Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals as an Important Resource

The applied minerals are largely needed by industries such as jewelry, decoration and dental works. Some of these applied minerals are widely used as catalysts for chemical reactions. The most important use of PGMs is in vehicles, as catalytic converters facilitating the complete combustion of unburned hydrocarbon passing through the exhaust.

5.2 Justification of Kuthobeka (Pty) Ltd Proposed Opencast-Underground Mining Operations

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, 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 several 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 Kuthobeka (Pty) Ltd Iron Ore, Chrome, PGMs,

Silver, Nickel, Vanadium and Rare Earth Metals mine 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 mining operation will contribute to favorable economic impacts on both a local, regional and national scale. This will result in numerous job creation and skills development opportunities and provide an economic injection in the region. If the project was not to proceed the additional economic activity, skills development and available jobs would not be created, and the Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals reserves would remain unutilized.

Historical geological data have proven that the project is economically viable. Geological report has been attached as appendix. The proposed mining activities fit in with these developments and land uses of the surrounding area (Oshoek Mine). Kuthobeka Pty Ltd project shows good results in Lithium yttrium, Cerium, Lanthanum, Lutetium, Praseodymium, Neodymium, Dysprosium, Rubidium, Cesium, Strontium, Gadolium, Beryllium, Scandium, Molybdenum especially boreholes AJ14, AJ5 and AJ16 holes have samples showing economic values of rare earth elements.

If the applicant is not to proceed with the proposed application, mining of these mineral reserves will not necessarily be avoided, as another application in terms of the MPRDA, Act 28 of 2002 can be made by another company. Unless the government declares these areas as "NO-GO Area" for mining and/or the demand for Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals subsides, mining firms will continue to attempt to mine these Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals reserves. This proposed mining project will contribute to favorable economic impacts on both a local, regional and national scale. This will result in numerous job creation and skills development opportunities and provide an economic injection in the region.

5.3 Period for which Environmental Authorization is Required

The Mining Right and the associated applications is required for a period of 30 years, which gives the mining company additional time to be able to complete the closure activities.

6 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE

The identification and investigation of alternatives is a key aspect during the S&EIA process. All reasonable and feasible alternatives were identified and assessed during the scoping phase to determine the most suitable alternatives to consider and assess during the EIA phase. There are however some significant constraints that must be considered when identifying alternatives for a

project of this scope. Such constraints include social, financial and environmental issues, which will be discussed in the evaluation of the alternatives. The preferred option is to be highlighted and presented to the authorities.

Alternatives can typically be identified according to:

- Location alternatives;
- Process alternatives;
- Technological alternatives; and
- Activity alternatives (including the No-go option).

For any alternative to be considered feasible such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. The alternatives are described, and the advantages and disadvantages are presented. It is further indicated which alternatives are considered feasible from a technical view as well as environmental perspective.

Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation measures and are not specifically identified as distinct alternatives. This section provides information on the development footprint alternatives, the properties considered, as well as the type of activity, activity layout, technological and operational aspects of the mine.

6.1 Location Alternatives

The project area was considered due to the positive results obtained during the prospecting phase with regards to the underlying high-grade Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals. As the applicant already has prospecting rights over the above-mentioned properties, and with the favorable results from the prospecting phase, the proposed project area locality is optimal for mining the proposed minerals, furthermore there is an existing iron ore mine next to the proposed area.

6.2 Land Use Alternatives

The first alternative is mining of Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals due to the results obtained during the prospecting phase, while the second alternative would be to use the area for its agricultural potential (as per the current land use).

- Alternative 1 – Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals mine: Based on the land cover map of the Oshoek Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metal resources are already being mined. The geological reports confirms that the minerals are of a very high grade and the economic injection to the local and regional economy compared to the agricultural sector.
- Alternative 2 – Agricultural land: The current land use of the project area is mainly various agricultural activities.

The land use alternatives need to be investigated in more detail once specialist investigations have been completed in the EIA phase.

6.3 PROCESS ALTERNATIVES

6.3.1 Mining Method

Two alternative options for the main mining process have been identified, namely:

- Open cast: This is the current proposed mining process due to its viability.
- Underground: The other alternatives for mining and extracting target minerals is underground mining due to the depth of the other proposed minerals.

During the EIA process it is recommended to undertake further investigation as to which mining method will cater for all the proposed minerals.

6.4 NO-GO ALTERNATIVE

The no-go alternative would entail not mining the Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals reserve and leaving the area as cultivated or natural lands.

No-Go Alternative: The current land use is mainly cultivated lands and forestry. Should the proposed mining development not take place, it entails that the land will continuously be used for agricultural purposes, depending on the landowners needs and desirability for the future. Food security is

undoubtedly one of the most important sectors nationally, with agriculture contributing to Mpumalanga's and South Africa's GDP, but not nearly as much as the mining sector.

The minerals sought-after are currently becoming very strategic resources in South Africa and, as has also been highlighted in the project motivation, Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals resources are essential to ensure economic growth in South Africa. By not implementing this project more permanent jobs and opportunities for unskilled will not be created and at least 10 million tonnes of Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals which could potentially have benefitted the economy would become sterilized. Although not fully assessed at this time, the potential negative impacts on the environment would not exist should the project not be implemented. The environmental, social and economic impacts will be assessed in detail during the EIA phase to identify and address all negative impacts, where possible.

Decision on whether the No-Go alternative is viable cannot be addressed at this time and will be discussed in more detail during the EIA phase.

7 PUBLIC PARTICIPATION PROCESS (PPP)

7.1 Objectives of Public Participation

- Provides Interested and Affected parties (I&APs) with an opportunity to voice their support, objection, concerns and questions regarding the project, application or decision;
- Provides an opportunity for I&APs, Environmental Assessment Practitioners (EAPs) and the Competent Authority (CA) to obtain clear, accurate and understandable information about the environmental, social and economic impacts of the proposed activity or implications of a decision;
- Provides I&APs with the opportunity of suggesting ways of reducing or mitigating negative impacts of an activity and for enhancing positive impacts
- Enables the applicant to incorporate the needs, preferences and values of affected parties into the application.

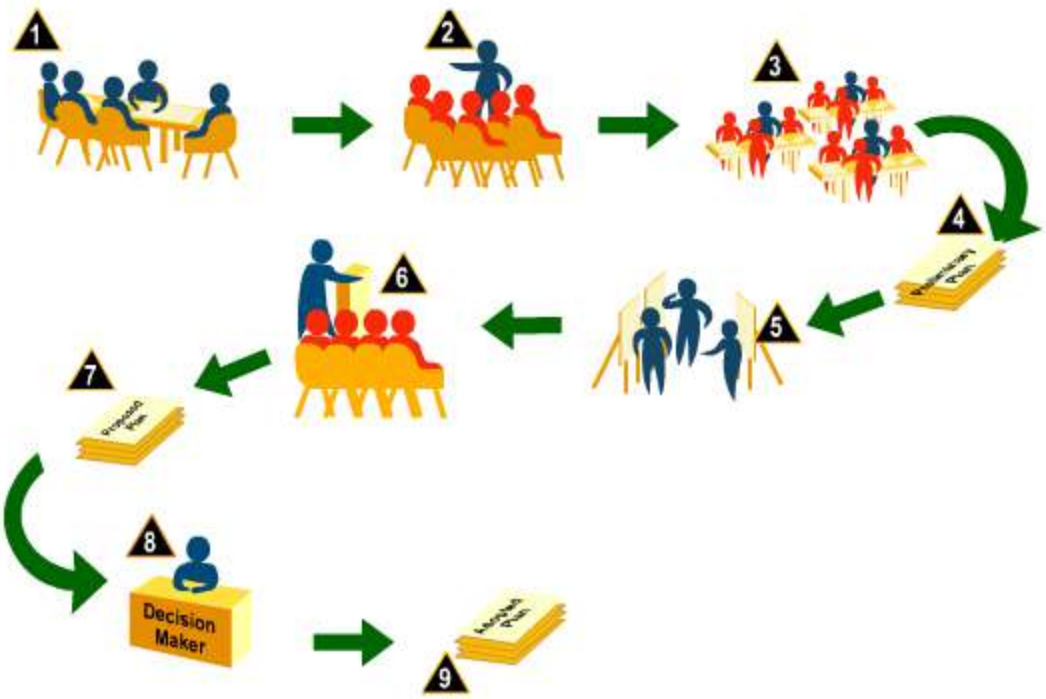


Figure 6: Shows a typical illustration of a Public Participation Process.

7.2 Legislation

The PPP must comply with the several important sets of legislation that require public participation as part of an application for authorization or approval; namely:

- The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002 - MPRDA);
- The National Environmental Management Act (Act No. 107 of 1998 - NEMA);and
- The National Water Act (NWA, Act No. 36. Of 1998).

Adherence to the requirements of the above-mentioned Acts will allow for an Integrated PPP to be conducted, and in so doing, satisfy the requirement for public participation referenced in the Acts. The details of the Integrated PPP are provided below.

7.3 Details of the Public Participation Process Followed

An Interested and Affected Parties (I&AP) database was compiled of key stakeholders and I&AP's identified for notification of the Environmental Authorization Application. Please note that the 1st round of public participation processes (PPP) have taken place for this project thus far.

7.4 Identification of Interested and Affected Parties

Potential Interested and Affected Parties (IAPs) were identified based on the definition of IAPs in the EIA regulations. The IAP database includes authorities and surrounding landowners. The public participation process and consultation was in adherence to the relevant legislation. People and/or organizations were registered as IAPs for the project if they:

- Were landowners or tenants adjacent to the proposed Kuthobeka (Pty) Ltd Project area
- Were local municipality/ ward councilor with jurisdiction in the area
- Were an authority or organ of state having jurisdiction in respect of any aspect of the activity,
- Responded to the Background Information Document (BID), press advertisements (Highvelder) and site posters,
- Attended a public meeting.

A list of all parties that have been identified thus far and is included as Appendix C.

7.4 Notification and Registration of I&APS

Registered Letters and emails were composed and sent to the identified authorities, adjacent landowners, ward councilors and I&APs that have registered thus far. Second Round of PPP entailed:

- Direct email and BID.
- Distribution of BIDs by hand during site visits.
- Press and site notifications.

7.5 Background Information Document (BID)

Included in the I&AP notification letters and e-mails with a Background Information Document (BID). The BID includes the following information:

- Locality map and description
- Project description and background
- Legal framework
- Explanation of the Scoping and EIA Process to be followed
- Provide opportunity to get involve and comment on the proposed project

7.6 Public Review of Draft Scoping Report

This draft scoping report was made available for public review for a period of **30 calendar days** in accordance with Section 40 (3) of the 2014 EIA regulations. The report was be placed for review at Chief Albert Luthuli local municipality and Carolina public library.

7.7 Authority Review of Draft Scoping Report

Copies of this scoping report were provided for authority review from (30 calendar days) in accordance with Section 40 (3) of the 2014 EIA regulations.

7.8 Summary of issues raised by I&AP's

See consultation report. (Attached as Appendix B)

8. ENVIRONMENTAL ATTRIBUTES AND DESCRIPTION OF THE BASELINE ENVIRONMENT

8.1 Regional Geology

Nickel mineralogy is extremely complex, however excellent descriptions of South African nickel minerals are presented by Cairncross and Dixon (1995). Economic nickel deposits are of two types: magmatic sulphide deposits and residual or lateritic deposits. Only sulphide deposits are being exploited in South Africa. Of the magmatic-hosted deposits nickel may occur in the form of massive, disseminated sulphide segregations in tabular or stratiform layers in transgressive sequences, or pipe-like or irregular bodies.

The magmatic, disseminated-massive nickel deposits of the Uitkomst Complex was first recorded as platinum-bearing and a altered sill of Archaean pyroxenite on the farm Uitkomst 541 JT, 20km north of Badplaas. This area was systematically investigated during the 1970's by a JV between Anglo-American Corporation and the International Nickel Company of Canada. Anglovall Ltd in the 1980's discovered an important extension of this body on the adjoining farm Slaaihoek 540 JT.

An idealized cross section of the Uitkomst Complex (ARM, 2007) shows the basal part of the complex being that targeted area. The chromitites, peridotites and lower pyroxenites area identified.

The main mineralized zone (MMZ) is in the lower harzburgite and is fairly consistent throughout the length of the trough. It is typically about 300m wide and 2-40m thick. The Basal Mineralized Zone, hosted by the basal gabbro varies in thickness between 1-3,5m. The high-grade massive sulphide body (MSB) is in the quartzite and granite footwall with an aerial extent of 450 by 250m and thickness of between 1-25m.

The geology of the area is well documented. Suffice to say that the Nkomati mine about 70km NW of the farms in question is South Africa's only primary nickel mine and is a polymetallic deposit. Anomalous results of Nickel, copper, chrome and PGMs are evident in the area. The Nkomati mine is a low cost mine, costing about US$ 0, 75/lb nickel net of by products (ARM presentation, 2007). It hosts a large resource and according to ARM has further room for growth.

There is very little literature available on lithium work done in Mpumalanga. Lithiumbearing pegmatite veins have intruded tonalite-trondhjemite gneisses close to the northern margin of the potassic Mpuluzi granite batholith, on the farms Oshoek 212 IT and Houtbosch 189 IT only a few kilometers west of the Swaziland border and about 6 km southeast of the study area. Limited prospecting for lepidolite apparently took place during the 1950's and early 1960's. Barite deposits

on Witklip 188 IT and Houtbosch 189 IT are a continuation of the Londosi River deposit in the Onverwacht Group across the border in Swaziland. Barite was mined until 1976 on the estern bank of the Londosi river in northwestern Swaziland. The Houtbosch deposit was investigated in the 1950's when 25 tons were produced.

The barite occurs as bands and lenses with a maximum thickness of 45cm, a dip of 330 East and north-south strike length of about 400m. It occurs at the contact between quartz-sericite schist and banded amphibolite of the Theespruit Formation. During 1985 the South African Development Trust Corporation concluded that the deposit was not economically feasible.

8.2 Local Geology

The project area is dominantly covered by felsic and intermediate rocks of Dalmein Granodiorite together with mafic and ultramafic rocks of an Onverwacht group of Barberton Super Group. The Mpuluzi batholith is one of the key belts for Archaean greenstone studies and represents a type locality of Paleoarchean supracrustal sequences. The belt consists of a NE-SW striking succession of supracrustal rocks, termed the Barberton Supergroup (Swaziland Supergroup in the older literature). The belt has a strike length of 130 km, a width of 10-35 km, and an approximate depth of 4-5 km, and is surrounded by granitoid domes and intrusive sheets. Stratigraphy The volcano-sedimentary sequence of the Barberton Super Group has been subdivided into three stratigraphic units, the Onverwacht, Fig Tree and Moodies Groups (SACS, 1980). The Onverwacht Group consists predominantly of ultramafic and mafic volcanic rocks (komatiites, komatitic basalts, basalts), with minor felsic volcanic and sedimentary rocks that were deposited in a deep to shallow marine environment. Ultramafic-mafic igneous complexes also occur.

The Fig Tree Group consists of deep to shallow marine sandstone and shale with minor jaspilitic banded iron formation and felsic volcanic rocks. The Moodies Group consists of shallow marine to fluvial sandstone and conglomerate with minor shale and banded iron formation. Dalmein Granodiorite is a phaneritic texture intrusive igneous rock similar to granite but containing more plagioclase feldspar than orthoclase feldspar. This rock occurred in the central part of the project area as a pluton. Granodiorite has a greater than 20% quartz by volume, and between 65% to 90% of the feldspar is plagioclase. A greater amount of plagioclase would designate the rock as tonalite. Granodiorite is felsic to intermediate in composition. It's the intrusive igneous equivalent of the extrusive igneous dacite. It contains a large amount of sodium (Na) and calcium (Ca) rich plagioclase, potassium feldspar, quartz, and minor amounts of muscovite mica as the lighter coloured mineral components. Biotite and amphiboles often in the form of hornblende are more abundant in granodiorite than in granite.

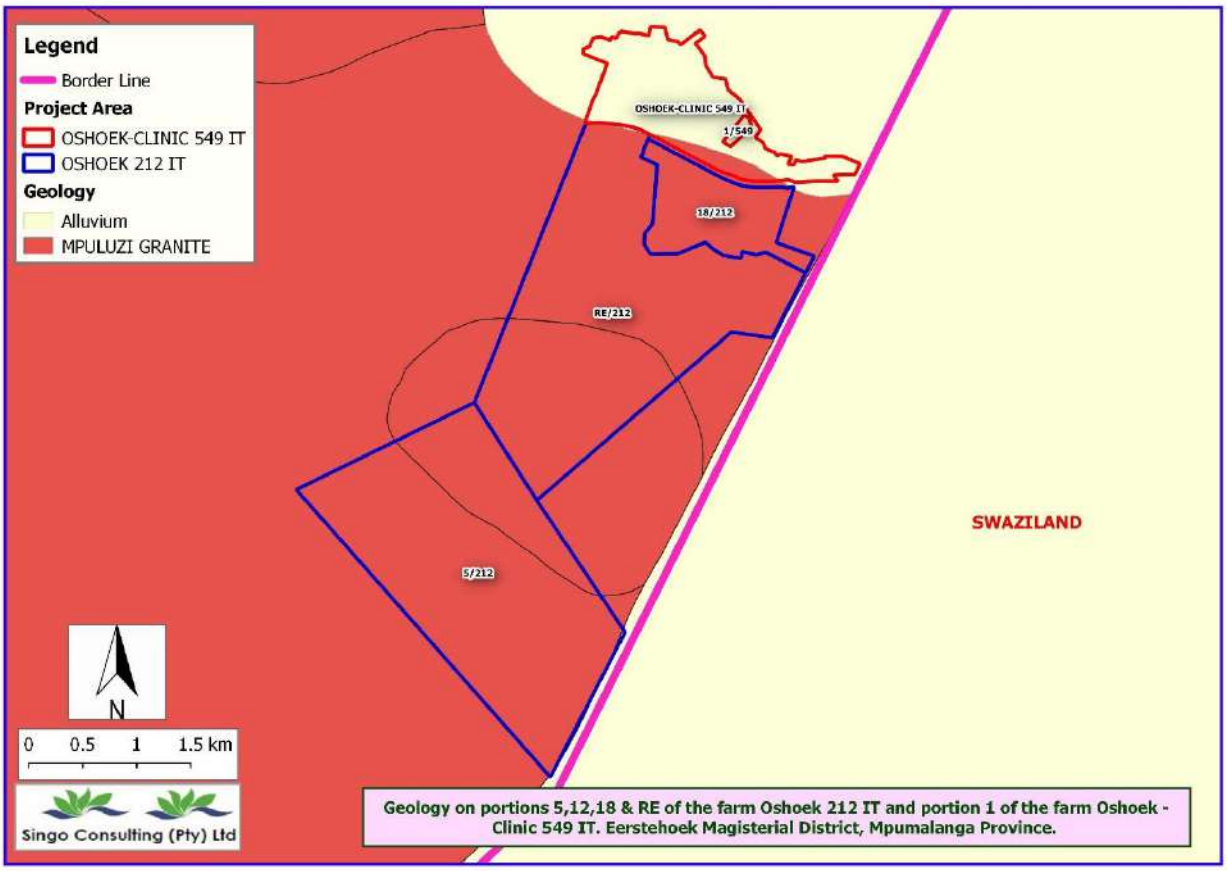


Figure 7: Shows the local geology of the proposed area.

