FINAL SCOPING REPORT FOR MATAI MINING (PTY) LTD MINING RIGHT APPLICATION FOR VANADIUM, TITUNIUM AND IRON ORE ON THE FARMS WILDEBEESTKUIL 7 JQ, AND PORTIONS OF FARMS MAGAZYNSKRAAL 3 JQ, HAAKDOORN 6 JQ, SYFERKUIL 9 JQ, MIDDELKUIL 8 JQ WITHIN THE MAGISTERIAL DISTRICT OF MANKWE, NORTH WEST PROVINCE

NOVEMBER 2022

DMR REFERENCE NUMBER: NW 30/5/1/2/2/10207MR

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NORTH WEST PROVINCE

Conducted on behalf of:

Matai Mining (Pty) Ltd

Compiled by:

Lufuno Nengwani

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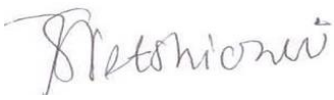

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Simon Netshiozwi

Document History and Distribution List

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Name	Institution
Matai Mining (Pty) Ltd	Matai Mining (Pty) Ltd
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ABBREVIATIONS AND ACRONYMS

%	Percent
°C	Degrees Celsius
<	Less than
>	Greater than
AMD	Acid Mine Drainage
BBKTA	Bakgatla-Ba-Kgafela Tribal Authority
BID	Background Information Document
BPDM	Bojanala Platinum District Municipality
CARA	Conservation of Agricultural Resources Act
cm	Centimetre
CR	Critically Rare
CSI	Corporate Social Investment
CSR	Corporate Social Responsibility
dB	Decibel
dBA	Decibels (Weighted)
DEA	Department of Environmental Affairs
DM	District Municipality
DMR	Department of Mineral Resources
DMS	Dense Medium Separation
DSO	Direct Shipping Ore
DWS	Department of Water and Sanitation

EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity analysis
EMP	Environmental Management Plan/Programme
EN	Endangered
ESR	Environmental Scoping Report
Fax	Facsimile
GDP	Gross Domestic Product
Ha	Hectare
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
IRR	Issues and Response Register
IWUL	Integrated Water Use License
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
LED	Local Economic Development
LM	Local Municipality
LOM	Life of Mine
m	Metres

m^2	Square Meters
m^3	Cubic Metres
masl	Metres Above Sea Level
MKLM	Moses Kotane Local Municipality
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NEM: WA	National Environmental Management: Waste Act
NT	Near Threatened
NWA	National Water Act (Act No. 36 of 1998)
NWP	North West Province
PCD	Pollution Control Dam
PES	Present Ecological State
PPP	Public Participation Process
ROM	Run of Mine
S&EIR	Scoping and Environmental Impact Report
SAHRA	South African Heritage Resource Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SANS 10103	South African National Standard 10103
SAWS	South African Weather Service

SDF	Strategic Development Framework
SLP	Social and Labour Plan
sms	Short Message Services
SWMP	Storm-water Management Plan
t	Tonne
WMA	Water Management Area
WULA	Water Use License Application

EXECUTIVE SUMMARY

Introduction

Matai Mining (Pty) Ltd (Matai Mining) holds the Prospecting Right that was granted in terms of the Mineral and Petroleum Resources Development Act 28 of 2002 as amended by Act 49 of 2008 ("MPRDA"). Matai Mining herewith apply for a Mining right for Vanadium, Titanium and Iron Ore in terms of the Section 23 (a), (b) and (c) read together with regulation 11(1) (g) of the MPRDA (ACT 28 of 2002).

Contact Person and Correspondence Address

This scoping report set out the proposed scope of the Environmental Impact assessment (EIA) that will be conducted. This document therefore will discuss a range of aspects to mention the details of the appointed Environmental Assessment Practitioner (EAP), his qualifications and a summary of his experience.

Description of the Property.

The Matai project is located in the Northwest Province within the Mankwe Magisterial District. The mining right is on farm Wildebeestkuil 7 JQ, and certain portions of these farms Magazynskraal 3 JQ, Haakdoorn 6 JQ, Syferkuil 9 JQ and Middelkuil 8 JQ. A locality map of the proposed project area is included as Figure 1, the immediate adjacent land owners to the proposed project are summarised and tabulated.

Description of the Scope of the Proposed Overall Activity.

The proposed activity might trigger the following listing activities, GNR 983 (Activity 13), GNR 983 (Activity 14), GNR 983 (Activity 24 (ii)), GNR 984 (Activity 9), GNR 984 (Activity 15), GNR 984 (Activity 17), GNR 984 (Activity 21), GNR 985 Activity 10 (f), GNR 985 (Activity 12 (a)), GNR 178 Category B (Activity 10), GNR 178 Category B (Activity 11).

The proposed activities that Matai Mining is intending to undertake will include the excavation of an open cast mine. Datamine software was chosen to design the pit for the mine, to ensure that all waste within the ultimate pit can be accommodated throughout the life of Mine (LOM), a Waste Dump Design was completed. Apron Feeders will be utilised, as they deliver material at a uniform rate, which allows an optimal feeding to downstream equipment. Crushers will be used to reduce

large rocks into smaller rocks, gravel, or rock dust. Conveyors will be used to transport material such as the ore and the overburden. It is assumed the water supply for the plant area will be obtained from the Municipal and other nearby water sources. The power supply will be supplied by Eskom. Gravel Surface roads will be constructed. For the purpose of administration, general buildings will be built. The Site Layout is presented in Figure 7.

Policy and legislative context

Several legislations and guidelines were used to compile this Scoping Report. However, there are not limited to the followings;

Constitution of the Republic of South Africa, 1996 (Act 108 of 1996),

National Environmental Management Act (Act 107 of 1998) (NEMA). The Environmental Impact Assessment Regulation GNR. 982 dated 04 December 2014 as amended in April 2017,

Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), Occupational Health and Safety Act (No. 85 of 1993),

National Water Act (Act 36 of 1998) (NWA),

National Environmental Management Waste (No 59 of 2008) (NEM: WA),

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

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

National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003 as amended), Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) (CARA),

Restitution of Land Rights Act, 1994, Land Reform (Labour Tenants) Act, 1996 and the Extension of Security of Tenure Act, 1997,

National Heritage Resources Act (Act 25 of 1999),

Promotion of Access to Information Act, 2000 (Act 2 of 2000 as amended),

National Development Plan (NDP),

Bojanala Platinum District Municipality (BPDM) Integrated Development Plan (IDP) (2018/2022),

Moses Kotane Local Municipality (MKLM) Integrated Development Plan (IDP) (2021/22),

Environmental Management Frameworks (BPDM) and Environmental Management Frameworks (MKLM),

Spatial Development Framework (MKLM).

Need and Desirability of the Proposed Activities.

This Chapter focuses on the positive impacts that this proposed project will contribute to the communities and the country. Amongst other benefits, employment opportunities will be created, growth in the Gross Domestic Product (GDP), poverty alleviation and the minerals to be mined have a significate economic benefits to the industry.

Description of the process followed to reach the proposed preferred site.

The preferred activity is the mining of Vanadium, Titanium and Iron Ore and it will be extracted through open cast mining method. The selected site layout is represented in Figure 7, the selection was based on the position and of the mineral reserves to be exploited, land ownership, geo-hydrological impacts and the ease and available transport modes and routes. The ore will be mined from an open pit using excavators, bulldozers, trucks, bowl scraper and shovel. A tripper conveyor is proposed for the stacking method. The proposed technologies were based on their long-term success in terms of mining history, therefore no alternatives are indicated.

The operation aspects of the proposed mining involve the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations, access roads, diesel and wash bays. No feasible alternative operational aspect methods currently exist. The No-go option might be considered if the mining right application is rejected however, the applicant will loss the opportunity to utilise the reserves and the agricultural activity will continue.

Details of the public participation process followed

The Public Participation Process (PPP) was conducted to inform the Interested and Affected Parties (I&APs) of the proposed project and they were encouraged to be part of the process. I&APs will continuously be captured on a database. Pre- consultation meeting were conducted in

affected villages. The Background Information Documents (BIDs) were distributed, newspaper advertisement was placed in the Platinum Bushvelder in English and the site notices were placed. The Draft scoping report was distributed to all registered I&APs and state organs for review and comments. The I&APs will immediately be notified on the Competent Authority's decision about granting or rejecting the proposed project and they will be given the opportunity to appeal on the decision.

The Environmental Attributes Associated with the sites

Bakgatla-Ba- Kgafela Traditional Authority (BBKTA) is the traditional Authority that is responsible for the administrative tasks at a community level within the project area. The project is within Moses Kotane Local Municipality. Demographic profile of the affected area was assessed, which includes the population and growth trends, household size and composition, employment and income and health.

The biophysical environment that was discussed in the Chapter includes the Climate, Air quality, Noise, Blasting and Vibration, Traffic, Geology, Geohydrological setting, Topography, Soils, Heritage and Paleontology, Visual Baseline and Biodiversity.

Description of Specific Environmental Features and Infrastructure on the site

This chapter discusses the present infrastructure that is available at the proposed mining area. The infrastructure includes the gravel roads, reservoirs, rails and water pipelines. The land uses were also highlighted which involves mining, rural communities, grazing areas and some portions of cultivated land.

Impacts identified

In this Chapter the anticipated impacts are assessed on a range of biophysical and socio-economic aspects of the environment. The purpose of the Scoping phase is to identify and evaluate the significance of these potential impacts and to determine on how they can be minimised or mitigated.

Methodology used in Determining the Significance of Environmental Impacts

The focus is on the methodology that is used to identify the significance of the impact. This was done by determining the extent and duration of the impact. The formula used is as follows;

Extent + Duration + Intensity= High/Medium/Low Impact

Advantages and disadvantages of open cast mining on the environment and community were compared with those of underground mining and the No- go option. The advantages of the layout, technology and operation alternatives were highlighted; presently no disadvantages and other alternatives were identified. The mitigation measures that could be applied were further discussed and their level of risk.

The Outcome of the Site Selection Matrix. Final Site Layout Plan

The selected site plan is represented in Figure 7.

Motivation where no alternative sites were considered

The proposed site was selected based on the presence of the minerals proposed to be mined, land ownership, Geo-hydrological impacts and the availability of transport modes and routes. If the Mining Right is not granted the only feasible alternative is the No go option.