8.3 Soils

A soil specialist has been appointed that will assess the soils, land uses and capability of the land to determine baseline conditions prior to mining. The specialist report will be made available during the EIA phase. Desktop studies currently depicts that the area is comprised of undifferentiated structureless soils and shallow soils on a hard or weathering rock.

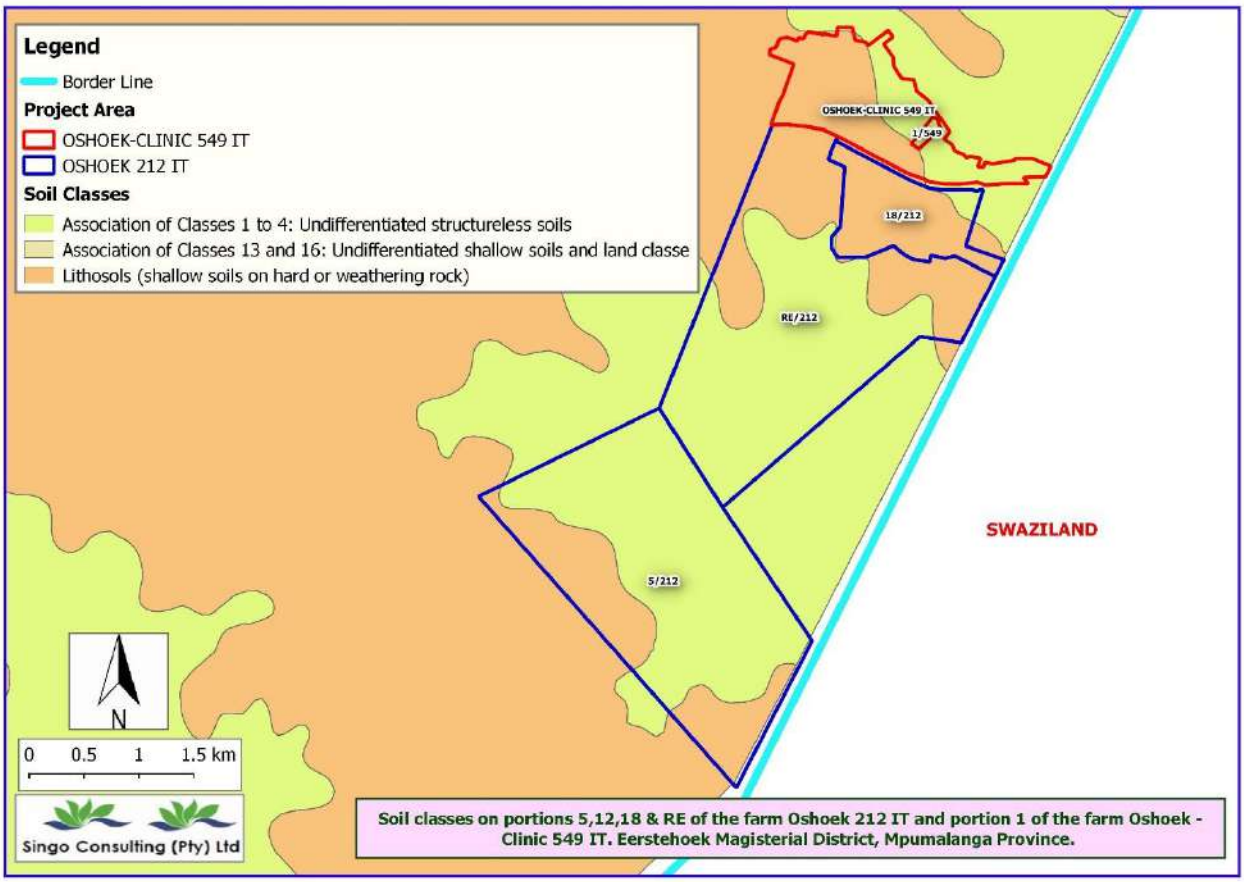


Figure 8: Shows the type of soils occurring in the proposed area.

Figure 9: Shows the type of soil occurring in the proposed area.

8.4 Vegetation

The environmental attributes largely determine the graphical distribution of plant species and plant communities. A knowledge of the physical environment is thus a prerequisite for the understanding and ecological interpretation of plant communities identified during site visit. As observed on the figure below, the area is covered by two types of vegetation namely, the sour lowveld bushveld and the north-eastern mountain grassland. North-Eastern Mountain Grassland covers about 70% of the proposed area and the rest is the sour lowveld bushveld.

North-Eastern Mountain Grassland

According to birdlife the North-Eastern Mountain Grassland holds 78 endemic and near-endemic plant species, mostly in the Liliaceae families, on Black Reef quartzites. A further 31 endemics area found on dry dolomites.

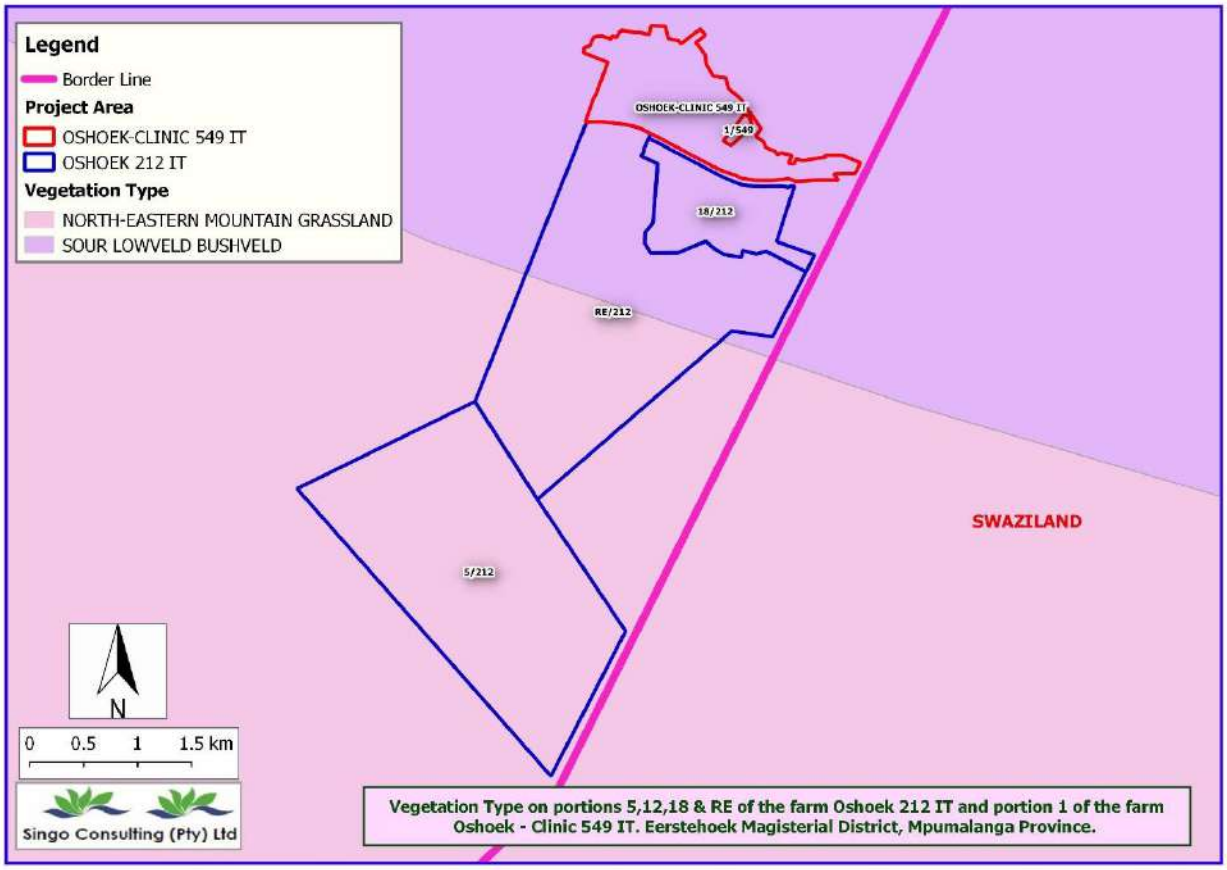


Figure 10: Shows the type of vegetation in the proposed area.

Figure 11: Shows the type of vegetation in the proposed area.

8.5 Climate

Climate, topography, soil and other biotic factors are considered as potentially restrictive factors in plant growth. Of the above factors, climate is considered as the most restrictive as vegetation is directly or indirectly dependent on climatic factors for the availability of minerals, growth and reproduction. These climatic factors are radiation, temperature and precipitation. Although the united effect of these factors exerts influence on vegetation, each may vary on macro-, meso- and micro-scale.

8.5.1 Temperature

Air temperature is essential, both for determining the effect of plume buoyancy (the larger the temperature difference between the plume and the ambient air, the higher the plume can rise), and determining the development of the mixing and inversion layers. The project area on average experiences minimum temperatures of 2.1 – 4 ° C annually. The figure below illustrates the average temperatures experienced by the project area.

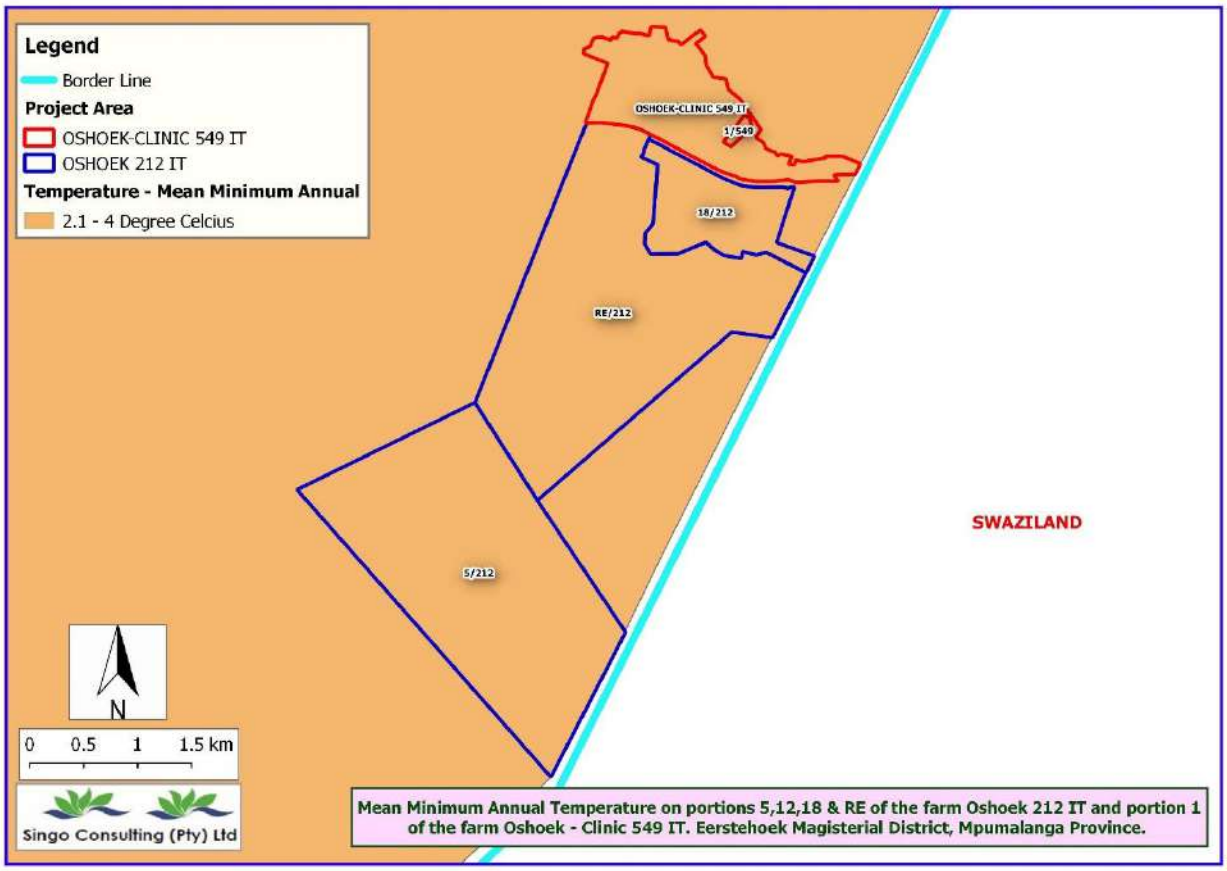
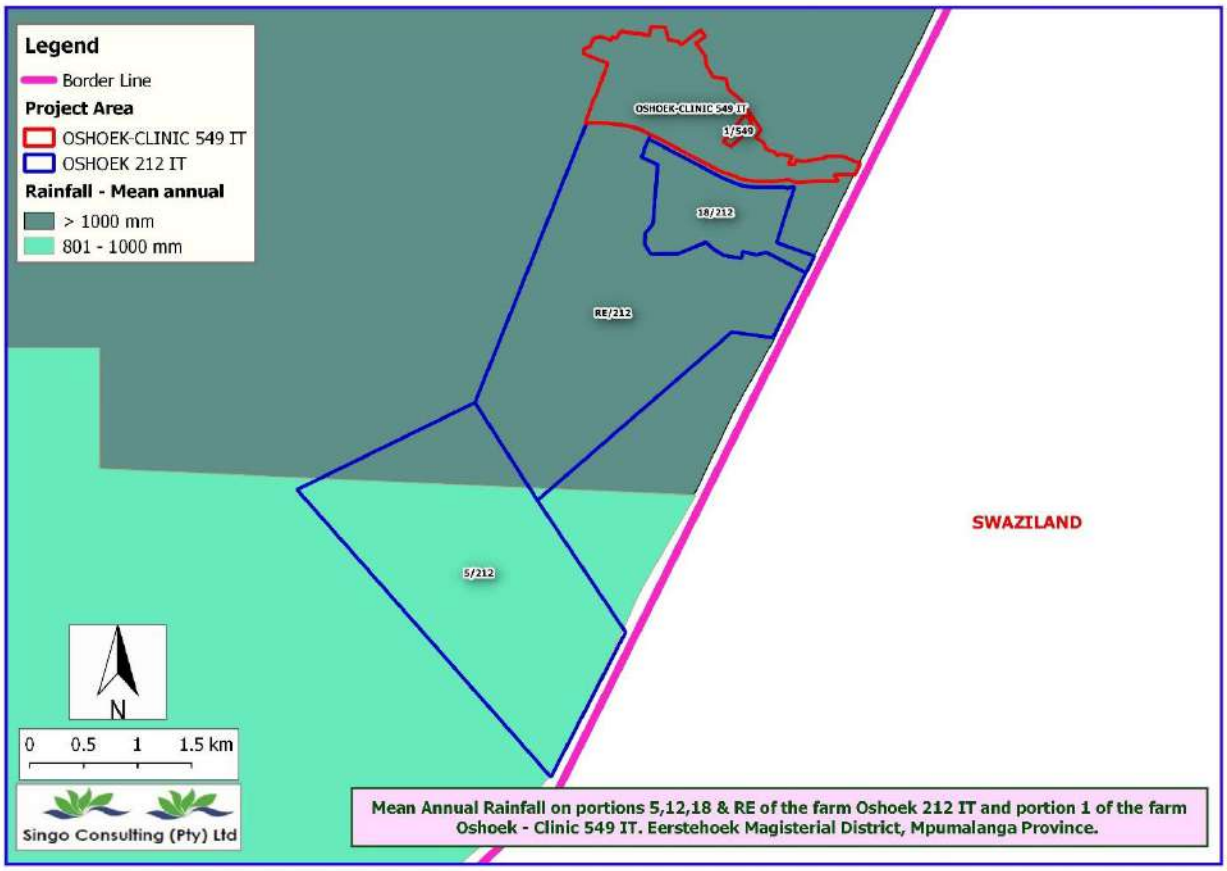


Figure 12: Shows the average temperatures experienced by the project area.

8.5.2 Rainfall

Rainfall is generally defined as a form of precipitation characterized by the return of water from the sky to the ground. Rain is in the form of a liquid precipitation. The proposed area is 1 435.0233 hectares in extent, the northern part of the area receives less than 1000mm annually and the southern part receives about 801-1000mm annually. The amount of rainfall received by the area reveals various factors about the surface water of the area. The area is densely saturated with groundwater and there are perennial and non-perennial streams.



Climate is the statistics of weather over long periods of time. It is measured by assessing the patterns of variation in temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle count and other meteorological variables in each region over long periods of time. Climate differs from weather, in that weather only describes the short-term conditions of these variables in each region.

8.5.3 Frost

Moderate frost - screen minimum less than 0 °C - occurs in 15 percent of the years, with a mean frost season length of 2 days. Frost may be expected to occur during the winter months of June and July.

8.5.4 Wind

The wind field was dominated by winds from the north-west; north-east; and, less frequently the south-west. Calm conditions occurred less than 1% of the time. During the day, winds at higher wind speeds occurred more frequently from the easterly sector, with 0.2% calm conditions. Night-time airflow had winds also most frequently from the easterly sector but at lower wind speeds. The

frequency of night-time calm conditions increased to 0.9%, relative to daytime. Summer and spring show similar wind direction profiles to the period average, while autumn and winter show the more frequent winds from the south-west. There is an increased frequency of wind speeds of 3 m/s or more during spring.

8.6 Flora & Fauna

8.6.1 Flora

According to the desktop study that was conducted, the study area falls within the sour lowveld bushveld, where most of the forestry plantations occur.

The proposed area is dominantly covered by the sour lowveld bushveld. This type of vegetation is dominant in the Mpumalanga region especially in mountainous areas. See the figure below. According to the studies available online on the Mountainlands website, Plants differ widely through the various habitats, many of which can be encountered within a short walk from one another. The vegetation is mostly Sour Bushveld of the Savanna Biome merging into the North-eastern Mountain Sourveld of the Grassland Biome at higher elevations. The range in elevation and broken mountainous topography support a rich biodiversity (both plant and animal species), which also includes various elements of the Cape Fynbos.

- **Flora sensitivity assessment**

The sensitivity assessment is an attempt to identify those parts of the project area that may be sensitive to disturbance or of high conservation value. Areas containing untransformed natural vegetation, high diversity or habitat complexity, Red List organisms or systems vital to sustaining ecological functions are considered sensitive. In contrast, any transformed area that has no importance for the functioning of ecosystems is considered to have low sensitivity.

- **Plant species noted on site**

  Identified plant species on site consists of sensitive species, 455, 14, 29, 30, 24, 104 Gerbera Aurantiaca and asparagus fractiflexus. According to the screening tool that was conducted, the sensitivity of the area is rated High, clearing of vegetation should be avoided. In order to avoid clearing of vegetation on site, the contractor will be inducted by the Environmental Control Officer on site during the operation.

Table 5: Red data species potentially occurring in the project area according to the environmental screening tool database.

Sensitivity	Features
Medium	Melanospermum italae
Medium	Sensitive species 14
Medium	Sensitive species 29
Medium	Sensitive species 30
Medium	Sensitive species 24
Medium	Cephalaria foliosa
Medium	Gerbera aurantiaca
Medium	Indigofera hybrida

8.6.2 Fauna

The faunal communities in the project area were investigated in detail along with the sensitivity of their habitats. Major habitats of these faunal communities are described in the preceding flora section. A wide range of biotic and abiotic factors play a role when an animal selects a habitat. These include plant species present, vegetation structure, topography, pedology, climate, distance to water, presence of rocky outcrops, trees, predators and enough food. The level of human disturbance also influences habitat selection.

- **Habitat types on site**

In the study area, the main habitat types available are various grass species, bushes, wetland habitat, and stream. The species most likely to occur are grassland specialists, species linked to wet habitats and those with wide habitat tolerances.

- **Terrestrial fauna diversity in the site**

Prospecting activities particularly drilling may result in localized loss of animal habitats-microhabitats due to disruption of the soil profile and stripping of vegetation. This will result in the temporal migration of animals away from the proposed prospecting area. Once the prospecting ceases, it is anticipated that animals will migrate back to the site

8.8 Surface and Ground Water

8.8.1 Surface Water

The proposed area is characterized by perennial and non-perennial rivers. Two running streams were observed on site during the site assessment. Due to the general slope of the area, all the streams are flowing to the south east of the area. The figures below depict the streams that were observed on site.

Figure 13: Shows the actual streams observed on site.

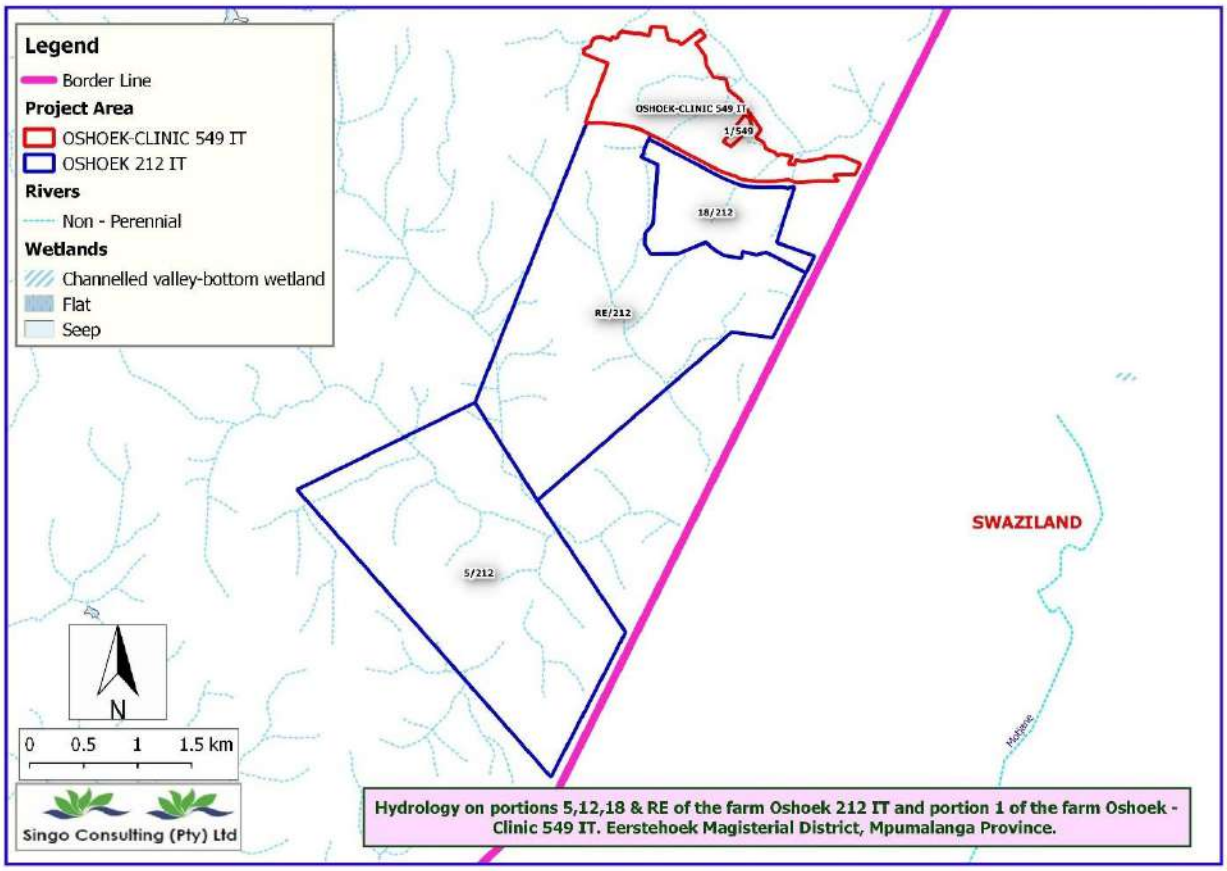


Figure 14: Shows the hydrology of the proposed area.

8.8.2 Ground Water

Since mining activities can potentially impact on the groundwater, a description of the current groundwater conditions is required. A geohydrologist has been appointed to investigate the prevailing groundwater conditions. This will serve as a reference baseline for quantifying potential mining impacts on the existing groundwater regime.

The geohydrological specialist investigation will include:

- Aquifer characteristics;
- Hydro census;

8.9 Topography

Steep slopes and mountainous areas are to be found in the western part and along the eastern boundary of the municipality (Albert Luthuli).

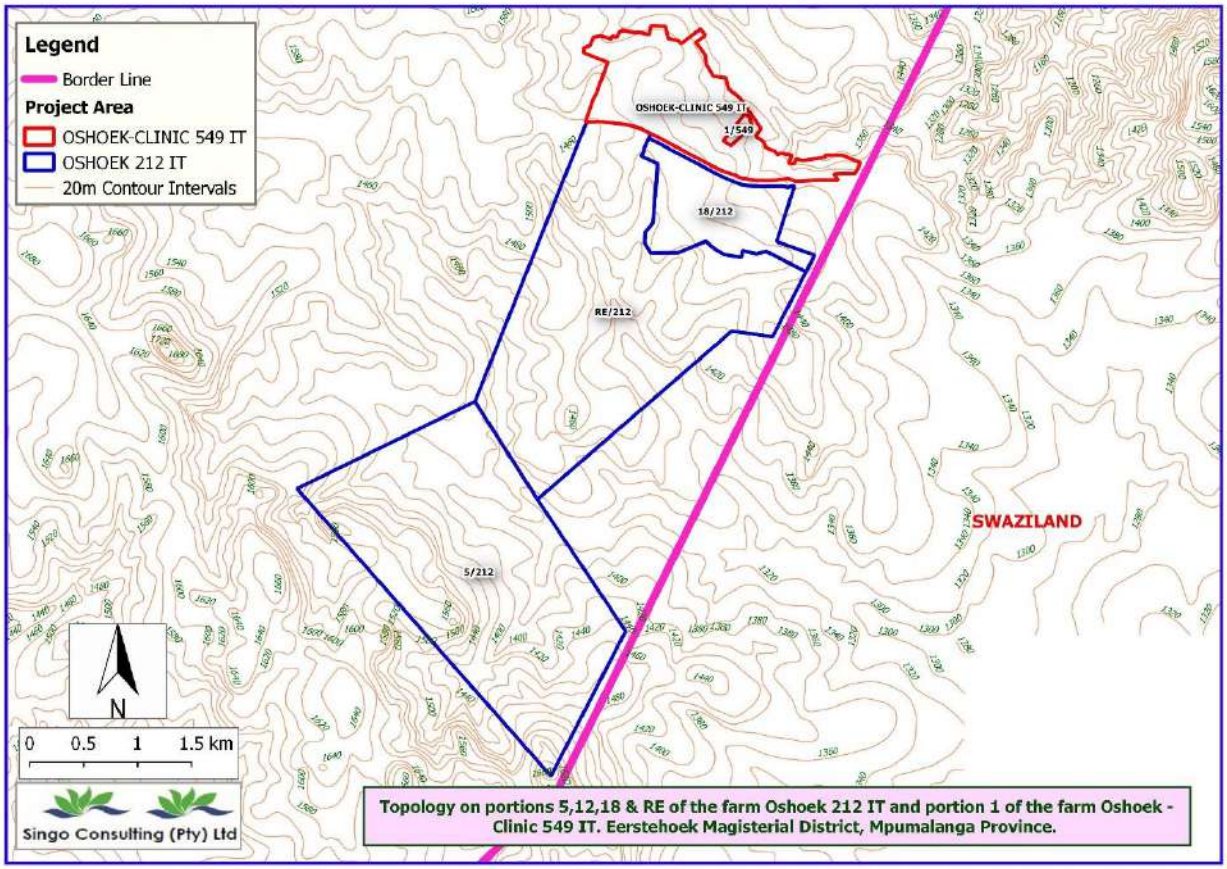


Figure 15: Shows the topography of the proposed area.

8.10 AIR QUALITY

Factors which contribute to the areas baseline ambient air quality are the local industrial developments, existing filling stations, traffic on the surrounding road networks, and the rail traffic. The impacts of the proposed mine activities will be investigated during impact assessment by an air quality specialist.

8.11 HERITAGE AND CULTURAL

A Phase I Heritage Impact Assessment (HIA) including a Paleontological Desktop Assessment will be done as part of the specialist investigations.

The objectives for the cultural and archaeological study will be:

- To obtain a good understanding of the overall archaeological and cultural heritage conditions of the area through a brief desktop study;
- To locate, identify, record, photograph and describe sites of archaeological and cultural importance;
- Should any sites be identified to propose a study method forward;
- Ensure that all requirements of the local South African Heritage Resources Agency (SAHRA) are met; and
- Report on the results of the archaeological and cultural heritage survey adhering to minimum standards as prescribed by the SAHRA and approved by the Association for Southern African Professional Archaeologist (ASAPA).

The HIA specialist assessment will be available during the EIA phase.

Figure 16: Shows the grave observed on site.

8.12 SOCIO-ECONOMIC CHARACTERISTICS

The project area is in Albert Luthuli Local Municipality, Mpumalanga province.

8.12.1 Socio-Economic

One of the primary determinants of development is the ability of individuals and communities to have access to employment. One of the aims of this project is to provide employment to residents.

8.12.2 Population Demographics

The population of Albert Luthuli municipality shows a typical age structure of a very young population distribution from 2001-2014. According to both 2001 & 2011 censuses it shows that the young generation from 0-34 year's shares more than 75% of the total population, which will put more pressure in the municipality for provision of good education, improved health and job creation. In 2001, there was no evidence of declining in the age group 0-4 years compared to other age group however a decline was observed in children aged 0-4 years in 2011. This could be attributed to fertility decline or high child mortality. However, according to the projected population of 2014, the pyramid shows an increased in the same age group of 0-4. It further indicates that since 2001 Albert Luthuli Municipality is experiencing a decline in the group 5-14 years from 40.8% in 2001 to 35.4% in 2011. The proportion of women in the population has remained unchanged from 2001 to 2011 at 53%, and 47% for males.

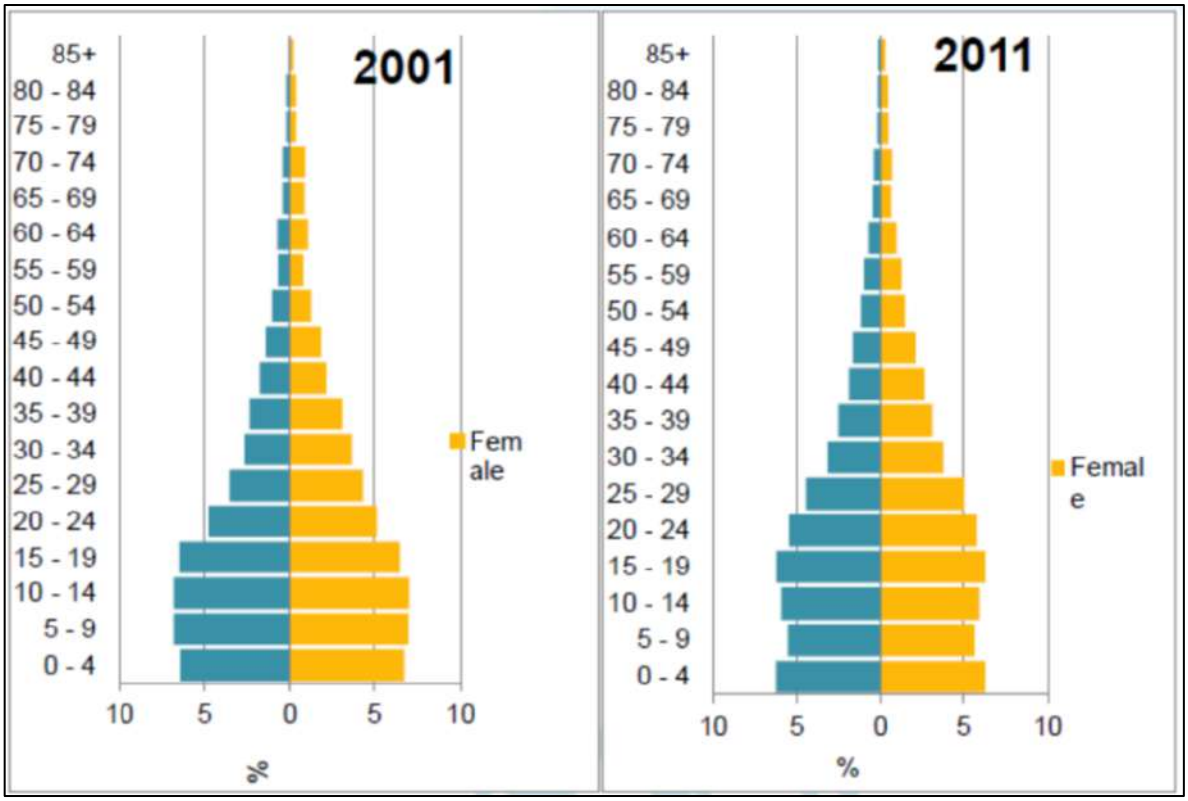


Figure 17: The population of Albert Luthuli municipality (Stats SA Census 2001 and 2011).

8.12.3 Education

The Figure below represents the overall educational attainment the population older than 20 years in Albert Luthuli local municipality. There were major improvements in educational attainment within the municipality between 2001 and 2011. In1996 47% had had no schooling and this decreased to 26% in 2011 which indicates favorable improvements in educational attainment over a period of 15 years.

Although there have been improvements in the attainment of matric as well as post matric qualifications, this will not translate into employment if the types of education and training does not match the needs in the labour market.