Plan of Study for the Environmental Impact Assessment Process

In the EIA process the selected activity is the Open cast mining for Vanadium, titanium and iron ore. The site alternative selected is shown in Figure 7 and no alternative for the layout was considered. Excavator, bulldozers, trucks, bowl scraper, shovel, crushers and conveyors will be the preferred technology that will be employed, no other technology alternatives were considered. The proposed mining operation will involve the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations, access roads diesel and wash bays. In case the mining right is not being granted, the No-go option might be considered.

Description of the aspects to be assessed as part of the Environmental Impact Assessment Process

As part of the EIA, the aspects and specialist studies that will be assessed will include;

Evironmental Aspect	Specialist Studies
Soil	Soil and land capability

Evironmental Aspect	Specialist Studies
Flora and Fauna	Ecological Studies (Biodiversity included)
Surface Water and Wetland	Surface water and Wetland impact assessment
Ground Water	Geohydrological Investigations
Air Quality	Air Quality Assessment
Noise	Noise Assessment Study
Visual	Visual impact assessment
Cultural and Heritage Aspects	Heritage and Archaeological Assessment Study
Socio-economic aspects	Socio-Economic Studies
Traffic	Traffic impact assessment
Blasting and vibration	Blasting and vibration specialist

Proposed method of assessing the Environmental Aspects including the Proposed Method of assessing alternatives

The method of assessing the existing, direct, No- go option, cumulative impacts were discussed.

Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored

Measures to mitigate the identified impacts were provided and the extent of the residual risks which needs to be managed was determined.

Other information required by the competent authority

At the present moment, no specific information has been requested by the Competent Authority.

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

The positive and negative of the socio-economic impacts associated with the proposed development were highlighted.

Impact on any National Estate referred to in Section 3(2) of the National Heritage Resources Act.

The information will be attached after the Heritage Impact Assessment has been conducted

Other matters required in terms of Sections 24(4)(a) and (b) of the act.

There is no project alternative that was considered for the Matai Mining project rather than the mining.

Undertaking regarding correctness of information

The EAP confirms that the information provided is correct.

Undertaking regarding level of agreement

The EAP must confirm that the level of agreement with interested and Affected Parties and stakeholders will be correctly recorded and reported in the Scoping Report.

References

All sources of information that was used to compile this Scoping report have been acknowledged.

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1 INTRODUCTION

Matai Mining is the holder of the prospecting right NW 30/5/1/1/2/11277 PR granted and issued in terms of Section 11(1) of the Mineral and Petroleum Resources Development Act 28 of 2002 as amended by Act 49 of 2008 ("MPRDA"). The primary right NW 30/5/1/1/2/2679 PR was originally granted to Rise Africa Mining and Exploration (Pty) Ltd on the 06 December 2011, which remained in force up until 05 December 2013. Rise Africa Mining and Exploration (Pty) Ltd applied in terms of section 102 of the MPRDA to amend the granted right to include iron ore and titanium, the application was granted on the 8th of September 2013. Rise Africa Mining and Exploration (Pty) Ltd applied for renewal of the right on the 18th of October 2013 and was granted on the 26th of August 2015, with reference number: NW 30/5/1/1/2/11277 PR. Rise Africa Mining and Exploration (Pty) Ltd applied for ministerial consent in terms of section 11 of the MPRDA of 2002, to cede the same right in favour of Matai Mining the consent was approved on the 3rd of November 2014. Matai Mining at the time owned by Yanbing Zhang -74% and Jayamma Zhang 26%. Matai Mining applied for ministerial consent in terms of section 11 of the MPRDA to have change in the shareholding by disposing all shares owned by Yangbing Zhang and transfer them to Camp Brave Limited; and consent was approved on the 09th of November 2015. Matai Mining hereby apply for a Mining right in terms of the Section 23 (a), (b) and (c) read together with regulation 11(1) (g) of the MPRDA (ACT 28 of 2002).

The applicant must apply to the competent authority, Department of Mineral Resources for approval to proceed with the mining development. This document constitutes the Final Scoping report, which forms part of the EIA process. After the scoping phase, specialist studies applicable to the project will be undertaken to investigate the potential impacts that may result from the proposed project and to formulate appropriate mitigation measures.

1.1 Project Location

The Matai Mining Project is located in the Moses Kotane Municipality, Bojanala Platinum District Municipality, North West Province, South Africa. It lies about 10km south from the closest town Northam, approximately, 80km north east of Rustenburg and 220km north west of Johannesburg, between the Pilanesberg Nature Reserve in the south (approx. 8km from the project), Pilanesberg Mines in the west (approx. 8km from the project) and Siyanda Resources Union Mine in the north (approx. 5km from the project). The project is approximately centred on Geographic coordinates Latitude 25° 00′ 00" S, Longitude 27° 10′ 00" E.

Matai Mining is applying for a mining right on the farms, certain portion of farm Magazynskraal 3 JQ, certain portion of farm Haakdoorn 6 JQ, the farm Wildebeeskuil 7 JQ, certain portion of the remaining extent of portion 1, certain portion of the remaining extent of portion 2, certain portion of the remaining extent of portion 5, certain portion of 6, portions 11, 12 and 13 (portion of portion 2) and certain portion of the remaining extent of the farm Syferkuil 9 JQ, the remaining extent of portion 1, portion 2, portion 3 (a portion of portion 1), the remaining extent of the farm Middelkuil 8 JQ.

1.2 NEMA Public Participation Process

Public Participation Process (PPP) was undertaken with the intent of informing key local communities (directly affected people) about the proposed development and the scoping process underway. Public participation plays an important role in the compilation of environmental reports as well as the planning, design and ultimately the implementation of the project.

This scoping report sets out the proposed scope of the Environmental Impact assessment (EIA) that will be undertaken for the proposed mine. This includes the range of the alternatives that will be evaluated for various aspects of the project, the key environmental impacts and issues that need to be addressed, the specialist studies that will be undertaken, terms of reference of the specialist studies and the qualifications and experience of the study team.

2 CONTACT PERSON AND CORRESPONDENCE ADDRESS

2.1 Details of The EAP who prepared the report

Name of the Practitioner:

Name And Surname	Lufuno Nengwani
Name Of Company	Kimopax Pty Ltd
Telphone Number	011 312 9765
Fax Number	011 312 9768
Email Address	Lufuno@kimopax.com

2.2 Expertise of the EAP.

2.2.1 Expertise of Charles Chigurah

a) The qualifications of the EAP

(With evidence attached as Appendix A)

B.Sc. Hons. Geography and Environmental Studies Post Graduate Diploma in Water Supply and Sanitation

b) Summary of the EAP's past experience.

(Attach the EAP's curriculum vitae as *Error! Reference source not found.**)***

Charles Chigurah holds an honours degree in Environmental Management from the Midlands State University in Zimbabwe. Postgraduate Diploma in Water Supply and Sanitation from the Institute of Water Supply, Sanitation and Development in Zimbabwe. He holds SAMTRAC and he is currently finalizing his NEBOSH International Diploma in Occupational Safety and Health. He is a Senior SHE Consultant and a member of International Association of Impact Assessors (IAIA), South African Council for Natural Scientific Professions (SACNASP). Charles is a member of Institute of Waste Management in Southern Africa (IWMSA) and he is registered with the South African Council for Project and Construction Management Professions (SACPCMP) as a Construction Health and Safety Manager (CHSM). He has more than 9 years working experience in the field of Construction, Waste Management, Environmental Management and Environmental Management Systems (EMS) Implementation and Auditing and has published a paper in Geographical Information Systems (GIS) and Remote Sensing. He has worked on a number of municipality projects and herewith is selected few completed projects:

a) Integrated Waste Management Plan for Nkonkobe Local Municipality

b) Integrated Waste Management Plan for Tokologo Local Municipality

c) Integrated Environmental Management Plan for Xhariep District Municipality

d) Environmental Management Framework for Amajuba District Municipality

e) Integrated Waste Management Plan for Tubatse-Fetakgomo Local Municipality

Apart from doing municipality projects, Charles has also managed more than fifty (50) Environmental Impact Assessment Projects both in Zimbabwe and South Africa. He has also worked as a Construction SHE Advisor and Consultant on a number of major construction projects across South Africa, among them include the construction of multi-storey buildings in Mpumalanga and Limpopo Provinces; the construction of gas pipelines for Sasol in Gauteng, the construction and upgrades of road networks in Limpopo Province as well the construction and upgrades of Bulk Water and Sewer Systems for Ekurhuleni Metropolitan Municipality and was also a Safety Advisor for Eskom Hendrina Power Station responsible for managing sub-contractor's safety officers.

2.2.2 Expertise of Lufuno Nengwani

c) The qualifications of the EAP

(With evidence attached as Appendix A)

B.E.Sc. Hons. Mining and Environmental Geology Diploma in Mining Engineering

d) Summary of the EAP's past experience.

(Attach the EAP's curriculum vitae as *Error! Reference source not found.**)***

Mr Nengwani has completed the various Environmental Management modules such as Ecological Principles for Environmental Management, The Natural Environment as a System, Pollution and Environmental Quality; Environmental Geology and Mine Rehabilitation; Environmental Impact Assessment and Modelling; Resource Evaluation and Information System; GIS and Map Production; and Advanced Mining and Environmental Management

He has over 5 years of working experience in the environmental management field obtained from Geoluken Consulting, Crysbol, and Multiview Investments which are an environmental consulting companies. My expertise is ranging from conducting applications for Environmental Authorisations (mining and developmental projects), Water Use License applications, Waste Management Applications, performance assessment reports for operational mines, and water sampling. Supervisory duties within the field, Environmental reports, progress report writing and proposals, including Environmental

Management Plans/Programmes, handling of the Department of Mineral Resources (DMR) documents in general.