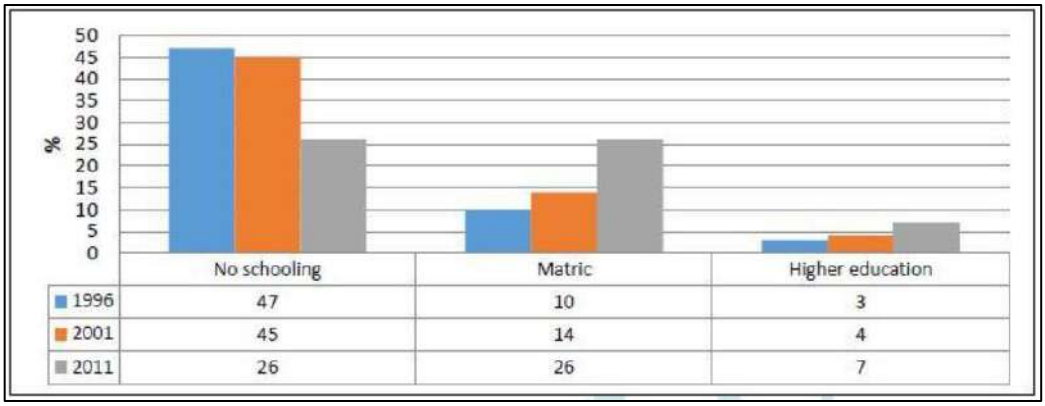


Figure 18: Highest educational attainment for persons 20+ (Stats SA Census 1996, 2001, 2011).

8.12.4 Employment and Income

The unemployment rates for all groups have decreased from 2001 to 2011 but are still high. This strict definition however does not consider discouraged work seekers.

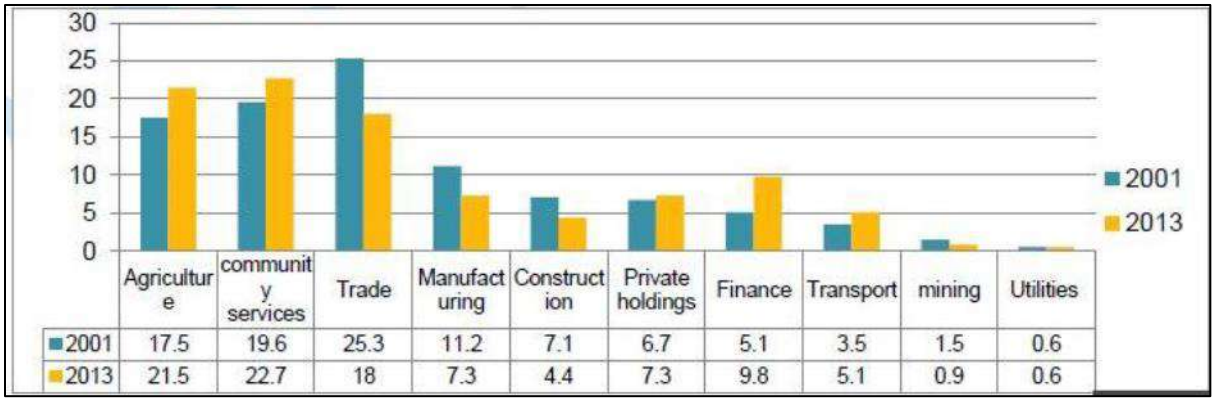
The unemployment rates for women and for youth aged 15-35 are significantly higher than for the general population aged 15-64 years. The inability of these vulnerable groups to access employment is a major determining factor in their general development. In the case of women heading households it will also affect the development status of the entire household.

Education is not only one of the main factors that contribute unemployment but is a key indicator of development in general.

Table 6: Unemployment rate according to Stats SA census 1996, 2001, 2011.

Unemployment Rates (strict definition)	1996	2001	2011
Unemployed 15-64	34.79	41.46	34.29
Women unemployment 15-64	45.34	52.34	42.51
Youth unemployment 15-35	40.57	47.47	41.53

According to the Figure below, the leading industries in terms of employment per sector in 2001 were community services, agriculture and trade. However, in by 2013 trade had decreased by 7 percentage points. The decreases in manufacturing and construction are concerning since these sectors have some of the best potential in creating employment and economic growth. Employment in turn directly affects personal and household income and directly influences the ability of the households to pay rates and taxes.



	Agriculture	community services	Trade	Manufacturing	Construction	Private holdings	Finance	Transport	mining	Utilities
2001	17.5	19.6	25.3	11.2	7.1	6.7	5.1	3.5	1.5	0.6
2013	21.5	22.7	18	7.3	4.4	7.3	9.8	5.1	0.9	0.6

Figure 19: Department of Finance: Socio Economic Status 2013.

9. IMPACTS ASSESSMENT

9.1 METHODOLOGY

Direct, indirect and cumulative impacts of the issues that will be identified during the specialist investigations will be assessed in terms of these standard rating scales to determine their significance. The rating system used for assessing impacts (or when specific impacts cannot be identified, the broader term issue should apply) is based on five criteria, namely:

1. Status of impacts (Table 9) – determines whether the potential impact is positive (positive gain to the environment), negative (negative impact on the environment), or neutral (i.e. no perceived cost or benefit to the environment);
2. Spatial scale of impacts (Table 10) – determines the extent of the impact on a scale of localized to global effect. Potential impact is expressed numerically on a scale of 1 (site-specific) to 5 (global);
3. Temporal scale of impacts (Table 11) – determines the extent of the impact in terms of timescale and longevity. Potential impact is expressed numerically on a scale of 1 (project duration) to 5 (permanent);
4. Probability of impacts (Table 12) –quantifies the impact in terms of the likelihood of the impact occurring on a percentage scale of <5% (improbable) to >95% (definite); and
5. Severity of impacts (Table 13) – quantifies the impact in terms of the magnitude of effect on environment (receptor) and is derived by consideration of points 1, 2 and 3 above. For this project, a conservative approach is adopted for severity (e.g. where spatial impact was 2 and temporal impact was considered to be 3, a value of 3 would be adopted as a conservative estimate for severity of impact).

Table 7: Status of Impacts

Rating	Description	Quantitative Rating
Positive	A benefit to the receiving environment (positive impact)	+
Neutral	No determined cost or benefit to the receiving environment	N
Negative	At cost to the receiving environment (negative impact)	-

Table 8: Spatial scale of Impacts

Rating	Description	Quantitative Rating
Very Low	**Site Specific** – impacts confined within the project site boundary	1
Low	**Proximal** – impacts extend to within 1 km of the project site boundary	2
Medium	**Local** – impacts extend beyond to within 5 km of the project site boundary	3
High	**Regional** – impacts extend beyond the site boundary and have a widespread effect - i.e. > 5 km from project site boundary	4
Very High	**Global** – impacts extend beyond the site boundary and have a national or global effect	5

Table 9: Temporal scale of Impacts

Rating	Description	Quantitative Rating
Very Low	**Project duration** – impacts expected only for the duration of the project or greater than 1 year	1
Low	**Short term** – impacts expected on a duration timescale of 1 to 2 years	2
Medium	**Medium term** – impacts expected on a duration timescale of 2-5 years	3
High	**Long term** – impacts expected on a duration timescale of 5-15 years	4
Very High	**Permanent** – impacts expected on a duration timescale exceeding 15 years	5

Table 10: Probability of Impacts

Rating	Description	Quantitative Rating
Highly Improbable	Likelihood of the impact arising is estimated to be negligible; <5%.	1
Improbable	Likelihood of the impact arising is estimated to be 5-35%.	2
Possible	Likelihood of the impact arising is estimated to be 35-65%	3
Probable	Likelihood of the impact arising is estimated to be 65-95%.	4
Highly Probable	Likelihood of the impact arising is estimated to be > 95%.	5

Table 11: Severity of Impacts

Rating	Description	Quantitative Rating
Very Low	Negligible – zero or very low impact	1
Low	Site specific and short-term impacts	2
Medium	Local scale and / or short-term impacts	3
High	Regional and / or long-term impacts	4
Very High	Global scale and / or permanent environmental change	5

These five criteria are combined to describe the overall significance rating (Table 9-13). Calculated significance of impact – determines the overall impact on (or risk to) a specified receptor and is calculated as: the product of the probability **(P)** of the impact occurring and the severity **(S)** of the impact if it were to occur (**Impact = P × S**). This is a widely accepted methodology for calculating risk and results in an overall impact rating of Low **(L),** Low/Medium **(LM)**, Medium **(M)**, Medium/High **(MH)** or High **(H).** The significance of an impact is depicted in Table 15 and assigned a particular color code in relation to its severity.

Table 12: Significance of Impacts

Rating	Description		Quantitative Rating
Low	P × S = 1-3	(low impact significance)	**L**
Low/Medium	P × S = 4-5	(low/medium impact significance)	**LM**
Medium	P × S = 6-9	(medium impact significance)	**M**

Medium/High	P × S = 10-12	(medium/high impact significance)	**MH**
High	P × S = 13-25	(High impact significance)	**H**

Table 13: Perceived Significance of Impacts

Probability (P)	Severity (S) 1	2	3	4	5
1	L	L	L	LM	LM
2	L	LM	M	M	MH
3	L	M	M	MH	H
4	LM	M	MH	H	H
5	LM	MH	H	H	H

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **Insignificant:** the potential impact is negligible and will not have an influence on the decision regarding the proposed development;
- **Low:** the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed development;
- **Low/Medium:** the potential impact may not have any meaningful influence on the decision regarding the proposed activity/development;
- **Medium:** the potential impact should influence the decision regarding the proposed activity/development;
- **Medium/High**: the potential impact will affect the decision regarding the proposed activity/development; and
- **High:** the proposed activity should only be approved under special circumstances.

Practicable mitigation and optimization measures are recommended, and impacts are rated in the prescribed way both without and with the assumed effective implementation of the recommended mitigation (and/or optimization) measures.

Mitigation and optimization measures are either:

- **Essential:** measures that must be implemented and are non-negotiable; or
- **Best Practice:** recommended to comply with best practice, with adoption dependent on

the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

The model outcome is then assessed in terms of impact certainty and consideration of available information. Where a particular variable rationally requires weighting, or an additional variable requires consideration the model outcome is adjusted accordingly.

9.2 IDENTIFICATION OF IMPACTS

Potential impacts resulting from the proposed mining operation were identified during the scoping phase using input from the following sectors:

- Views of interested and affected parties;
- Existing information based on literature reviews and desktop assessments (EAP and specialist inputs);
- Site visit with the project team;
- Guidelines; and
- Legislation

The following potential impacts were identified:

- Ground and Surface Water contamination;
- Disturbance of Geology and Soils;
- Land uses and capability;
- Socio-economic Impacts;
- Waste Products;
- Flora and Fauna Impacts;
- Traffic Impacts;
- Impacts on watercourses including wetlands;
- Dust and Air Quality Impacts;
- Noise Impacts;
- Visual Impacts;
- Blast and Vibration Impacts;
- Heritage and cultural resource impacts; and
- Paleontological Impacts.

Proposed Specialist Studies to Assess the Environmental Impacts during the EIA phase: Geohydrological Investigation, Impact Assessment and Modelling;

- Wetland Delineation and Impact Assessment (PES and EIS);
- Aquatic ecology and surface water assessment;
- Flood line determination;
- Terrestrial ecology including flora and fauna;
- Civil Engineering Pollution Control Dam Designs and Storm-water Management Plan,
- Baseline Ambient Air Quality Assessment;
- Baseline Noise Assessment;
- Blasting and Vibration Assessment;
- Soils and Land Capability assessment;
- Agricultural Input assessment;
- Visual impact Assessment;
- Traffic impact Assessment;
- Heritage Impact Assessment; and
- Paleontological Desktop Assessment.

9.3 POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITIES/ DEVELOPMENT AND ALTERNATIVES

Currently, a comprehensive impact assessment cannot be conducted for the anticipated impacts; however, the anticipated impacts can be discussed, and an indication provided whether it will be positive or negative (Table 9-8)

Table 14: Potential Impacts prior to mitigation measures

Impact	Status of Impacts Prior to Mitigation	Proposed Mitigation/ Improvement Measures
Terrestrial Ecology		

The clearance for the construction of the proposed structures and infrastructure will result in habitat loss	Negative	• Keep the footprint of the disturbed area to the minimum and designated areas only. • Unnecessary vegetation clearing should be avoided. • Ensure rehabilitation plans are initiated during and after construction in areas not affected by the mining operations. • Vegetation clearing on slopes should be minimized and where necessary, appropriate stormwater management should be put in place to limit erosion potential of exposed soil. • No harvesting of indigenous tree species for firewood should be permitted. • An environmental induction for all staff members must be mandatory to discuss the potential of fire e.g. only smoking in designated areas, no open cooking fires etc.

Impact	Status of Impacts Prior to Mitigation	Proposed Mitigation/ Improvement Measures
Displacement of flora and fauna species of conservation concern (SCC)	Negative	• SCC should either be relocated or protected *in situ*, depending on the species under question and the decision of the competent authority. • Set aside areas allowing continued existence of SCC • The layout design for the proposed mine should be adjusted to exclude sensitive areas. • Keep the footprint of the disturbed area to the minimum and designated areas only. • An environmental induction for all staff members must be mandatory to discuss these impacts such as the presence of SCC which may not be damaged, caught or removed without a permit.

Accidental introduction of alien species and invaders	**Negative**	• **Eradication and/ or control of alien invasive plants and weeds as per the alien and invasive species monitoring programme.** • **Disturbance of natural areas should be avoided as far as possible and the spread of alien flora into natural areas should be controlled.** • **Continuous monitoring of the growth and spread of alien and invasive flora coupled with an adaptive management approach to identify suitable control mechanisms (e.g. mechanical, chemical or biological control). Mechanical control is usually preferred.** • **Cleaning of vehicles and equipment before entering natural areas to remove large deposits of foreign soils and plant material sourced from elsewhere.**

Faunal mortalities	**Negative**	• **An environmental induction for all staff members must be mandatory in which specific issues related to the killing and/or disturbance of faunal species should be avoided. Several staff members should complete a snake handling course in order to safely remove snakes from designated areas.** • **Road mortalities should be monitored by both vehicle operators (for personal incidents only) and the ECO (all road kill on a periodic monitoring basis as well as specific incidents) with trends being monitored and subject to review as part of the monthly reporting. Monitoring should occur via a logbook system where staff takes note of the date, time and location of the sighting/incident. This will allow determination of the locations where the greatest likelihood exists of causing road mortality and allow mitigation against it (e.g. fauna underpasses, and seasonal speed reductions). Finally, mitigation should be adaptable to the onsite situation which may vary over time.** • **All staff operating motor vehicles must undergo an environmental induction training course that includes instruction on the need to comply with speed limits, to respect all forms of wildlife (especially reptiles and amphibians) and, wherever possible, prevent accidental road kills of fauna. Drivers**

		not complying with speed limits should be subject to penalties. • **The proposed prospecting activities will result in the deaths of numerous fauna species. It is suggested that construction and mining operations occur from a predetermined area and move along a gradient to allow fauna species to relocate.**

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
		• **The ECO should monitor live animal observations in order to monitor trends in animal populations and thus implement proactive adaptable mitigation of vehicle movements.** • **Should holes or burrows be located on site, contact a zoological specialist to investigate and possibly remove any species located within them.** • **Where possible, barriers around excavation sites should be erected to prevent fauna from falling into the excavations.** • **The area surrounding the bulk sampling operation needs to be demarcated and fenced off to restrict animals from moving into this area, which will reduce fauna mortalities.**
Surface and Groundwater		
Hydrology patterns	Negative	• Make use of permeable materials for pavements and walk- ways. • The planned reduction in catchment size will be managed to ensure that there will not be a dramatic reduction in catchment size.

Water quality	Negative	• Baseline water quality needs to be established. • Ongoing water monitoring during the construction phase and post-mining to demonstrate compliance and ensure reactive measures in case of pollution events. • Clean and dirty water separation must be undertaken and clean water areas must be maximised. Reuse of inpit/dirty water needs to be maximised.

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
Ground and Surface water contamination	Negative	• Prevention of contaminated surface runoff which might impact to the water resource used by downstream users. • All hazardous chemical must be stored in a bunded facility. Handling of such chemicals must be undertaken on a non-permeable surface. • All hydrocarbons, lubricants and explosives should be adequately stored and bunded off to prevent any contamination to the groundwater during an accidental spill. • All water that may collect in an area used for the storage of hydrocarbons must pass through an oil water separator before been discharged as dirty water. • Spillages on open soil must be contained and removed and treated as hazardous waste. • Emergency response plan to be put in place if spillages occur. • Regular inspection should be conducted of storage facilities • Implement effective concurrent rehabilitation of the opencast pit area. • Long-term management of mine affected water including potential decant to form part of the mine's water management strategy.

Potential reduction of catchment yield of the aquifers through dewatering	Negative	• Conduct regular monitoring of groundwater levels as per the recommendations of the geohydrological report.
Washing plant	Negative	• All runoff from the plant area must be collected and treated as dirty water.

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
Excavated materials that are stockpiled incorrect areas can interfere with the natural drainage, cause sedimentation and water pollution	Negative	• The areas excavated should have berms that are vegetated in order to separate dirty and clean water systems, and as an erosion control measure. • The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams as well as surface water resources. • Upslope diversion and down slope silt containment structures should be constructed. • Monitoring of surface water resource pre-mining and during construction must be implemented as per the monitoring programme.
Destruction of wetlands and watercourses	Negative	• Construction of infrastructure located close to local streams should take place in the dry season, when possible. • Minimise the planning of mining activities within 100 m or 1:100 year flood event of watercourses. • Mining activities undertaken within a watercourse or buffer area as determined by wetland specialist will result in application of a water use licence.
Geology and Soils		

Land use change which will affect the soil and land use capability both during construction phase and post-mining operations. Loss of agricultural soils and land expected.	Negative	• Should the No-Go alternative not be considered, mining activities should be located on low-medium agricultural potential land to minimise impacts. • Compensate landowners. • Rehabilitate areas disturbed by mining with the intention to return land to arable land where feasible. If not, other land uses at the time (decommissioning phase) deemed socially, economically or environmentally applicable should be considered.

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
Site clearance and levelling during the construction phase will cause some additional exposed areas and could trigger erosion and siltation, especially during rainy periods	Negative	• Prevent soilloss through erosion. • Develop appropriate storm water management system to control surface run off over exposed areas. • Preserve soil fertility for later use. • Ensure all vehicles stay within the designated areas (for example, away from watercourses). • Plan to construct the majority of development during the dry winter months. • Have in place temporary erosion and sedimentation trapping control measures during the construction phase
Storage of topsoil	Negative	• Remove and stockpile topsoil from roads, building platforms, stockpile and dam areas prior to construction. • Preserve topsoil and store in an appropriate manner to maintain viability and seed bank for future rehabilitation. • Store away from watercourses to prevent sedimentation and erosion. • Protect from alien plant establishment.
Social		
Recruitment strategies for the mine	Positive	NA

Advantage to previously disadvantage individuals	Positive	NA
Community development programmes	Positive	NA
Upgrades and expansion of services will benefit local area	Positive	NA

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
Economic		
Increased income generation for local community	Positive	NA
Increased job opportunities for local mining communities	Positive	NA
Economical injection to the area and Gauteng	Positive	NA
Loss of agricultural jobs	Negative	• Recruit and train farm labourers no longer employable due to cessation/reduction of agricultural activities. • Alternatively, assist in the employment of these farm workers within the agricultural industry.
Noise		

Noise emanating from heavy machinery and transport vehicles	Negative	• Noise barriers in the form of berms should be constructed as close to the noise sources as possible. • Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers where possible. • Noisy machinery to be used predominately during daylight hours. • Grievance mechanism to record complaints should be kept on site and investigated. • Regular monitoring of noise to take place.
Noise from blasting	Negative	• Blasting operations are generally intermittent and should be limited to daylight hours when ambient noise levels are highest.

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
Visual		
Infrastructure (e.g. Contractor's yard, weighbridge, workshop and stores)	Negative	• To reduce the visual impact of permanent structures, colours for roofing, walls etc. should be of a matt finish to reduce reflection. • Infrastructure should be located away from sensitive and elevated areas.
Location of stockpiles, pollution control dams and tailing dams	Negative	• Locate away from roads and settlements as far as possible. • Topsoil stockpiles will need to be vegetated as soon as possible, to reduce the risk of erosion and decrease the visual disturbance. • Height of stockpiles to be kept as low as possible to reduce visual impact. • Plant vast growing indigenous trees around the dams to enhance sight.

Lighting pollution	Negative	• Avoid up-lighting of structures but rather direct the light downwards and focused on the object to be illuminated. • Use non-UV lights where possible, as light emitted at one wavelength has a low level of attraction to insects. This will reduce the likelihood of attracting insects and their predators specifically in the site camps.
Heritage and Cultural		
Heritage resources disturbed / destroyed	Negative	The HIA investigation will identify resources and sites to be avoided or removed/ relocated. The specialist recommendations will be required.

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
Paleontological sites disturbed / destroyed	Negative	The HIA investigation will identify resources and sites to be avoided or removed/ relocated. The specialist recommendations will be required.
Cultural places disturbed / destroyed	Negative	The HIA investigation will identify resources and sites to be avoided or removed/ relocated. The specialist recommendations will be required.
Traffic		
Increased traffic volumes on the existing road networks	Negative	• Speed limits must be implemented on site as well as safety controls. • Construction of access roads within safety limits from other crossings. • Possible road upgrades where required. • Create safe environment for pedestrians, animals and motorists. • Create fauna underpasses where necessary (example bridge crossings).
Blasting and Vibration		

Blasting and Vibration	Negative	• Pre-blast survey of all structures identified surrounding the mining area. • Ground vibration survey in the form of signature trace study to be done for determination of ground vibration constants that can be used for accurate prediction of ground vibration. • Investigate the possibility of alternative methods to blasting.
Safety		
Blasting		• Areas to be clearly demarcated and signs to be erected indicating blasting zones.

Impact	**Status of Impacts Prior to Mitigation**	**Proposed Mitigation/ Improvement Measures**
Roads and vehicles		• Speed limits must be in place on site and before access roads on a provincial or national road. • Ensure drivers are trained in road safety.
Surrounding neighbours		• Personnel are not permitted on other properties without permission. • Avoid conflict with surrounding landowners.
Air Quality		

Dust pollution		• The removal of vegetation will be minimised during stripping to reduce the effects of dust pollution as a result of exposed soil. • Water or dust control agents should be used in working areas, and roads will be sprayed for dust suppression on a regular basis in designated susceptible areas during heavy usage. • Dust monitoring must be undertaken in accordance to the monitoring programme. • It is recommended that topsoil stockpiles should be vegetated to sustain biological components as well as prevent dust emissions. • Reduction of dust fallout levels and particulate matter. • All Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals haul trucks must be covered by a tarpaulin. • The overland conveyor belt should be covered and Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals on the conveyor should be sprayed to reduce emissions.

9.1 MITIGATION MEASURES

The impacts that are generated by the development can be minimized if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimize impacts and achieve sustainable development. This will be assessed and discussed in more detail during the EIA phase.

9.1 MOTIVATING THE PREFERRED SITE

As a result of the scoping phase impact assessment and the sensitivity mapping exercise, a preferred layout alternative will be identified and will be assessed further in the EIA phase assessment.

9 PLAN OF STUDY

The Scoping Phase has identified potential environmental impacts and discussed the alternatives considered. The section below outlines the proposed plan of study which will be conducted for the various environmental aspects during the EIA Phase. It is also important to note that the plan of study will also be guided by comment obtained from I&AP's and other stakeholders during the PPP.

9.1 THE OBJECTIVES OF THE IMPACT ASSESSMENT PHASE WILL BE TO

- Identify and assess the environmental (biophysical and social) impacts of the construction, operation, decommissioning and post closure impacts of the proposed development. The cumulative impacts of the proposed development will also be identified and evaluated;
- Alternative activities and locations will be determined and assessed in parallel with the proposed activity;
- Identify and evaluate potential management and mitigation measures that will reduce the negative impacts of the proposed development and enhance the positive impacts;
- Compile monitoring, management, mitigation and training needs in the EMPR; and
- Provide the decision-making authorities with sufficient and accurate information in order to make a sound decision on the proposed development.

9.2 TASKS TO BE UNDERTAKEN DURING THE IMPACT ASSESSMENT PHASE

The Impact Assessment Phase has four key elements, as follows:

Specialist Studies: Specialist studies identified during the Scoping Phase, and any additional studies that may be required by the authorities, are undertaken as the initial phase of the EIA. The relevant specialists are appointed to undertake the various assessments. Specialists gather baseline information relevant to the study being undertaken and assess impacts associated with the development. Specialists also make recommendations to mitigate negative impacts and optimize benefits. The resulting information is synthesized into the draft EIA report that will be made available to I&APs for review

- Environmental Impact Assessment Report (EIAR): The main purpose of this Report is to gather environmental information and evaluate the overall impacts associated with the project, to consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIAR also identifies mitigation measure/management recommendations to minimise negative impacts and enhance benefits. The draft EIAR and associated reports will be made available for public and authority review and comment for a period of 30 days. The availability of the draft EIAR will be communicated to all registered I&APs and will be easily accessible. After comments have been received the final EIAR will be compiled and submitted to the competent authority (DMR) for review. This report will assist the DMR in making an informed decision.

- Environmental Management Programme (EMPr): The EMPr provides guidelines to the proponent and the technical team on how to best implement the mitigation measure/management recommendations outlined in the EIAr during the construction,

operational and decommissioning/rehabilitation phase. The EMPr is a law binding document, and once approved cannot be amended without permission from the DMR.

- Public Participation Process: The PPP initiated during the Scoping Phase, is continued. This includes continuous engagement with I&APs and stakeholders which includes meetings, receiving comments, issues and concerns raised by I&APs and the authorities during the review period, and also provides relevant responses to these comments.

9.1 DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED INCLUDING THE OPTION OF NOT GOING AHEAD WITH THE ACTIVITY

According to the MPRDA and NEMA regulations, feasible alternatives need to be considered and assessed during the Scoping and Impact Assessment Phase of the project. During the Scoping Phase, based on professional judgement of the EAP, the engineering designs, specialist inputs, and I&AP comments, alternatives have been considered.

The alternatives identified must serve to achieve the triple bottom-line of sustainability i.e. they must meet the social, economic and ecological needs of the public. The alternatives must also aim to address the key significant impacts of the proposed project by maximising benefits and avoiding or minimizing the negative impacts. The primary objective must be to avoid all negative impacts, rather than to minimise them.

The "feasibility" and "reasonability" of and the need for alternatives must be determined by considering, inter alia:

- The general purpose and requirements of the activity;
- Need and desirability;
- Opportunity costs;
- The need to avoid negative impact altogether;
- The need to minimise unavoidable negative impacts;
- The need to maximise benefits, and
- The need for equitable distributional consequence.

A comparative assessment, in fulfilment with the above listed criteria, of all alternatives identified will be undertaken as part of the Impact Assessment Phase.

9.1 DESCRIPTION OF THE ASPECT TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The following specialist studies based on mentioned aspects will be assessed further during the EIA phase investigation to be undertaken:

- Soil, Land Capability and Land Use;
- Surface Water;
- Geohydrology;
- Cultural and Heritage Resources;
- Paleontological Impacts;
- Economic Impacts;
- Social Impacts;
- Air Quality;
- Waste Classification;
- Closure;
- Noise;
- Terrestrial ecology;
- Visual Impacts;
- Traffic Impacts; and
- Blasting and Vibration.

In addition, the following will continue during the EIA phase:

- Public participation and consultation
- Environmental Management Programme
- Alternatives
- Amend site layout designs and Mining Works Progarmme

9.2 PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS INCLUDING THE PROPOSED METHOD OF ASSESSING ALTERNATIVES

Refer to section 9.1 for more details.

9.3 THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

Competent authorities will be consulted during the initial notification period, the scoping phase, and during the EIA phase.

A scoping phase meeting will be held with the DMR and DWS, although initial contact has been made. No additional Authority meetings are scheduled during the scoping phase; unless an authority requires a meeting one will be arranged. The purpose of the Authority meeting would be to explain the project in detail to authorities and clarify the process going forward.

Other stakeholders that will be included are the District and Local Municipalities, Ward Councillors, and others identified during the Scoping Phase.

The consultation process to be followed as part of the review and decision-making stages include:

- Scoping review and decision-making stage;
- Environmental impact assessment review and decision-making stage; and
- The environmental authorisation decision making and appeal process stage.

9.4 PARTICULAR TO THE PUBLIC PARTICIPATION PROCESS WITH REGARDS TO THE IMPACT ASSESSMENT PROCESS THAT WILL BE CONDUCTED

Competent authorities, stakeholders and I&APs will be consulted during the initial notification period, the scoping phase, and during the EIA phase.

9.4.1 Steps to be taken to notify interested and affected parties

A detailed description of the PPP conducted for the scoping phase is described in Section 7 above and Appendix B.

I&APs were notified of the proposed application via newspaper advertisements, emails, site and public notices, registered letters and facsimiles. The PPP will be undertaken in accordance with the NEMA process and the 2014 Regulations (as amended). A minimum of 30 days will be provided to the public to register as I&AP's and to provide initial comments, and 30 days will be provided to comment on the draft Scoping Report. The information submitted by I&AP's will be utilised during the Impact Assessment and compilation of the EIAR. Should the Final Scoping Report be accepted by the competent authority, an EIA process will be undertaken.

During the EIA phase I&APs, stakeholders and the competent authorities will be notified of the process to be undertaken (similar way as described in Section 7 above and as outlined in the NEMA regulations (2014, as amended), will be provided an opportunity to comment on the draft EIAR which will include specialist studies and attend a public meeting).

9.4.2 Details of the engagement process to be followed

The process of identifying and contacting landowners, stakeholders and I&APs commenced when I&APs were notified as part of site and public notices, newspaper adverts, emails, registered letters and distribution of the Background Information Document (BID). Landowners and their contact details was identified through the prospecting phase register, direct consultation and/or Title Deed search for the properties falling within the proposed study area. Proof of notifications and documentation pertaining to the PPP will form part of the public participation records as part of the Scoping and Environmental Impact Assessment phase.

As mentioned above, during the EIA phase I&APs will be afforded the following opportunities to participate in the project:

- I&APs will be requested via notifications to provide their comments on the project, notified when the draft EIAR will be available for review and notified of a public meeting that will take place;
- The EIAR and EMPr will be available for comment for a period of 30 days at the same public places in the project area that the Scoping Report will be made available, sent to stakeholders who request a copy.

All comments and issues raised during the public comment period will be incorporated into the Final EIAR and EMPr to be submitted to the competent authorities for review and the final decision-making stage.

I&APs will be notified about the decision of the competent authority within 14 days of receiving written letters and will specify any further process that is to be undertaken such as the appeal process.

9.4.3 Description of the information to be provided to Interested and Affected Parties

The following information but not limited to this will be made available to I&APs:

- Background Information Document: The aim of the BID is to inform all Interested and Affected Parties about the proposed project and process to be followed during the scoping and EIA phase which includes the undertaking of PPP and environmental impact assessment process for the compilation of the Environmental Impact Assessment, Environmental Management Programme and Waste Management Licence for the proposed mining activities;
    - The site plan, scale and extent of activities to be authorized;
    - Draft Scoping Report which will include:

- the plan of study;
- list of activities to be authorized according to NEMA, NEM: WA and NWA;
- indication and discussion of the impacts of activities to be authorized;
- the proposed specialist studies that will be undertaken as part of the project;
- the proposed mining methods to be used;
- discussion of alternatives including location, process and methodology as well as the No-Go alternative; and
- Details of the MPRDA, NEMA, NEM: WA and NWA Regulations (including a list of other applicable regulations) that must be adhered to.

• Draft EIR and EMPr which will include the results from the specialist assessments will also be made available for public review and comment for a period of 30 days; and

• Information will also be made available as requested by the Interested and Affected Parties throughout the process.

10. DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN DURING THE EIA PROCESS

As discussed in detail in the above sections and summarised below, the following tasks will be undertaken as part of the EIA phase of the project:

• Finalization of the legislative context within which the activities are located and document how the proposed activity complies with and responds to this;

- Finalisation of the activities triggered under NEMA and NEM:WA based on the specialist assessments and the final design layout and specifications;
- Identification of the location of the development footprint within the preferred site based on impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- Identification of the most ideal location for the activities within the preferred site based on the lowest level of environmental sensitivity identified during the assessment, especially with the proposed sitting of the mining infrastructure;
- Determination of the nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and degree to which these impacts can be reversed, may cause irreplaceable loss of resources, can be avoided, managed or mitigated
- Identification of suitable measures to avoid, manage or mitigate identified impacts;

- Detailed specialist studies;
- Continued Public Participation Process;
- Compilation of the draft EIA report and EMPr, and once the consultation, review and commenting period has finished the finalisation of the EIA report and EMPr which will be submitted to the competent authority for review and final decision making.

11. MEASURE TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEEDS TO BE MANAGED AND MONITORED

Please refer to Table 9-8.

12. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

12.1 COMPLIANCE WITH THE PROVISION OF SECTION 24(4)(A) AND (B) READ WITH SECTION 24 (3) (A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) THE EIA REPORT MUST INCLUDE THE: -

12.1.1 Impact on the socio-economic condition of any directly affected person

This is dependent on the results of the Social Impact Assessment which will also be addressed in the Social and Labour Plan (SLP). Full details will be made available during the EIA phase after the specialist studies have been conducted and consultation with the community, stakeholders and other I&APs.

The proposed Kuthobeka (Pty) Ltd Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals Mine will provide employment opportunities, skills development, social development programmes, community upliftment and economic injection to the local area. Furthermore, impacts including visual, traffic, service delivery, land use changes and security and safety will be assessed and discussed during the EIA phase.

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

A Heritage Specialist has been appointed and the results of the assessment will be made available in the EIA phase.

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

Section 24(4)(b)(i) of the NEMA (as amended), provides that an investigation must be undertaken of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity. Alternatives have been discussed in Section 6 of this draft Scoping Report and will be addressed in detail during the EIA phase once the specialist assessments and comments received from I&APs, stakeholders and the competent authorities have been received.

14. ASSUMPTIONS, LIMITATIONS, AND UNCERTAINTIES

Certain assumptions, limitations, and uncertainties are associated with the Scoping Phase. This report is based on information that is currently available and, as a result, the following limitations and assumptions are applicable**:**

• This report is based on project information provided by the client;

• This report is based on a project description taken from client meetings, preliminary drawings and design specifications for the proposed mine that have not yet been finalised and which are likely to undergo a number of iterations and refinements before they can be regarded as definitive and proposed methodology for the mining operations. Detailed information will be provided in the EIA Phase;

• No specialist studies have been completed for the scoping phase. Descriptions of the environmental, economic and social environments are based on limited desktop assessments and available literature for the area. More detailed information will be provided in the EIA phase based on the outcomes of the specialist studies. Limited scoping-phase specialist input was obtained for inclusion in this report;

• The description of the baseline environment and where possible the up-to-date information has been obtained from various sources. More detailed information will be provided in the EIA phase based on the outcomes of the specialist studies, the finalization of the Mining Works Programme and design layout;

• A detailed impact assessment cannot be done at present as the levels of confidence are considered too low until detailed specialist input and comments from the I&APs are obtained which will be presented and discussed in more detail during the EIA phase.