3 DESCRIPTION OF THE PROPERTY.

Table 1: Details of properties under the application

Farm Name:	a) Certain portion of Magazynskraal 3 JQ, b) Certain portion of Haakdoorn 6 JQ, c) Farm Wildebeestkuil 7 JQ, d) Certain portions of remaining extents of portion 1, 2 and 5, certain portion of portion 6, portions 11, 12, and 13 (portions of portion 2), certain portion of the remaining extent of the farm Syferkuil 9 JQ, e) Remaining extent of portion 1, portion 2, portion 3 (a portion of portion 1) and the remaining extent of the farm Middelkuil 8 JQ.
Application area (Ha)	9836.6652 Ha
Magisterial district:	Mankwe Magisterial District
Distance and direction from nearest town	Approximately 80km North East of Rustenburg (North West Province) and 10 km South of Northam
21digit Surveyor General Code for each farm portion	**Middelkuil 8JQ** Remaining Extent T0JQ00000000000800000 Portion 1 T0JQ00000000000800001 Portion 2 T0JQ00000000000800002

	Portion 3	T0JQ00000000000800003
	Wildebeestkuil 7JQ	T0JQ00000000000700000
	Haakdoorn 6JQ	T0JQ00000000000600000
	Magazynskraal 3JQ	T0JQ00000000000300000
	Syferkuil 9JQ	
	Remaining Extent	T0JQ00000000000900000
	Portion 1 (RE)	T0JQ00000000000900001
	Portion 2 (RE)	T0JQ00000000000900002
	Portion 5 (RE)	T0JQ00000000000900005
	Portion 6	T0JQ00000000000900006
	Portion 11	T0JQ00000000000900011
	Portion 12	T0JQ00000000000900012
	Portion 13	T0JQ00000000000900013

Land tenure and use of immediately adjacent land

The owners of the farm portions immediately adjacent to the Matai Mining site are listed in the

Error! Not a valid bookmark self-reference.? below. The adjacent land is mostly used for agricultural activities.

Table 2: Adjacent land owners of the site

Farm name	Portion number	Full names of owner	Title Deed Number	Contact details and address
Haakdoorn 6 JQ	Portion 6	National Government Republic of South Africa	T5990/1937BP	N/A
Wildebeestkuil 7 JQ	Portion 7	No Information available	-	
Magazynskraal 3 JQ	Full Farm	National Government Republic of South Africa	T34032/1946BP	N/A
Syferkuil 9 JQ	Portion 0	S A Native Trust	T5780/1937BP	N/A
	Portion 1	Republic of Bophuthatswana	T6932/1937BP	N/A
			T454/1979BP	
			T6933/1937BP	
			T455/1979BP	
	Portion 2	SA Native Trust	T5780/1937BP	N/A
		Evraz Highveld Steel & Vanadium Ltd	-	

Farm name	Portion number	Full names of owner	Title Deed Number	Contact details and address
	Portion 12	No Information available	-	
Middelkuil 8 JQ	Portion 1	National Government of the Republic of South Africa	T27247/1954BP	N/A
		Bakgatla-Ba-Kgafela Tribe	T28/1988BP	
		Republic of Bophuthatswana		
		Bakgatla-Ba-Ga Kgafela Stam		
	Portion 2	Nomaele Moses Ramphotho	T9287/1969BP	N/A
	Portion 0 (RE)	South African Native Trust	T18759/1937BP	
		National Government of the Republic of South Africa	T3712/1972BP	
		National Government of the Republic of South Africa	T71853/2009	
	Portion 8	No Information available		

3.1 Locality Map

(Show nearest town, scale not smaller than 1:250000)

The locality of the proposed Matai Mining area is presented in Figure 1 below. The map shows the the farm portions on which the proposed activity will take place as well as the adjacent farm portions that may be affected by mining activities.

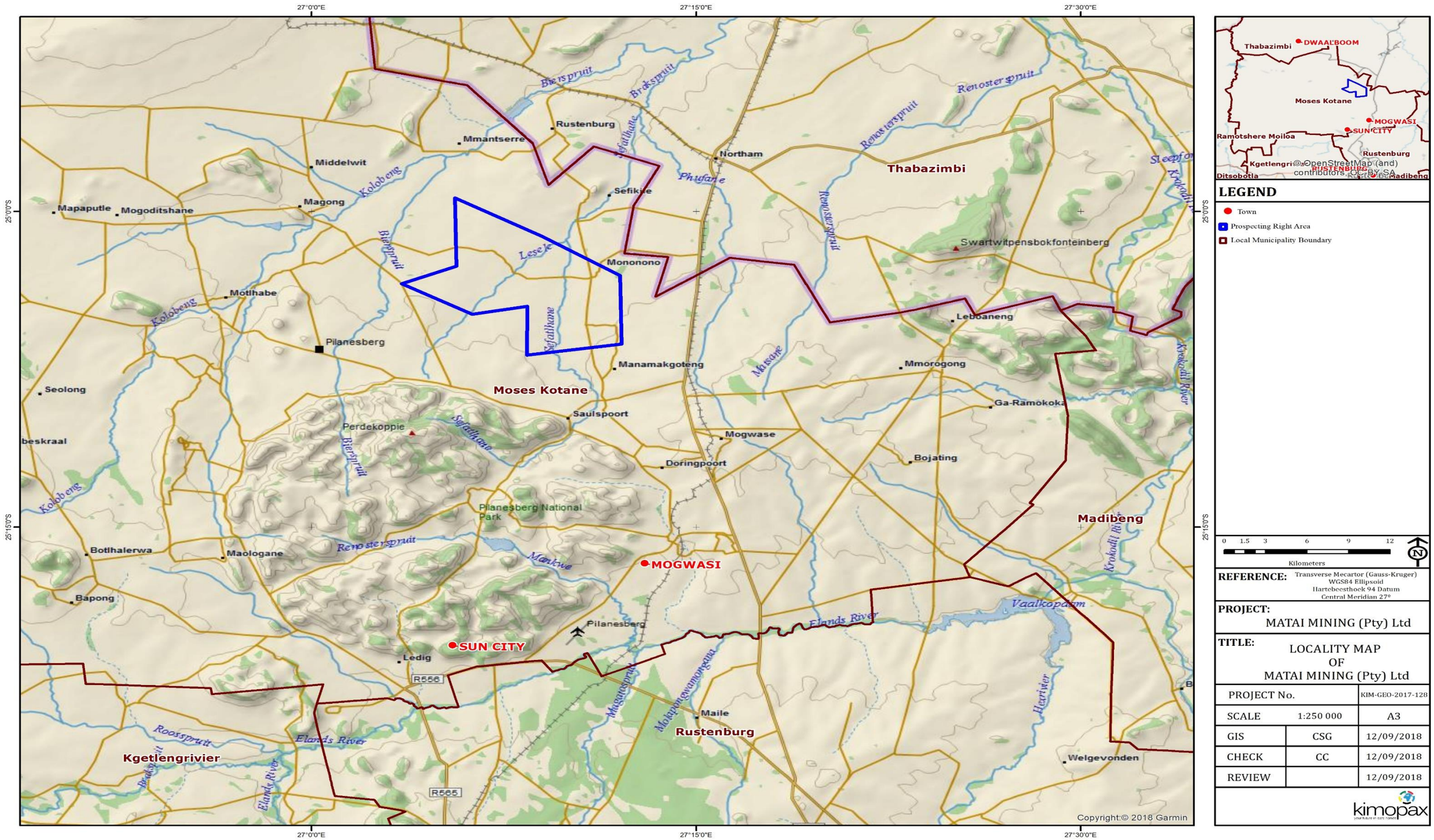


Figure 1: Locality Map

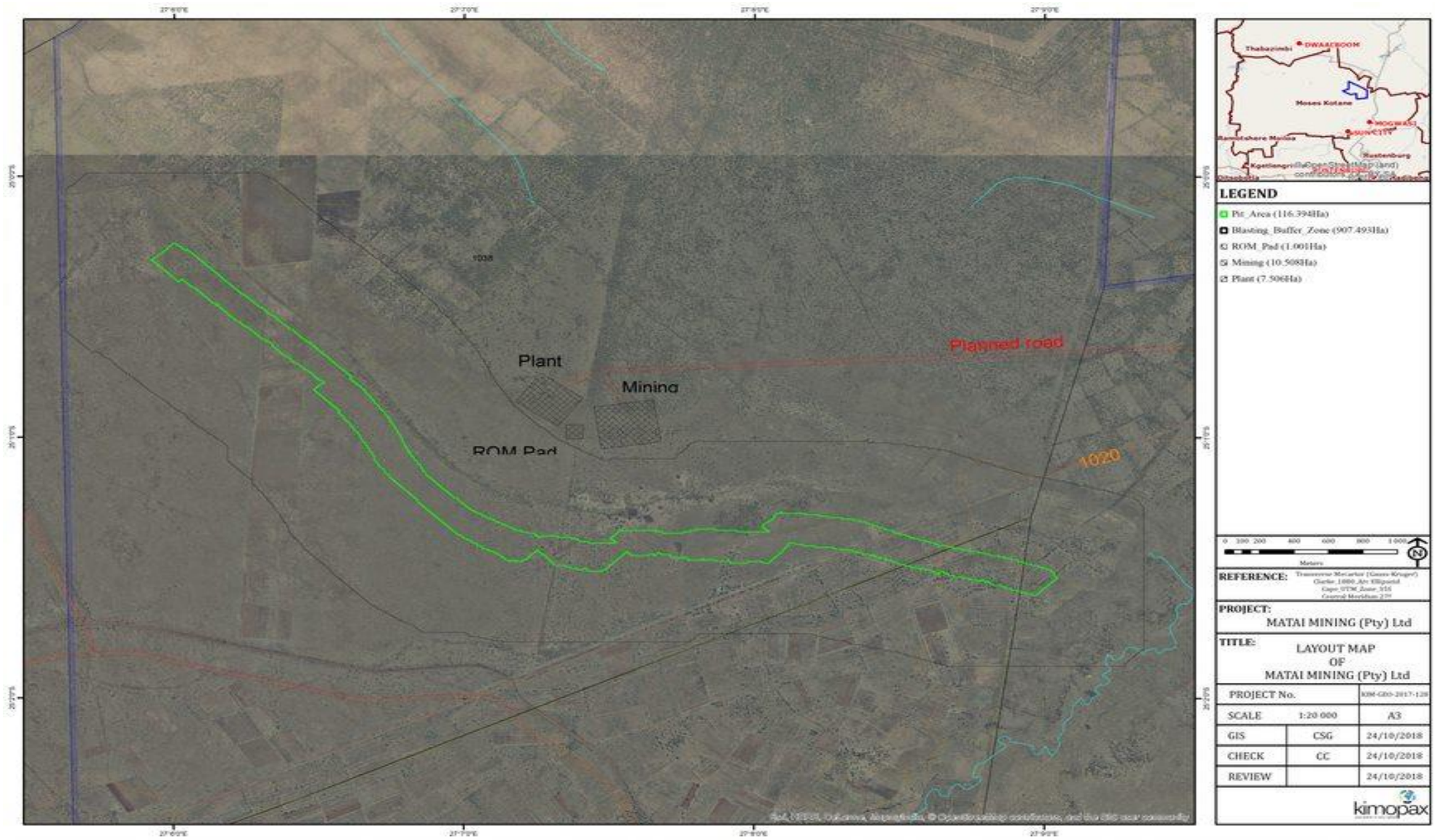


Figure 2: Locality of property and surrounding areas

4 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

4.1 Listed and specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

Table 3: Listed and Specified Activities

APPLICABLE LISTING NOTICE ***(GNR 544, GNR 545 or GNR 546)/NOT LISTED***	**NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**LISTED** **ACTIVITY** **Mark with an X where applicable or affected.**
GNR 983 Activity 24 (ii)	**Planned road** "The development of- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	X
GNR 983 Activity 13	**Storage** **"**The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014".	X
GNR 983 Activity 14	**Hazardous Storage** "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	