15 UNDERTAKINGS

15.1 REGARDING CORRECTNESS OF INFORMATION

I Siyabonga Mashigo herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

_____

Signature of the EAP

_____

Date

16 REFERENCES

Census 2011: Statistics South Africa (2011) South African Population Census 2011. Indicators derived from the full population Census https://wazimap.co.za/profiles/ward-74203012-lesedi-ward-12-74203012/

DEA. 2013. Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute. Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Pretoria. 100 pages.

Department of Mineral Resources. 2011. A beneficiation Strategy for the minerals industry of SA. http://www.foresightfordevelopment.org/sobipro/55/1291-a-beneficiation-strategy-for-the-minerals-industry-of-south-africa

Department of Water and Sanitation. 2014. A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub Quaternary Reaches for Secondary Catchments in South Africa. Secondary: [W5 (for example)]. Compiled by RQIS-RDM http://www.dwa.gov.za/iwqs/rhp/eco/peseismodel.aspx.

Eskom. 2017. ASH MANAGEMENT IN ESKOM: Generation Communication CO 0004 Revision 13 (June 2017). http://www.eskom.co.za/AboutElectricity/FactsFigures/Documents/CO0004AshManagementRev13.pdf

Galvin, J.M. 2016. Chapter 8: Pillar Extraction IN: Ground Engineering - Principles and Practices for Underground Iron Ore, Chrome, PGMs, Silver, Nickel, Vanadium and Rare Earth Metals Mining. Springer International Publishing Switzerland.

GDARD. 2011. Gauteng Department of Agriculture and Rural Development. Gauteng C-Plan 3.3 Terrestrial CBAs and EASs 2011 [vector geospatial dataset] 2011. Available from the Biodiversity GIS website

GDARD. 2014a. Technical Report for the Gauteng Conservation Plan (Gauteng C-Plan v3.3). Gauteng Department of Agriculture and Rural Development: Nature Conservation Directorate. 60 pages.

GDARD. 2014b. GAPA IV (Gauteng Agricultural Potential Atlas version 4). GDARD. Johannesburg. GEOTERRAIMAGE. 2015. 2013 - 2014 South African National Land Data User Report and Metadata.

MUCINA, L. AND RUTHERFORD, M.C. (eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria.

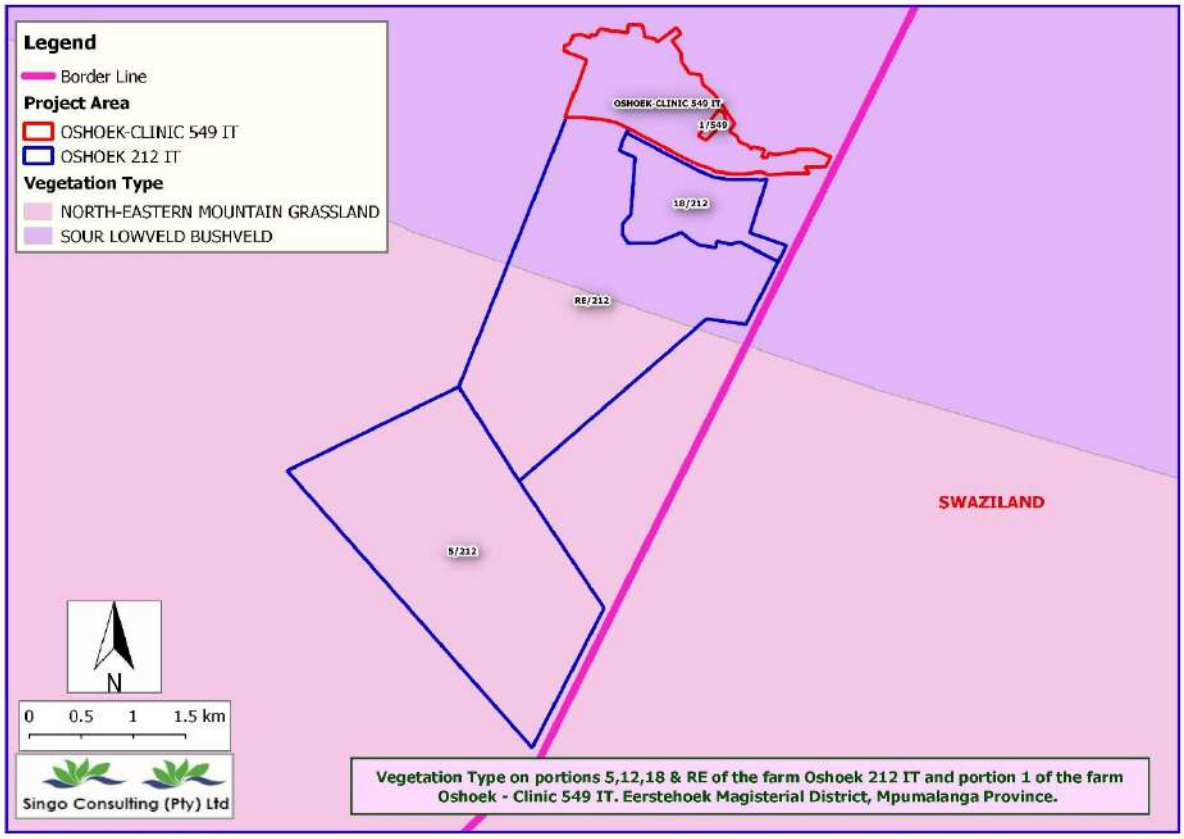
SANBI (South African National Biodiversity Institute). Mining and Biodiveristy Guidelines 2012 [Raster] 2012. Available from the Biodiversity GIS website

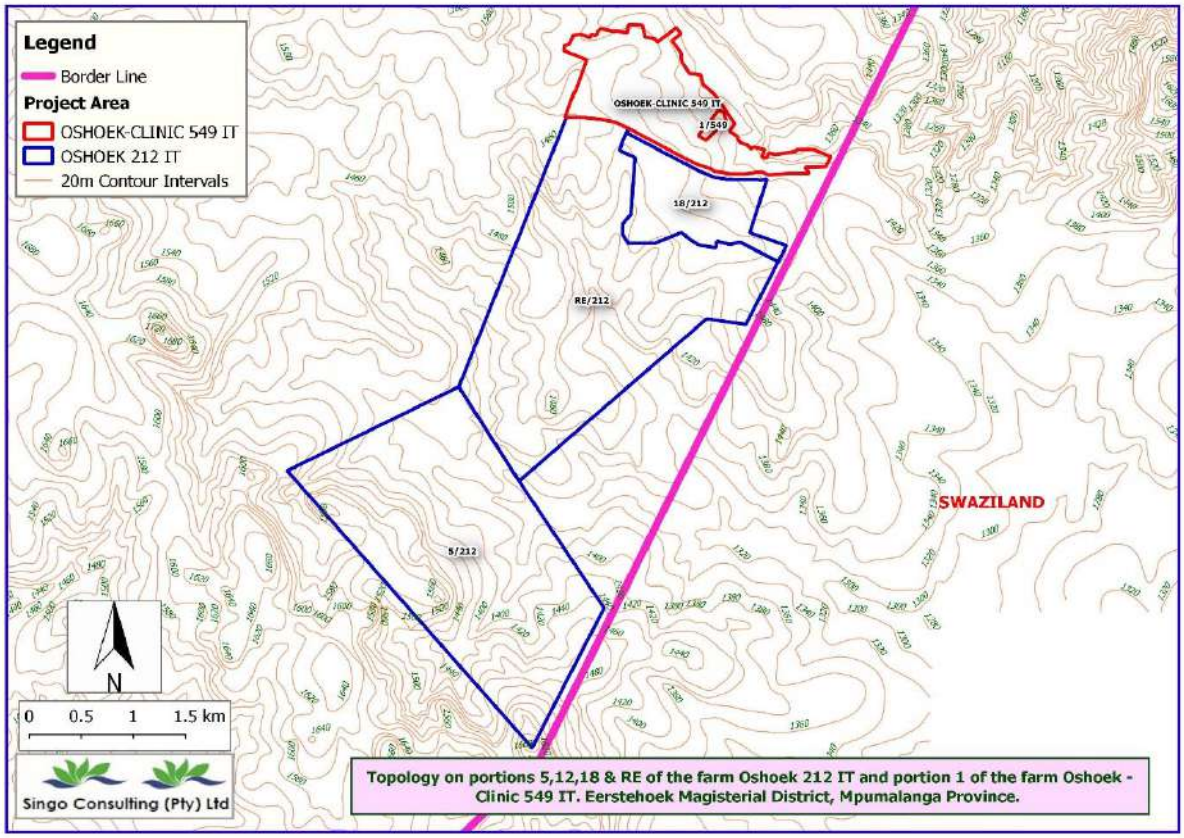
TDP. 2017. The Eskom Transmission Development Plan 2018 to 2027. http://www.eskom.co.za/Whatweredoing/TransmissionDevelopmentPlan/Pages/Transmission_Development_Plans.aspx