APPLICABLE LISTING NOTICE ***(GNR 544, GNR 545 or GNR 546)/NOT LISTED***	**NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**LISTED** **ACTIVITY** **Mark with an X where applicable or affected.**
	containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres".	
GNR 984 Activity 9	**Powerline** "The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex".	X
GNR 984 Activity 15	**Excavations** "The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- The undertaking of a linear activity; or Maintenance purpose undertaken in accordance with a maintenance".	X

APPLICABLE LISTING NOTICE ***(GNR 544, GNR 545 or GNR 546)/NOT LISTED***	**NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**LISTED** **ACTIVITY** **Mark with an X where applicable or affected.**
GNR 984 Activity 17	**Processing plant** **"**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 28 of 2002) including- Associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource; or…"	X
GNR 984 Activity 21	**Processing plant** "Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies**."**	X

APPLICABLE LISTING NOTICE ***(GNR 544, GNR 545 or GNR 546)/NOT LISTED***	**NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**LISTED** **ACTIVITY** **Mark with an X where applicable or affected.**
GNR 985 Activity 10 (f)	**Storage** "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".	X
GNR 985 Activity 12 (a)	**Excavations** **"**The clearance of an area of 300 square metres or more indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan".	X
LISTED ACTIVITIES IN TERMS OF THE WASTE ACT		
GNR 178 Category B Activity 10	**Processing plant**	X

APPLICABLE LISTING NOTICE ***(GNR 544, GNR 545 or GNR 546)/NOT LISTED***	**NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**LISTED** **ACTIVITY** **Mark with an X where applicable or affected.**
	"Construction of facilities and associated structures and infrastructure (the construction of a facility for a waste management activity listed in Category B of this Schedule not in isolation waste management)".	
GNR 178 Category B Activity 11	**Stockpiles** "Residue stockpiles or residue deposits (the establishment or reclamation of a residue stockpile or residue deposit resulting from activity which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)".	X

4.2 Description of the Activities to be Undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity).

4.3 Activities to be undertaken by Matai Mining (Pty) Ltd

Matai Mining is applying for a mining right on the farms, certain portion of farm Magazynskraal 3 JQ, certain portion of farm Haakdoorn 6 JQ, the farm Wildebeestkuil 7 JQ, certain portion of the remaining extent of portion 1, certain portion of the remaining extent of portion 2, certain portion of the remaining extent of portion 5, certain portion of 6, portions 11, 12 and 13 (portion of portion 2) and certain portion of the remaining extent of the farm Syferkuil 9 JQ, the remaining extent of portion 1, portion 2, portion 3 (a portion of portion 1), the remaining extent of the farm Middelkuil 8 JQ.

4.3.1 Mining Method

The project will entail excavation of an open cast during mining of the identified minerals. The proposed mining method commences with a box cut. Opencast mining is also known as an open-pit mining, open-cut mining, and strip mining, which basically refers to a method of extracting rock or minerals from the earth by removing the material from an open-pit. This activity will result in the transformation of the proposed site to mining use. The proposed site will be cleared off vegetation, followed by the removal of topsoil and the blasted overburden material. Mining will be performed with the use of Excavator, bulldozers, trucks, bowl scraper and shovel. The stockpile will be stockpiled for later transportation to the rehabilitation area so that it can be used promptly to avoid prolonged stockpiling of the soil and due to minimal availability of topsoil. The topsoil and overburden will be stockpiled separately. A rollover mining technique will be practised, in such a case the topsoil and overburden from the initial cut of the opencast mine are stockpiled at the position of the final cut. As the opencast mine progresses, the overburden and topsoil from each successive cut will be backfilled into the void from the previous cut, the surface will then have shaped to be free from draining, topsoil will be analysed and treated appropriately, and the surface will be fertilised and revegetated with locally indigenous species of grass, shrubs and trees. Figure 3 shows an illustration of a cross section of an open cast mining site.

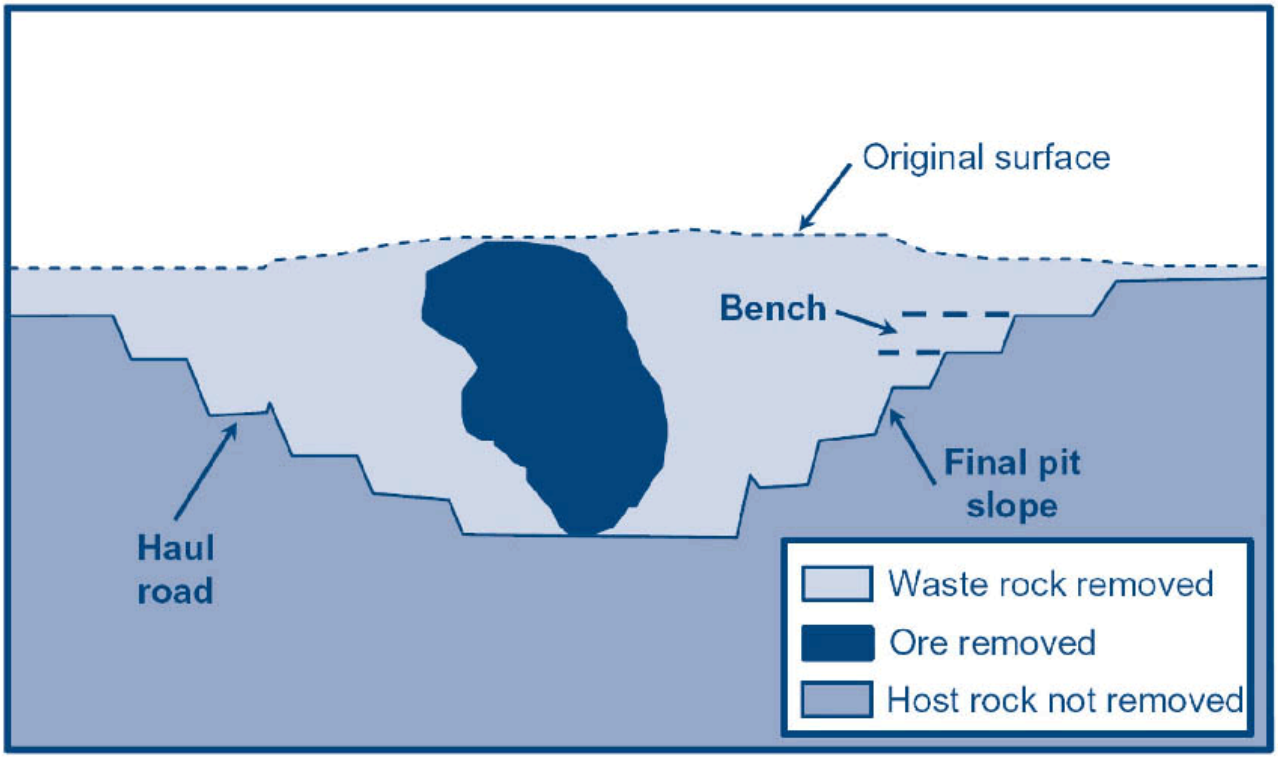


Figure 3: Schematic illustration of an open cast mining (Canada, 2017)

Based on the requirement for a 2mtpa ROM feed and a simple lumpy DSO product without beneficiation, it is assumed that a typical iron ore ROM feed size distribution and a simulated a three-stage crushing, and screening circuit is viable as defined in the attached block flow.

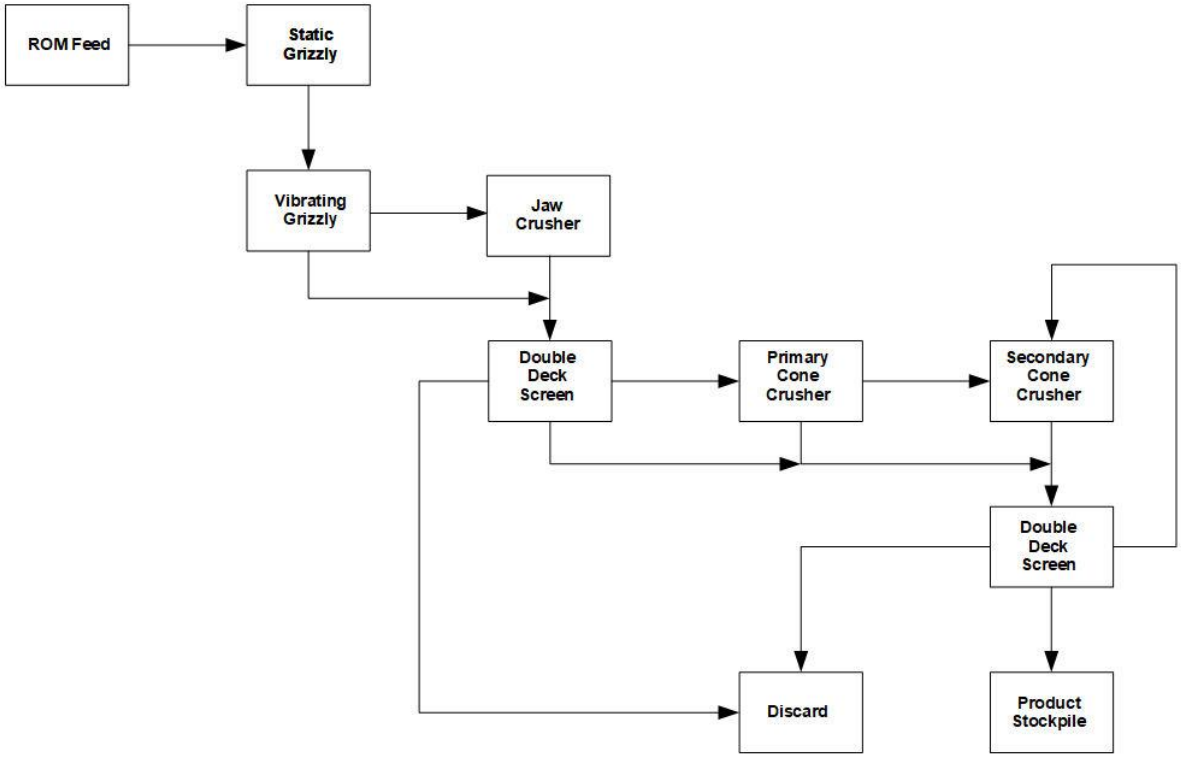


Figure 4: Ore processing flowchart

The ROM feed of 517tph includes about 40.6tph of -6 mm material and after three stages of crushing a further 59.6tph of -6 mm material is generated. The lumpy product of -32mm and +6mm amounts to an estimated 416.8 tph or 80.6% of ROM feed. The flow chart presented in Figure 4.

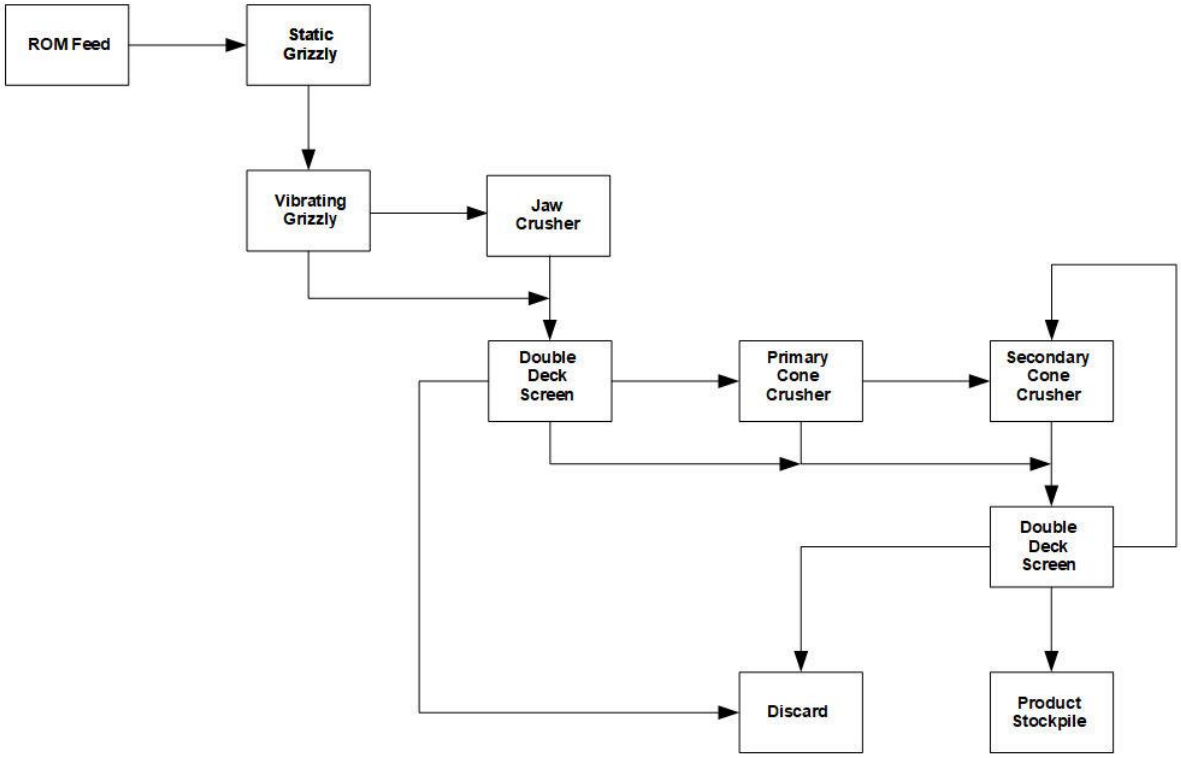


Figure **4** will be confirmed through additional crushing test work.

4.3.2 Pit Design

Datamine software was used for the pit design using the optimum pit shell from Whittle as a guide. This was based on viewing the shell in horizontal planes at increments common with mining benches spaced at intervals that were determined by a bench height of 10m. The LOM permanent pit ramps were iteratively positioned to find the optimum starting point. Benches and associated ramps were designed progressively from the bottom up.

The base of the pit was designed to accommodate a minimum mining width of 20m was used to ensure efficient manoeuvrability of the loading equipment in conjunction with the trucks. The average pit width and length will be approximately 400m and 250m respectively with a depth of 110m as illustrated in Figure 5.

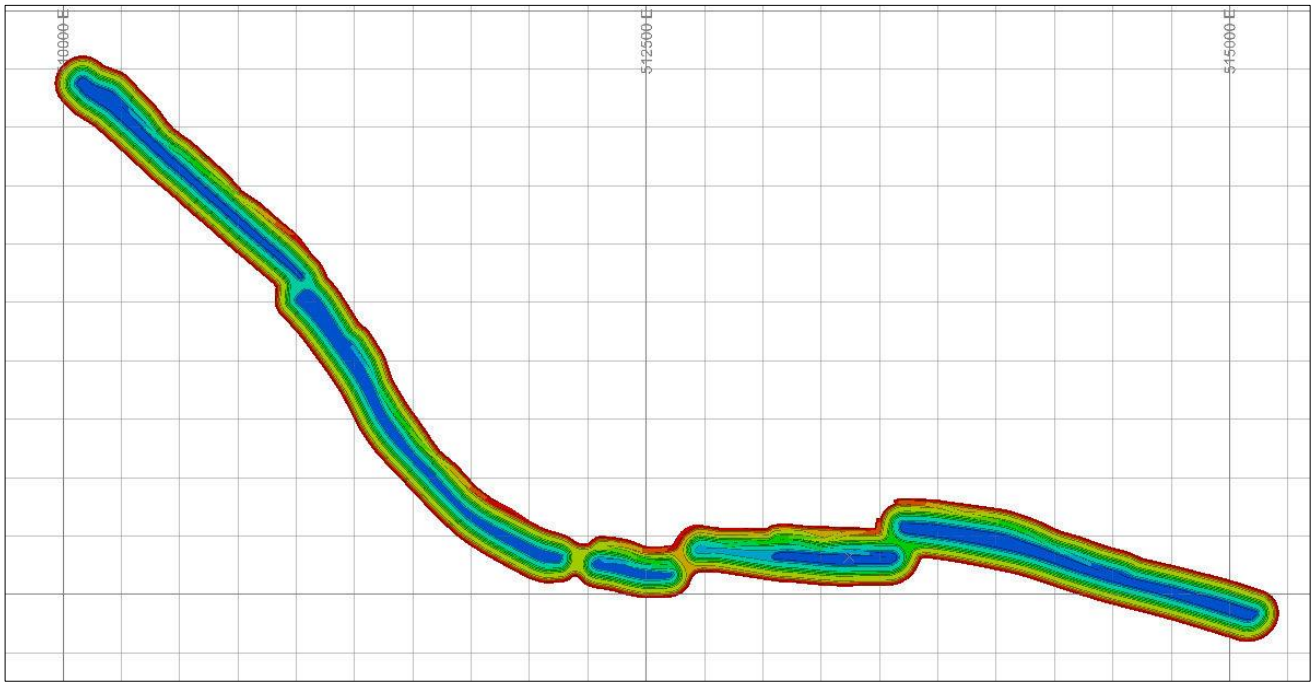


Figure 5: Plan view of pit design

4.3.3 Waste Dump Design

The objective of waste dump designs is to ensure that all the waste within the ultimate pit limit can be accommodated throughout the life of the operation. The dumps were designed with a lift height of 10m, a 35° face angle and a step-back of 10m between benches as illustrated in Table 4 and Figure 6.

Table 4: Waste dump design

Bench Height	10
Face Angle	35
Safety Berm	10
Number Benches	3
Base Length	1,000
Base Width	700