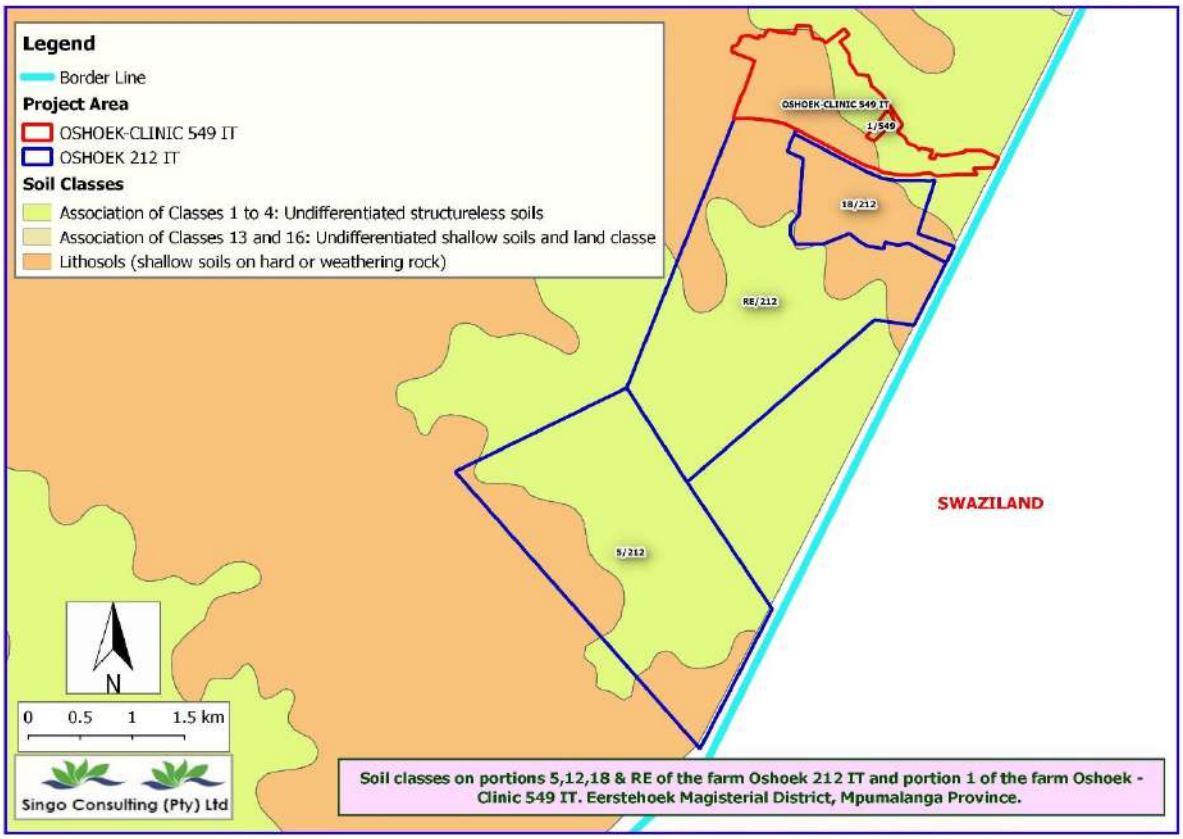
APPENDIX A: EAP'S DETAILS

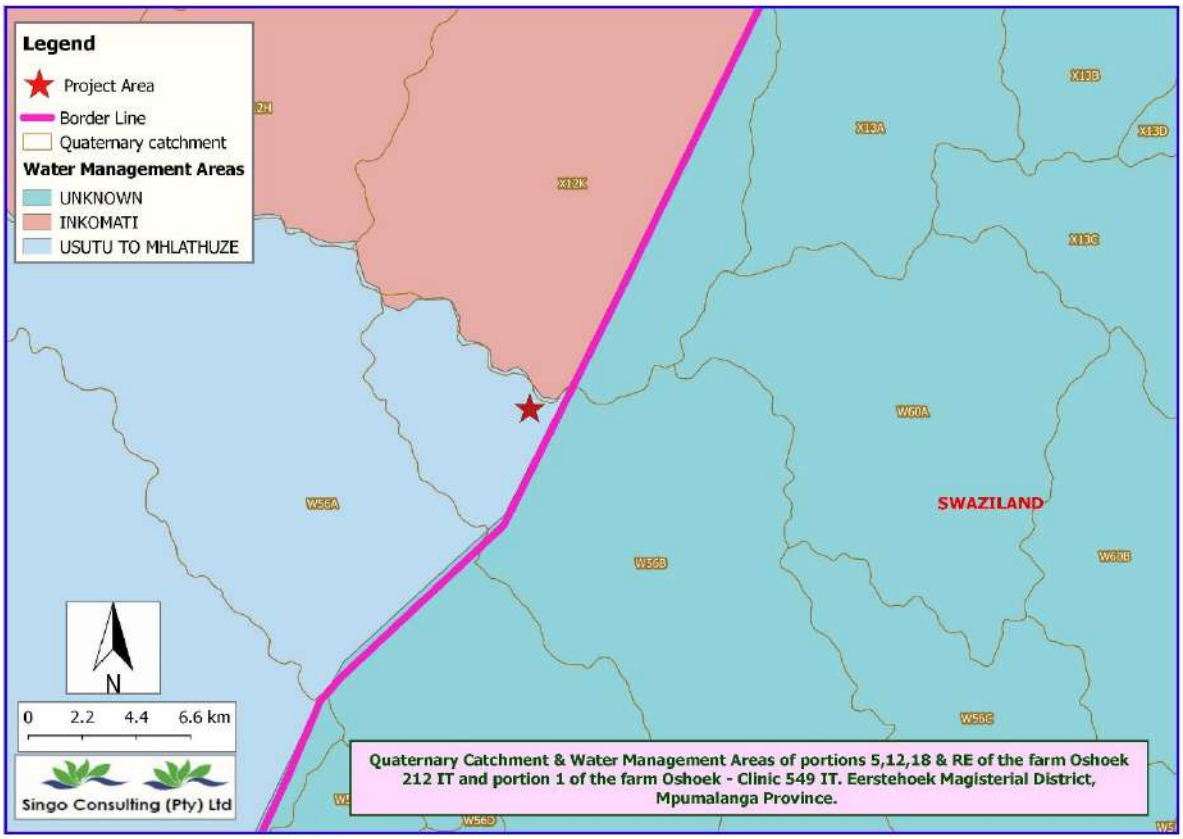
APPENDIX B: CONSULTATION REPORT

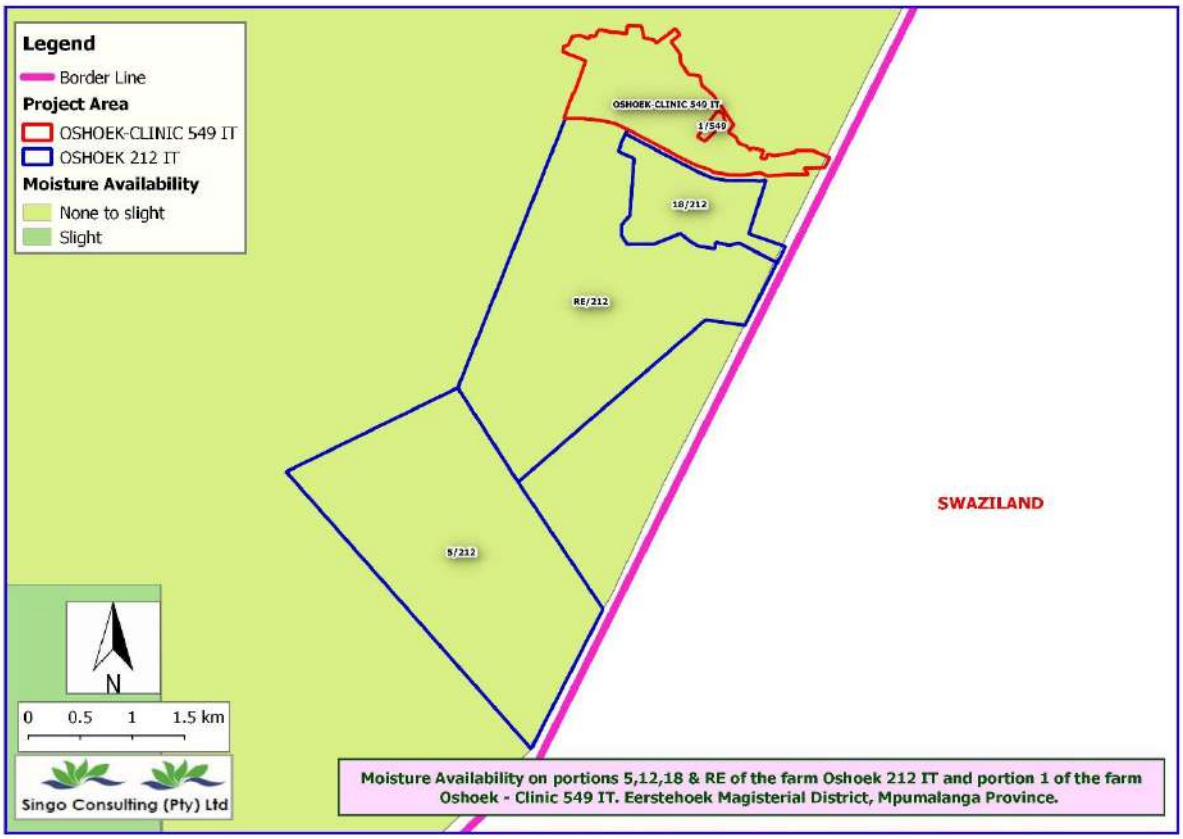
APPENDIX C: SENSITIVITY MAPS

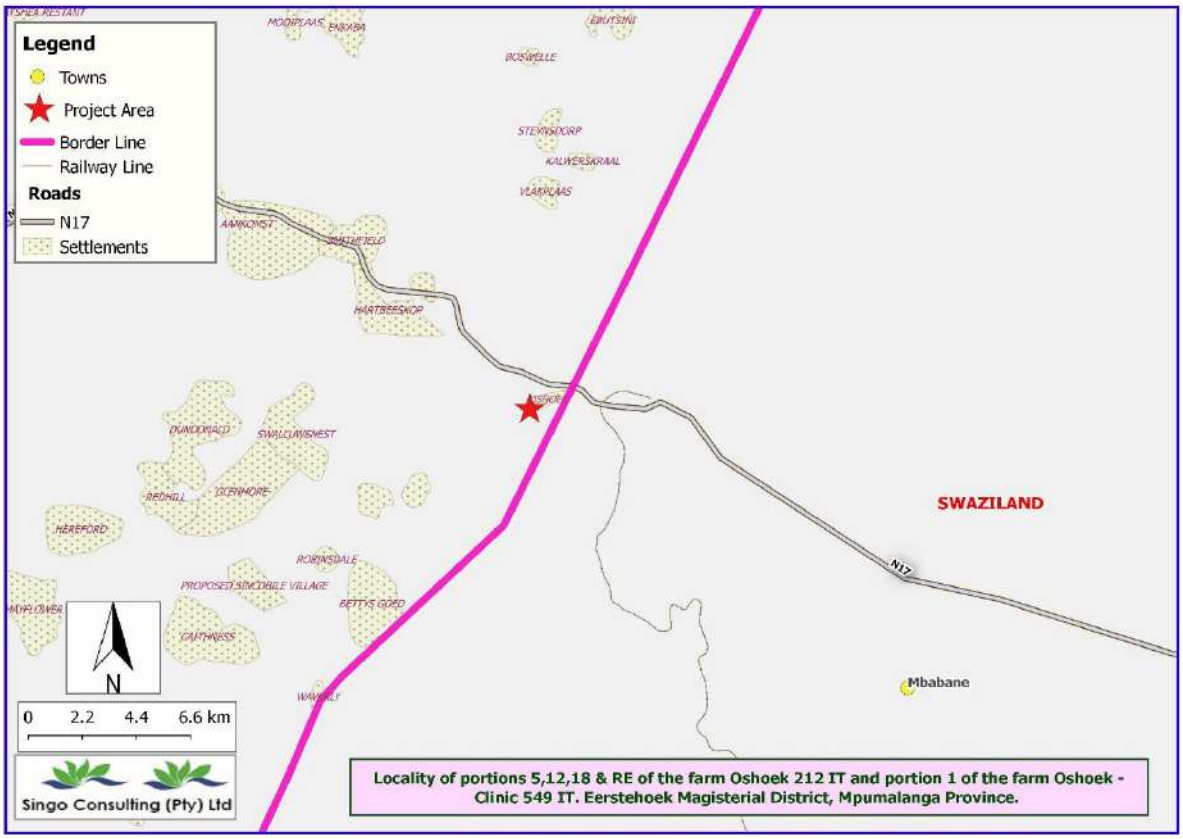


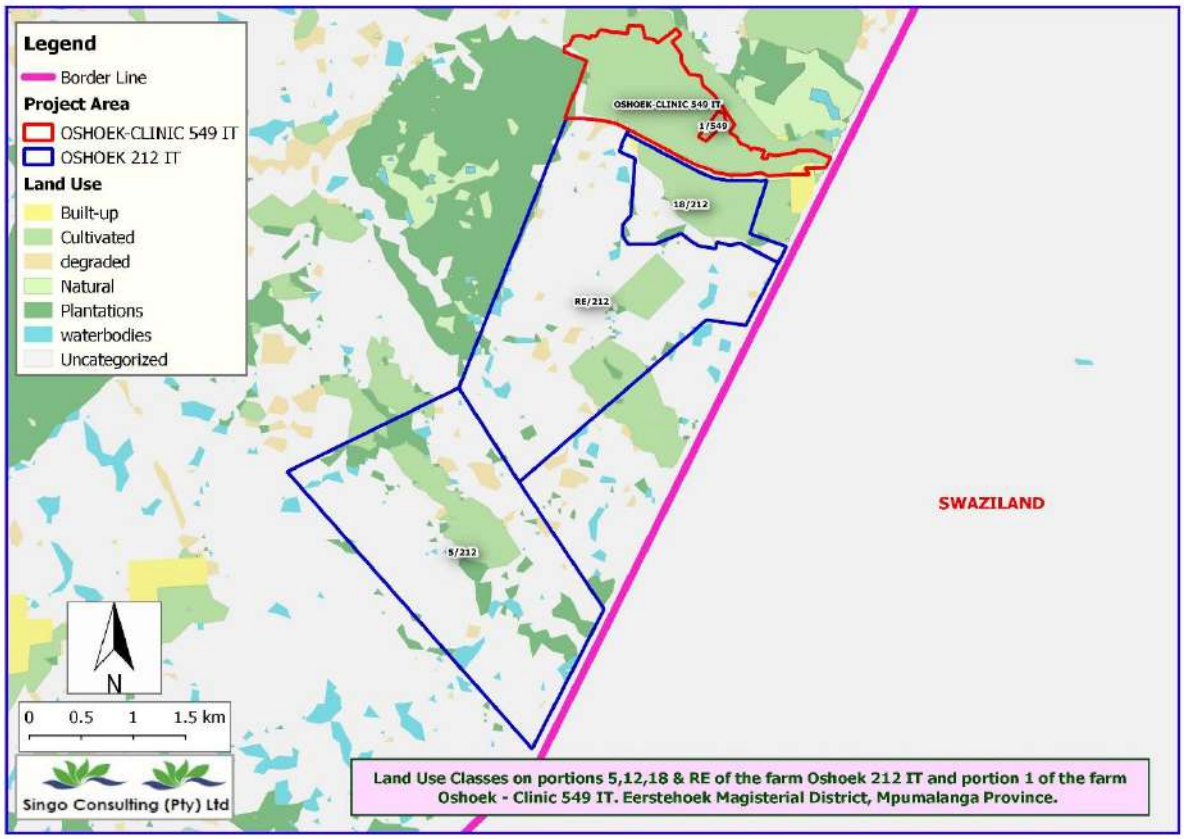


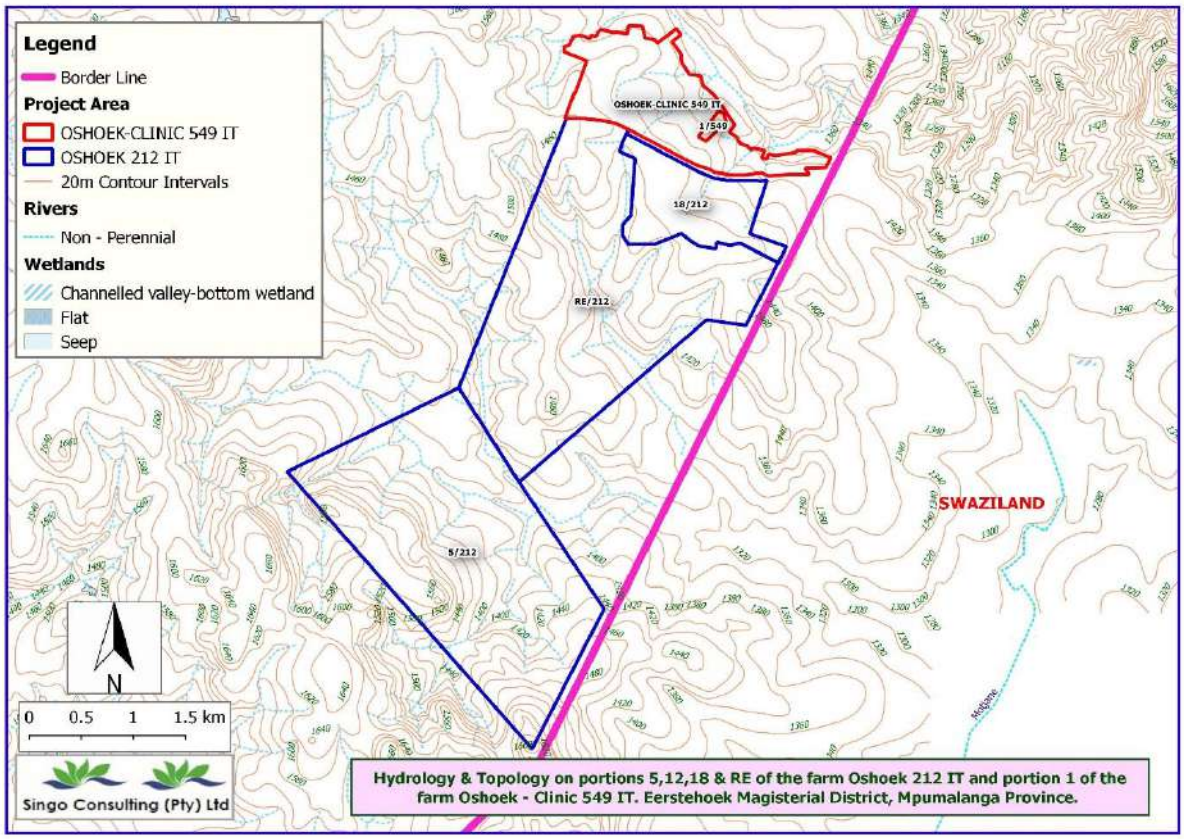

Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Soil Classes
Association of Classes 1 to 4: Undifferentiated structureless soils
Association of Classes 13 and 16: Undifferentiated shallow soils and land classe
Lithosols (shallow soils on hard or weathering rock)
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Soil classes on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.

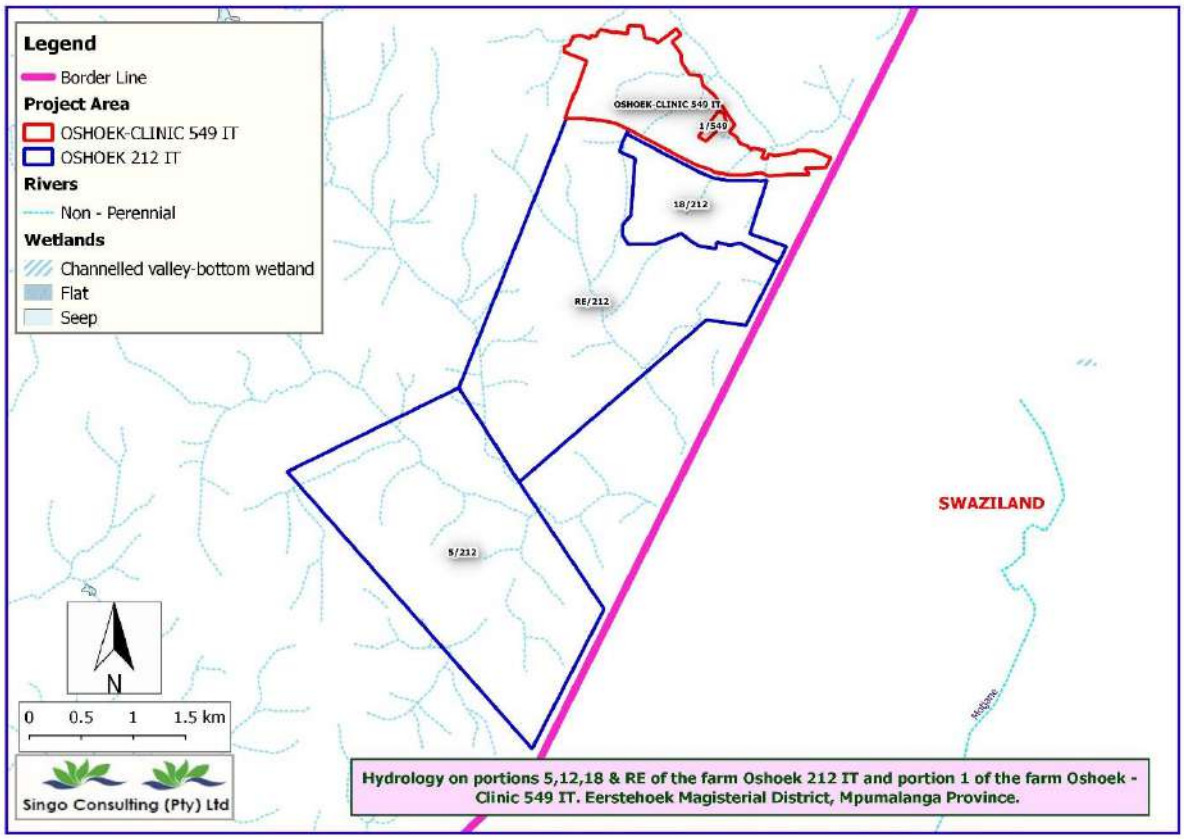

Legend
Project Area
Border Line
Quaternary catchment
Water Management Areas
UNKNOWN
INKOMATI
USUTU TO MHLATHUZE
X13B
X13A
X13D
X12K
X13C
W60A
W56A
SWAZILAND
W56B
W60B
W56C
N
0 2.2 4.4 6.6 km
Singo Consulting (Pty) Ltd
Quaternary Catchment & Water Management Areas of portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.

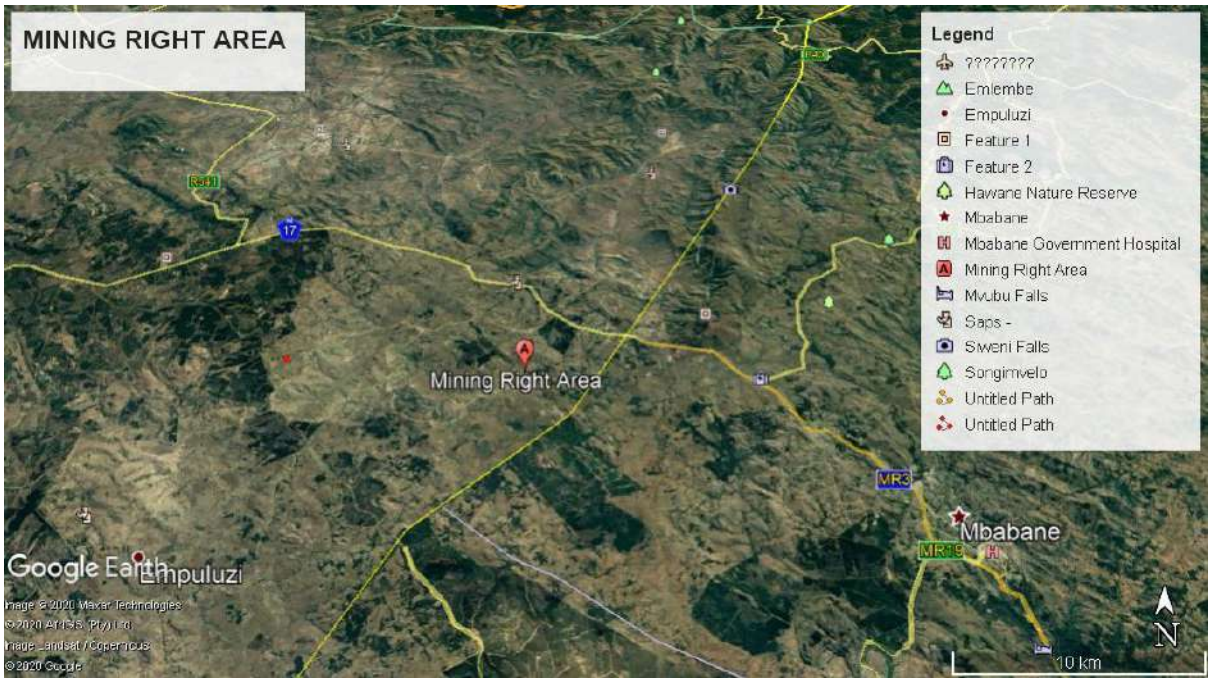

Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Moisture Availability
None to slight
Slight
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Moisture Availability on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.