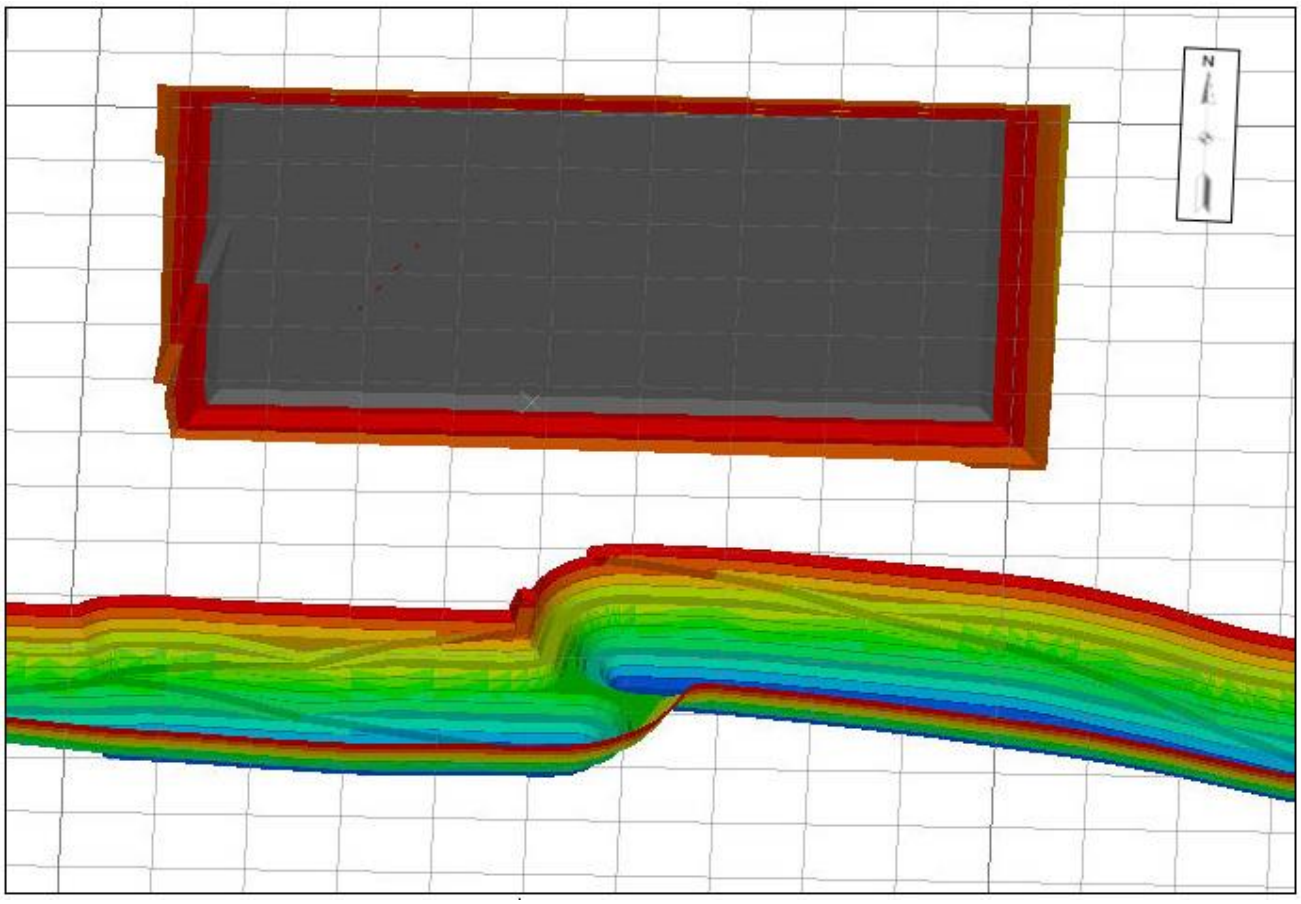


Figure 6: Isometric view of the pit and waste dump

4.3.4 Apron Feeder

Apron feeders are very rugged in design and are commonly used in iron ore applications. They are used to extract ore from bins at a predetermined rate and can handle impact loadings as is prevalent from intermittent truckloads being deposited into the receiving bin at the primary tip. The length of the apron feeder will be determined from the layout while the width and power factors will be calculated from the required capacity and speed.

4.3.5 Crushers

Gyratory crushers are very commonly used in high capacity iron ore primary crushing applications as they are beneficial in cost and operation when the capacities are higher than what a single jaw crusher can handle, the civil and structural work becomes too expensive for lower capacities. A single jaw crusher is the preferred option in a lower production requirement.

A single jaw crusher (Metso C140) with a capacity of 750mm, top size, was selected as the primary crusher. A static grizzly is placed at the primary tip to remove oversize material, with a vibrating grizzly placed before the crusher to screen off the fines before it enters the crusher. Secondary and tertiary crushing is required to reduce the size of the material to less than 32mm. Cone crushers are commonly used for this application, but it will have to be confirmed whether the technology is suitable for this ore through further test work. Toothed roll crushers and mineral sizers are ideal to minimise fines but can only handle soft to medium hard type ores. Cone crushers were selected for the secondary open circuit and closed-circuit tertiary crushing applications. The tertiary crusher has a high capacity requirement due to the re-circulating load.

4.3.6 Conveyors

The conveyor profiles were determined from the plant layout. Good engineering practice and industry accepted standards were used to calculate the conveyor widths and speeds for the various capacities. The conveyors include drives, idlers, pulleys, belting, take-ups, cleaners, steelwork, walkways, guards, and foundations.

4.3.7 Stockpile stacking and reclaiming

Various methods exist for stacking and extracting material from the stockpile, each with its' own advantages and disadvantages. In the effort to reduce the capital, a tripper conveyor is proposed for the stacking method. The mechanical components cost is essentially equivalent as for a conventional conveyor. Additional steel and civil work are required to extend the conveyor over the stockpile.

Bottom extraction was selected as the reclaim method of the stockpile. A tunnel underneath the stockpile houses a travelling rotary plough feeder and a conveyor. The capital required for this method is less than a conventional bucket or drum re-claimer, but more civil work is required due the construction of the tunnel. Due to the size of the operation, a small stacker/ re-claimer might be a viable alternative solution and should be investigated further.

4.3.8 Water supply

It is assumed that sufficient make-up water will be supplied to the perimeter of the plant area, either from municipal supply or other nearby water sources. Holding and settling dams are required to contain the water for water distribution.

4.3.9 Power Supply

It is assumed that sufficient power will be supplied at the perimeter of the plant area. The onsite power distribution will be done from the incoming substation through step-down transformers and via electrical reticulation to the various plant MCC's. Provision is included for a backup generator.

4.3.10 Access and Plant Roads

Secure access and fencing were included for the plant area, with access control via a single gate with guard houses and booms. 8m wide with 4m wide lanes were provided dual purpose roads and working areas within the main plant area. These will be as gravel surfaced roads. The final layer (wearing course) will comprise a suitable gravel material for plant type roads.

4.3.11 General Buildings

General buildings will be built for the plant and general administration sections. All visitors and employees of the mine will need to report to the security clearance area in the administration complex on arrival at the mine. Public buses and cars have access to the bus terminus and visitor parking areas respectively. All other access will be controlled by the security guard station with access control booms.

There will be a training section and clinic adjacent to the security offices for induction and training purposes, including emergency medical response. Once personnel or visitors have passed through security, they have immediate access to the plant change house facility or canteen. Personnel on lunch break or returning from their shift again have access to the canteen or change house facility before passing back through the security gates and returning home.

The plant and administrative offices are located across the road from the change house and canteen, with the possibility of direct road access via one of the gate-controlled access points with authorised plant vehicles. The road passes in front of the plant offices (with dedicated parking adjacent to the office building), continues first to the plant services area, and then to the various plant operational areas.

The plant services area contains the plant stores, capital spares yard/ laydown area and plant workshop (mechanical and electrical). All brick buildings are single-storey semi face brick buildings, with inverted box rib ("IBR") galvanized roof sheeting. Internal walls are plastered and painted. All floors are tiled or covered with raised computer flooring.

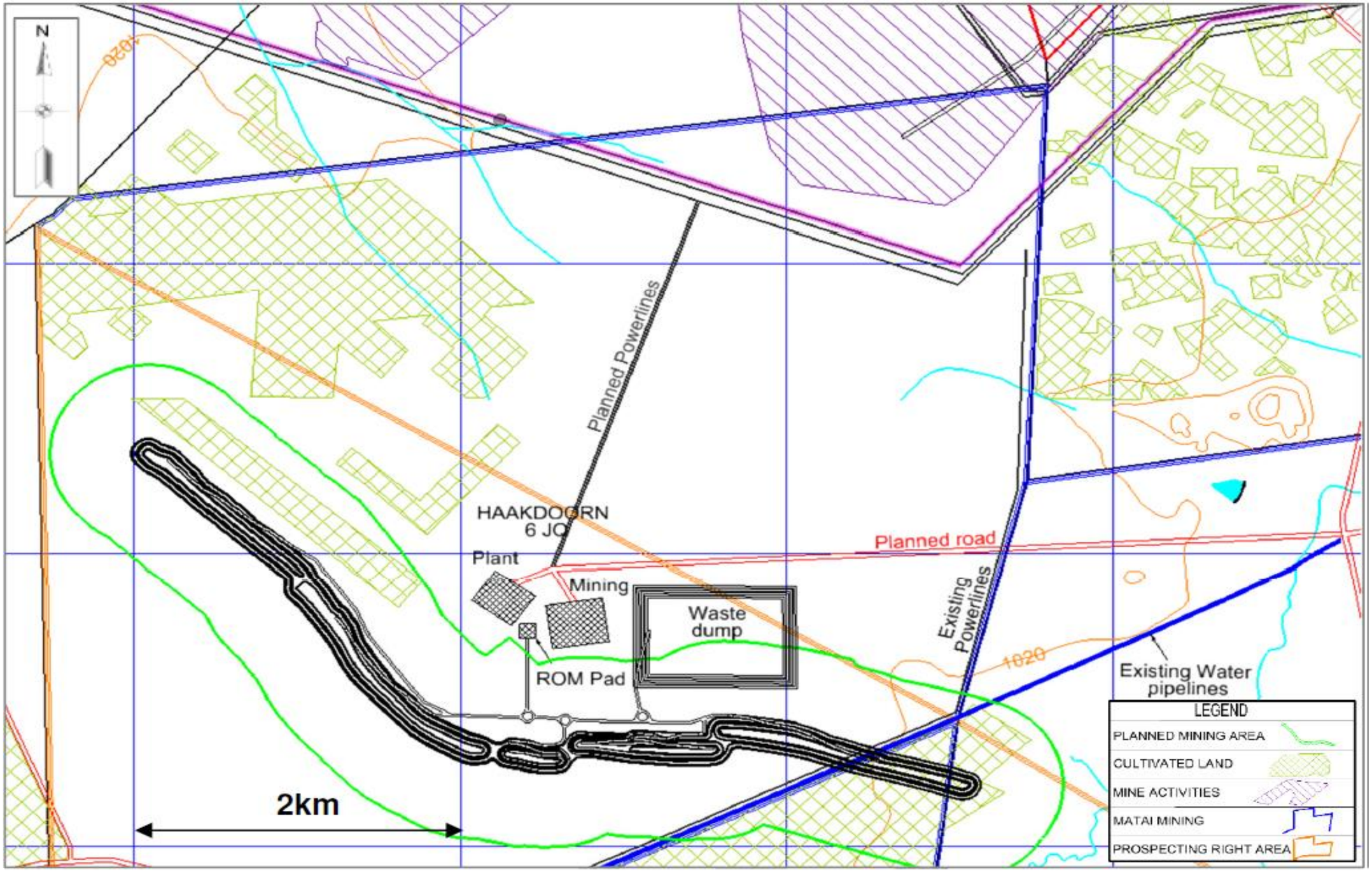


Figure 7: Surface mine layout

5 POLICY AND LEGISLATIVE CONTEXT

Table 5: Policy and Legislative context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996).	The Bill of Rights, in the Constitution of South Africa (No. 108 of 1996), Section 24 states that everyone has a right to an environment that is not harmful to health and wellbeing and requires that reasonable measures are applied to protect the environment. This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development. These principles are embraced in NEMA and given further expression. The development will ensure that as little damage as possible will be left on the surrounding environment and local community. This report is drafted to ensure compliance to this piece of legislation.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
National Environmental Management Act (Act 107 of 1998) (NEMA). The Environmental Impact Assessment Regulation GNR. 982 dated 04 December 2014 as amended in April 2017.	The National Environmental Management Act (Act 107 of 1998 as amended on the 8th of December 2014) (NEMA) and the Regulations and associated listed activities identified under Regulations 982, 983, 984 and 985, is the key national legislation underpinning environmental Authorisations in South Africa. NEMA requires that environmental authorisation is obtained for any development activity prior to its commencement. The Act requires that all environmental impacts (including social impacts) due because of the development are assessed and where possible, minimised or mitigated. NEMA and associated regulations are directly relevant to this authorisation Application