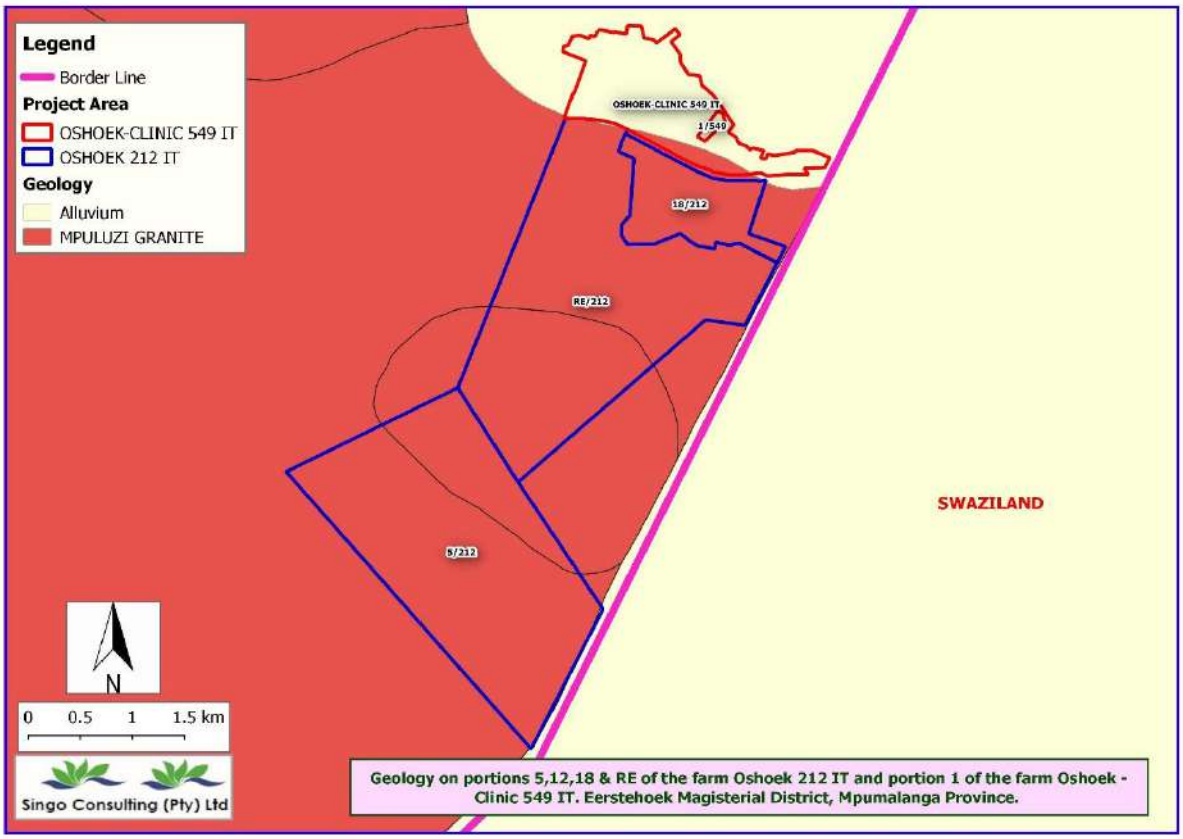

Legend
Towns
Project Area
Border Line
Railway Line
Roads
N17
Settlements
MOOIPLAAS
ENKABA
BOSWELLE
STENVISDORP
KALWERSKRAAL
VLAKPLAAS
AANKOMST
HARTBEESKOP
SWALOWSNEST
REDHILL
HEREFORD
ROBINSDALE
BETTYS GOED
WAVERLY
SWAZILAND
N17
Mbabane
N
0 2.2 4.4 6.6 km
Singo Consulting (Pty) Ltd
Locality of portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.

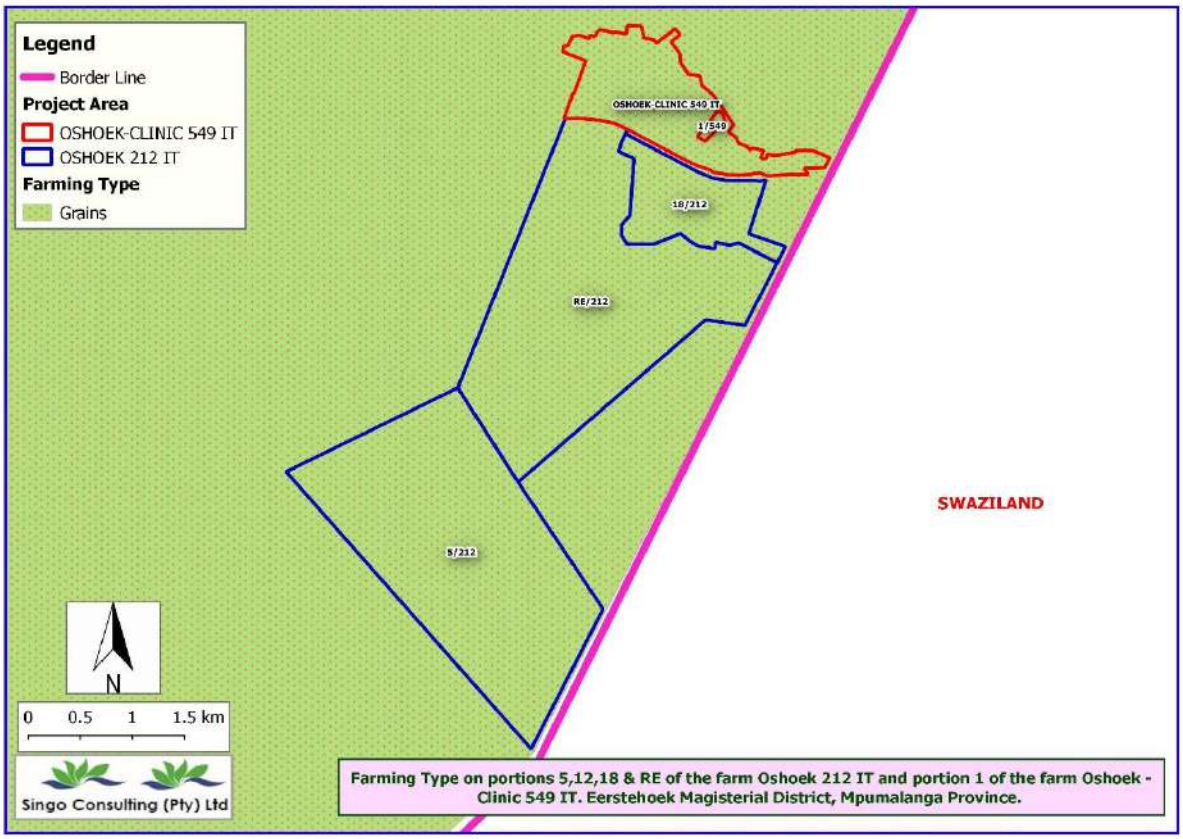

Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Land Use
Built-up
Cultivated
degraded
Natural
Plantations
waterbodies
Uncategorized
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Land Use Classes on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.

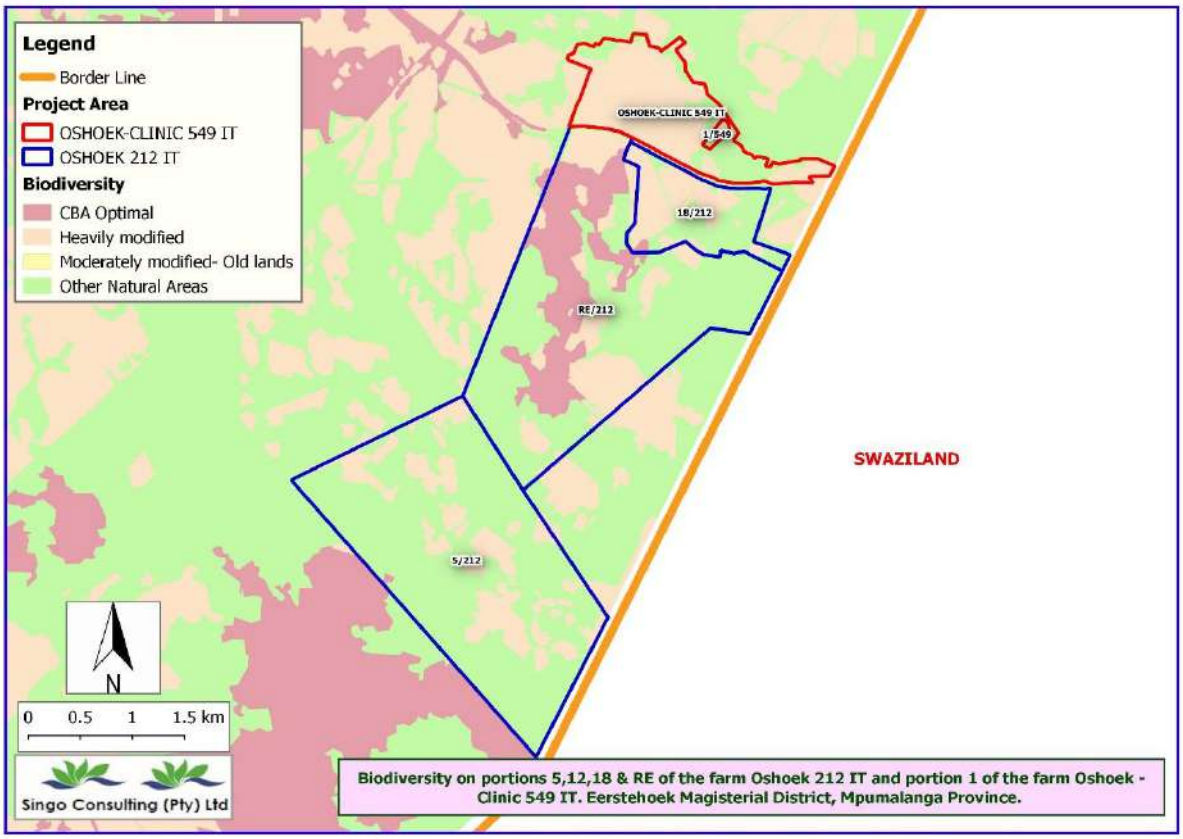

Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
20m Contour Intervals
Rivers
Non - Perennial
Wetlands
Channelled valley-bottom wetland
Flat
Seep
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Hydrology & Topology on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.

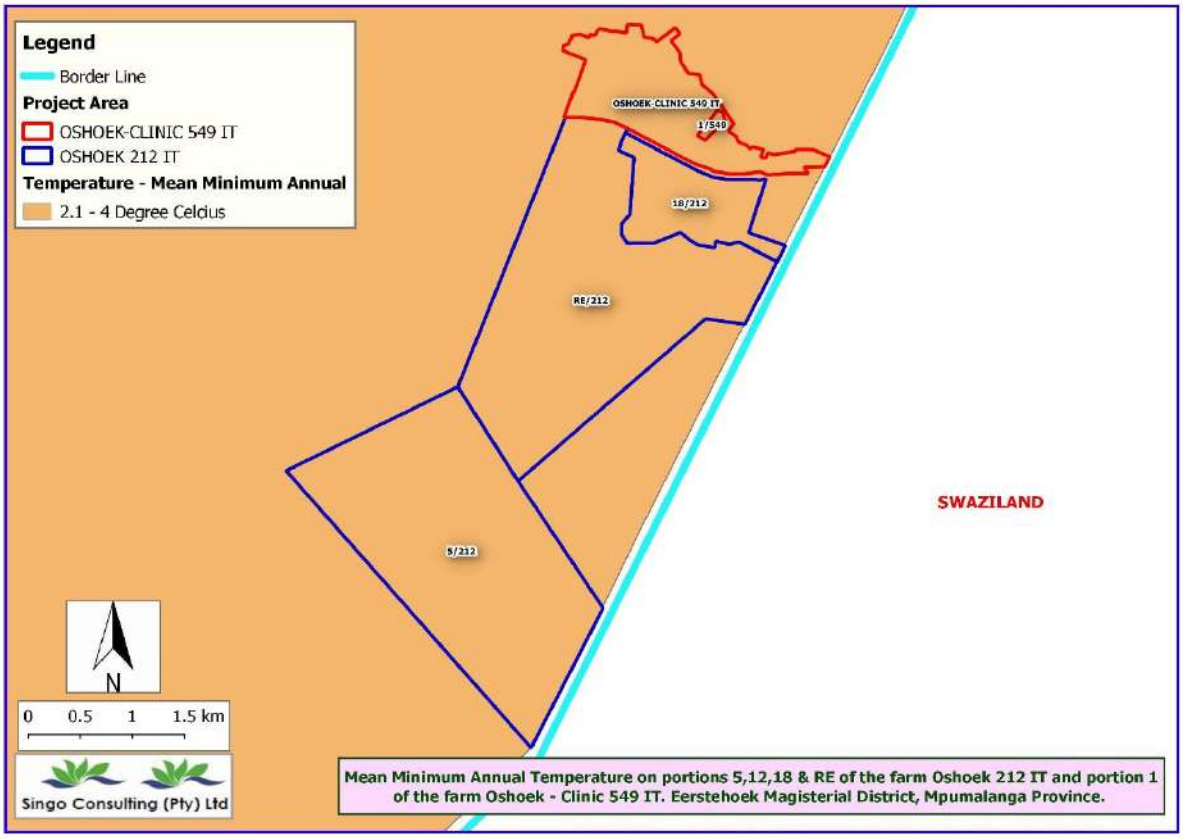

Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Rivers
Non - Perennial
Wetlands
Channelled valley-bottom wetland
Flat
Seep
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Hydrology on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.

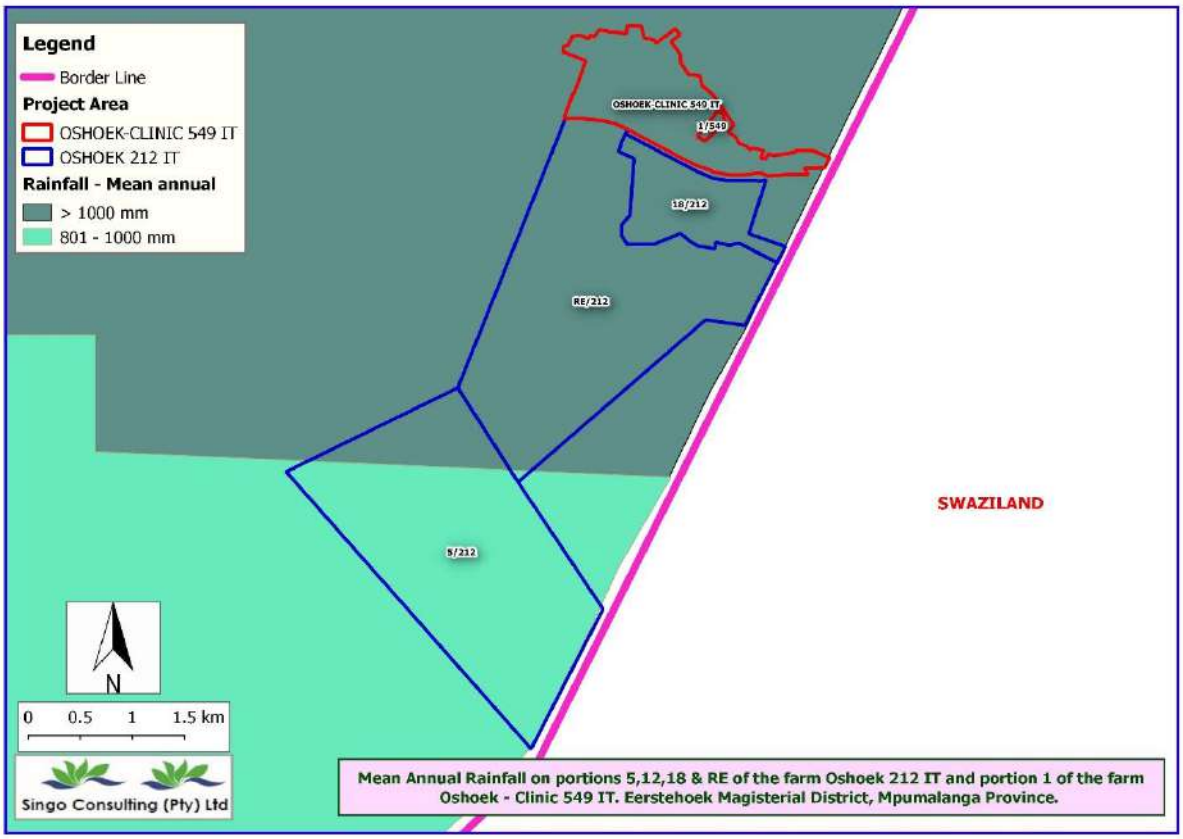

MINING RIGHT AREA
Legend
????????
Emlembe
Empuluzi
Feature 1
Feature 2
Hawane Nature Reserve
Mbabane
Mbabane Government Hospital
Mining Right Area
Mvubu Falls
Saps -
Siweni Falls
Songimvelo
Untitled Path
Untitled Path
Mining Right Area
Mbabane
Empuluzi
Google Earth
10 km
N


Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Geology
Alluvium
MPULUZI GRANITE
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Geology on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.


Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Farming Type
Grains
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Farming Type on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.


Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Biodiversity
CBA Optimal
Heavily modified
Moderately modified- Old lands
Other Natural Areas
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Biodiversity on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.


Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Temperature - Mean Minimum Annual
2.1 - 4 Degree Celcius
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Mean Minimum Annual Temperature on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.


Legend
Border Line
Project Area
OSHOEK-CLINIC 549 IT
OSHOEK 212 IT
Rainfall - Mean annual
> 1000 mm
801 - 1000 mm
OSHOEK-CLINIC 549 IT
1/549
18/212
RE/212
5/212
SWAZILAND
N
0 0.5 1 1.5 km
Singo Consulting (Pty) Ltd
Mean Annual Rainfall on portions 5,12,18 & RE of the farm Oshoek 212 IT and portion 1 of the farm Oshoek - Clinic 549 IT. Eerstehoek Magisterial District, Mpumalanga Province.