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)	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 28 of 2002) including- Associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
Occupational Health and Safety Act (No. 85 of 1993)	The employer needs to manage his/her staff and crew in strict accordance with the Occupational Health and Safety Act in order to prevent injuries to the staff.
National Water Act (Act 36 of 1998) (NWA).	In terms of Chapter 4 of the NWA, activities and processes associated with the proposed mine and associated infrastructure, are required to be licensed by the Department of Water and Sanitation (DWS). The National

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
	Water Act, 1998 (Act No. 36 of 1998) (NWA) is primary legislation regulating both the use of water and the pollution of water resources. An Integrated Water Use Licence Application (IWULA) will be lodged with the DWS in terms of Section 21 of the NWA, which lists several water uses requiring authorisation. Matai Mining's proposed mining operations involves the following water uses: under section 21: a) taking water from a water resource; c) impeding or diverting the flow of water in a watercourse; disposing of waste in a manner which may detrimentally impact on a water resource; f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; g) disposing of waste in a manner which may detrimentally impact on a water resource i) altering the bed, banks, course or characteristics of a watercourse; and j) removing,

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
	discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
National Environmental Management Waste (No 59 of 2008) (NEM: WA).	In terms of section 18, Schedule 3 of the National Environmental Management: Waste Amendment Act, 2014 (Act No. 26 of 2014) (NEMWAA), by default the mining residues are classified as hazardous wastes. According to the Regulations GN R.632 and R.633, that was inaugurated on the 24 of July 2015, the mining residues must be characterised and classified, and the design and management of residue stockpiles and deposits must be based on an assessment of the potential impacts and risks.
National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004).	The objectives of the Act are to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
	ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.
National Environmental Management: Biodiversity Act (No. 10 of 2004).	The Act identifies that all people and organizations should act with due care to conserve and avoid negative impacts on biodiversity, and to use biological resources sustainably, equitably and efficiently. Biodiversity is defined to include "the number and variety of living organisms on earth, the millions of plants, animals, and microorganisms, the genes they contain, the evolutionary history and potential they encompass, and the ecosystems, ecological processes and landscapes of which they are integral parts. Biodiversity thus refers to the life-support systems and natural resources upon which we depend".

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
	The National Environmental Management: Biodiversity Act provides for: The sustainable usage of resources, the fair and equitable sharing benefits arising from the use and application of genetic resources and material and the management and conservation of the biological diversity of South Africa.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003 as amended)	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) (CARA)	CARA provides for control over the utilization of the natural agricultural resources of the Republic of South Africa to promote the conservation of soil, water sources and vegetation and the combating of weeds and invader plants.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
Restitution of Land Rights Act, 1994, Land Reform (Labour Tenants) Act, 1996 and the Extension of Security of Tenure Act, 1997	Department of land affairs confirmed that there are no existing claims on the affected properties.
National Heritage Resources Act (Act 25 of 1999).	The National Heritage Resources Act requires all developers (including mines) to undertake cultural heritage studies for any development exceeding 0.5 ha. It also provides guidelines for impact assessment studies to be undertaken where cultural resources may be disturbed by development activities. The document will be approved by The South African Heritage Resources Agency (SAHRA) as part of the impact assessment process.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
Promotion of Access to Information Act, 2000 (Act 2 of 2000 as amended)	To give effect to the constitutional right of access to any information held by the State and an information that is held by another person and that is required for the exercise or protection of any rights.
National Development Plan (NDP)	The Province of North-West published its latest Provincial Development Plan (PDP) in 2016. This document is aimed at interventions to eliminate poverty and social inequality by 2030.
Bojanala Platinum District Municipality (BPDM) Integrated Development Plan (IDP) (2018/2022	To ensure a better life for all communities through local economic development and job creation.
Moses Kotane Local Municipality (MKLM) Integrated Development Plan (IDP) (2021/22)	Its strategy to address the main causes of unemployment and poor economic development must focus on a number of sectors, amongst the few mentioned is the mining sector.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
Environmental Management Frameworks (BPDM) and Environmental Management Frameworks (MKLM)	The MKLM and BPDK EMF share the common goal of balancing economic development, social development and environmental resource management.
Spatial Development Framework (MKLM)	To ensure sustainable Spatial Development with integrated human settlement.

Please note, the applicable legislations and guidelines are not only limited to the above mentioned.

6 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The mining project forms part of a larger scheme for the alleviation of poverty within the local municipality, which will not only improve the living standards for several previously disadvantaged communities, but also potentially allow for the future development of this area.

The project will provide positive impacts in the form of employment opportunities and skills development, skills transfer and ultimately resulting to Gross Domestic Product (GDP) growth, therefore eradicating poverty in such a case stimulating Local Economic Development. Not only that, the business opportunities will be encouraged through infrastructural development such as roads which will be constructed and improved to access the mining area, this will assist in increasing the demand for goods and services in the affected area/s in a long term. According to the outcomes of the IDP Moses Kotane (2016 -2021), community consultation meetings conducted, the main issue that was raised was the need for Local Economic Development, with unemployment as the main concern highlighted in all the different wards within the local Municipality. In the strive to poverty alleviation, the municipality greatly consider employment generation as a required tool and might be achieved through developments similar to the proposed mining project.

Since the local labour from adjacent farm communities such as Manamakgotheng, Legogolwe, Lesobeng, Mononono and Sefikile will be employed by the mine. This will have a positive impact on the wellbeing of employees with a multiplier effect on households of the employed. Moreover, the development will encourage development of Black Economic Empowerment (BEE) opportunities during construction, operation and eventual closure and rehabilitation

The economic use of the products that will be mined are discussed below:

Vanadium

One of the most important industrial uses of vanadium is in the making of steel alloys. Vanadium steel uses the strength, toughness and anti-corrosive properties that vanadium adds to it. This steel (ferrovanadium) is used to make special tools and equipment. The equipment is used in cars for gears, crank shafts, pipes and tubes in the chemical industry (ScienceStruck, 2018).

Iron Ore

Iron is primarily used to make steel which is used in the manufacturing of automobiles, locomotives, ships, beams used in buildings, furniture, paper clips, tools, reinforcing rods for concrete, bicycles etc, therefore the need of Iron mining remains high and can only be fulfilled through mining of ore.

Titanium

Moreover, due to titanium's low density and ability to withstand extreme temperatures it is used as an alloying agent with many metals including aluminium, molybdenum and iron. It is mainly used in aircraft, spacecraft, missiles, watches and laptop computers.

6.1 Period for which the environmental authorisation is required

It is anticipated that the Life of Mine (LoM) will be at least 30 years. Further decommissioning will also be required after this date.

a) 1st year-Construction phase
b) 2-28 years-operational phase
c) 1-2 years-Decommissioning and closure

7 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE.

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

Mining on its own is resource based and therefore constrained on the mineralized site, therefore can take place only within the area for which a mining right is obtained and no alternative site for mining is possible.

7.1 Details of all alternatives considered.

With reference to the site plan provided as *Error! Reference source not found.* ***and the location of the individual a ctivities on site, provide details of the alternatives considered with respect to:***

The property on which or location where it is proposed to undertake the activities:

a) The type of activity to be undertaken;

b) The design or layout of the activity;

c) The technology to be used in the activity;

d) The operational aspects of the activity; and

e) The option of not implementing the activity.

The intension of identifying alternatives in the Matai proposed project is to provide a basis for choice among other options available. It should be noted that the examination of these alternatives will allow for the incorporation of more practical, feasible, relevant, reasonable, technologically and the least environmentally impacting options available, and reducing or avoiding potentially significant negative impacts at the same time meeting the need and purpose of the proposed projects.

As per the Department of Environmental Affairs (DEA) Criteria for Determining Alternatives in EIA Guideline (2004), the types or categories of alternatives, including:

7.2 Activity Alternative

The proposed and preferred option to mine Vanadium, Titanium and Iron ore is thus far, the most preferred activity owing to the presence of these minerals within the proposed site. The mining opportunity will by far economically and socially empower and uplift the local communities. The land is presently utilised for agricultural purpose including grazing activities.

Furthermore, opencast mining method is the preferred option in comparison to underground mining. This is due to the shallow nature of Iron Ore, Vanadium and Titanium deposit that can easily be mined by means of opencast mining. Underground mining has a greater safety risk to the miners as compared to the open cast mining method. Underground mining method may be considered in future when the commodity priced get favourable and near surface resources are depleted.

7.3 Layout Alternative

The design or layout of the activity entails the consideration of the different options to place project mine. The site was selected based on the geographic location of the potentially underling required mineral reserves. The layout of the site was however selected based on considerations made for the surrounding environment where possible, ease of operations and mining activities on site as well as minimal disturbance to the community near the site. The site/land area for run of activity was selected based on the size (according to the geology of the area), and position and of the mineral reserves to be exploited. The preferred layout was more considered more importantly owing to the availability of the Vanadium,

Titanium and Iron Ore minerals, the land ownership, the geo-hydrological impacts and the ease and available transport modes and routes therefore the proposed layout is therefore the most suitable and economically/environmental viable option for the open pit mining.

7.4 The technology alternative

The project will entail excavation of an open cast during mining of the identified minerals. Mining will be performed with the use of bulldozers, trucks, bowl scraper and shovel. Gyratory crushers are normally used in high capacity iron ore primary crushing applications as they are beneficial in cost and operation when the capacities are higher than what a single jaw crusher can handle, the civil and structural work becomes too expensive for lower capacities. The conveyor profiles were determined from the plant layout. Good engineering practice and industry accepted standards were used to calculate the conveyor widths and speeds for the various capacities. The conveyors include drives, idlers, pulleys, belting, take-ups, cleaners, steelwork, walkways, guards, and foundations. A tripper conveyor is proposed for the stacking method.

In terms of the technologies proposed, these have been chosen based on their long-term success in terms of mining history, therefore no alternatives are indicated.

7.5 Operation aspects of the activity

The operations of the proposed mining involve the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations, access roads diesel, and wash bays. No feasible alternative operational aspect methods currently exist.

7.6 The option of not implementing the activity.

Should the mining right application be rejected, there will be a significant loss to valuable information regarding the mineral status present on these properties. In addition to this, should economical reserves be present, and the applicant does not have the opportunity to mine, the opportunity to utilize these reserves for future phases will be lost and the limited agricultural activities currently undertaken will continue.

8 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The Public Participation Process (PPP) is a vital component of EIA, and it is a regulatory requirement for an environmental authorisation process. It is conducted in terms of Regulations 39 to 44 of the Environmental Impact Assessment (EIA) Regulations GN R.982 (December 2014). PPP is intended to ensure a joint effort of the Interested and affected parties, the stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently. The Scoping Phase enables the I&AP to raise issues of concern and suggestions for enhanced benefits to ensure that their issues have been considered; and assists in identifying reasonable alternatives; allows for comment on the plan of the specialist studies to be undertaken during the impact assessment phase and most importantly allows for the I&APs to contribute relevant local information and traditional knowledge to the environmental assessment.

8.1 Compilation of Interested and Affected Database

The compilation of a database for I&APs started during the pre-consultation process and is currently ongoing. Attached as Appendix C1. People are responding to the newspaper adverts and requesting to be registered in the database. Regarding state organs, a search was done on the internet for contact details and contact people to include on the database. Kimopax also conducted a deeds search to identify the landowners adjacent to and in the immediate surroundings of the area. Siyanda Resources Union Mine and Chrome mine were identified to be the I&APs as they are neighbouring to the proposed project areas.

8.2 Notification of Interested and Affected Parties of the Project

The meeting scheduling is also currently undergoing with the BBKTA Administration to notify the communities about the applied Mining Right application.

8.3 Consultation Meetings with Interested and Affected Parties

Public participation meetings are currently being scheduled by the Bakgatla Ba Kgafela Traditional Authority administration with the affected villages. During the meetings Background Information

Documents (BIDs) will be distributed to all the meeting attendees and a presentation on the Mining Right Application process will be presented by Kimopax. The BID and the Consultation Register is attached as Appendix C2 and C5 respectively.

8.4 Newspaper Advertisements

A newspaper advertisement was placed in the Platinum Bushvelder in English. The Newspaper Advert is attached as Appendix C3.

Details of the press advert included:

f) Project name and description
g) Details of the client and the Environmental Practitioner
h) Project locations
i) Dead line for Comments
j) A copy or proof of published advert is attached as Appendix C3.

8.5 Site Notices

Laminated A3 site notices in English were erected with the assistance of the communities in all key position on the around the proposed area. Copies of the site notices and photographs of the places where site notices were placed/ displayed are attached in the Appendix C4.

8.6 Public Review of Draft Scoping Report

Draft scoping report was distributed to all registered I&APs and also state organs for review and comments.

8.7 Description of the tasks that will be undertaken during the environmental impact assessment process

The proposed Vanadium, Titanium and Iron Ore mining and related infrastructure project will include several activities which require a Scoping and EIA/EMP.

The EIA/EMP process followed for the proposed mining development is tailored to cater for both the National Environmental Management Act (NEMA) (Act 107 of 1998) as amended; Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002) and EIA Regulations 2014. The authorisation process will include the following:

Scoping Phase:

a) Stakeholder identification and notification process
b) State and Non-state Authority Consultation
c) Registration of issues raised by Interested and Affected Parties (Database registration)
d) Impacts identification and assessment
e) Specialist study identification
f) Compiling the Scoping report (Draft and Final)
g) Distribution of reports to stakeholders for review and informative purposes
h) Submissions of Reports to competent authorities for approval.

Impact Assessment Phase:

a) Completion of specialist
b) Environmental Impact Assessment
c) Environmental Management Plan.
d) EIA Report development
e) Distribution of Reports to stakeholders for review
f) Submission of Final reports to Competent Departments for decision making purposes.

Lead Authority's decision

As soon as the DMR has taken a decision on the proposed project, Kimopax will immediately notify I&APs of this decision and also they will be given the opportunity to appeal. The registered I&AP will be provided with a letter summarising the competent authority's decision and where ever they disagree to the decision of the authority they can lodge an appeal. Moreover, the Authorities decision was published through Platinum Bushveld advertisements.

8.8 Summary of Issues Raised by I&APS

All comments and responses received during the announcement and scoping public review period have been captured in the Appendix C 6.

The consultation is an on going process and all issues that will be received after submitting the final scoping report will be submitted to the Competent Authority.

Conclusions of the PPP

The Public Participation exercise has provided adequate information to enable an understanding of what the Matai Mining Right entails and to address the concerns and comments received during the process.

9 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

(Type of Environment Affected by the Proposed Activity its current geographical, physical, biological, socio-economic, and cultural character).

9.1 Socio-Economic Environment

9.1.1 Socio-Economic Profile

This section describes the socio-economic characteristics of the potentially affected area in order to develop an understanding of the broad social and economic conditions of the environment. The proposed project has the potential to result in both positive and negative socio-economic impacts. As such, it is essential that the socio-economic baseline conditions are understood to ensure accurate identification and assessment of potential impacts associated with the proposed project.

The data used in this socio-economic analysis was obtained from the MKLM 2022- 2027, BPDM 2022 - 2027 IDP, Statistics South Africa, 2021, Community Survey, 2021.

9.1.1.1 Traditional Authorities

Traditional authorities refer to mainly rural areas whereby chiefs and their councils are responsible for administrative tasks at a community level and in mobilising local communities if there are any investment Projects within their area of jurisdiction. The Matai Mining proposed project is located within a traditional area, namely Bakgatla-Ba- Kgafela Traditional Authority (BBKTA), however, there are other traditional authority/ies in close proximity to the proposed project area namely Bathalerwa and Baphalane Traditional Authorities which share immediate borders with the BBKTA jurisdiction and Mmatsere Traditional Authority (MTA) and Bakubung Ba Ratheo (BBR) (Development, 2014).

The BBKTA community consists of 32 villages and is located in the North West province along the Western Bushveld Complex, the world's largest known platinum reef, and as such is greatly influenced by the platinum mining industry. The area is also impacted by the demographic and economic realities of neighbouring communities. This includes urban areas in Gauteng, provincial developments in the North

West and Limpopo, market activity in southern Botswana, and interactions with other traditional authorities.

9.1.1.2 Administrative Authorities

The application falls within the jurisdiction of Moses Kotane Local Municipality. The Municipality covers an area of approximately 5 719km^2 and is mostly rural in nature, comprising 107 villages and two formal townships of Mogwase and Madikwe with an estimated population of 244817.56. The 2021 Census report's estimate that there are 75,193 households. Moses Kotane Local Municipality is one of the five constituent local municipalities of Bojanala Platinum District Municipality in North West Province of the Republic of South Africa. It shares borders with Rustenburg, Kgetleng Rivier, Ramotshere Moiloa and Thaba Zimbi Local Municipalities.

9.1.1.3 Villages Affected

Communities that are affected by the proposed project are Manamakgotheng, Mononono, Legogolwe, Lesobeng, Sefikile and Cattle post.

9.1.2 Demographic Profile

9.1.2.1 Population and Growth Trends

According to StatsSA (Census 2021), NWP has a population of approximately 4,280,000. According to the 2021 Census, Moses Kotane Local Municipality has a total population of 244817.56 people, of which 98,3% are black African, 0,8% are white, with the other population groups making up the remaining 0,9 %. The proportion of residents within the MKLM (11.9%) who have completed matric is much lower than the percentage of residents that have completed matric within the Bojanala PDM (14.9%). Furthermore, only 0.9% of the residents within the Moses Kotane LM have obtained a higher level of education..

NWP has a population of approximately 4.2 million residents, with an average household size of 3.2 and a growth rate of 1,6%. The BPDM population constitutes 42% of the provincial population with an average household size of 2.9 and 2,2% growth rate. MKLM population constitutes approximately 16% of the District Municipality population with an average household size of 3.2 (same as the province) and 0,2% growth rate (Census, 2021).

In 2021, the percentage of younger dependents accounted for 28.9% and older population accounted for 10% of the total population, which means that an estimated 39% of the population in MKLM is dependent on the economically active segment of the population.

9.1.2.2 Household Size and Composition

The socio-economic survey conducted by BBKTA reveals that each household in the BBKTA jurisdiction accommodates an average of 4.2 people. Approximately 54.5% of residents are female. This high female to male ratio is attributed to the limited economic opportunities in the region which force many men to leave in search of employment as well as the higher life expectancy among women. As a result, the majority of households in the jurisdiction are headed by females. This results in socioeconomic consequences including lower incomes, a greater number of dependants and, as a result, higher levels of poverty (Development, 2014).

9.1.2.3 Employment and Income

In 2018 the labour force participation rate for Bojanala Platinum was at 52.4% which is slightly lower when compared to the 56.7% in 2008. The participation rate is an efficient indicator that measures the success rate of the labour force relative to employment. In 2008, the unemployment rate for Bojanala Platinum was 25% and increased overtime to 27.6% in 2018. The gap between the labour force participation rate and the unemployment rate increased which indicates a positive outlook for the employment within the Bojanala District.

The unemployment rate is 48,7% which is an above 3% increase from the 2008 registered 45,5%. In 2018, there were a total number of 180 000 people unemployed in Bojanala Platinum, which is an increase of 44 900 from 135 000 in 2008. The total number of unemployed people within Bojanala Platinum constitutes 48.66% of the total number of the unemployed in North-West Province. The Bojanala Platinum District Municipality experienced an average annual increase of 2.91% in the number of unemployed people, which is worse than that of the North-West Province which had an average annual increase in unemployment of 2.21%.

Moses Kotane LM has amongst the highest unemployment rate 51%. This is discouraging as it indicates that approximately one third of the labour force wants to work but cannot find employment opportunities.

According to the Guidelines to Regional Socio-Economic Analysis, the participation rate indicates the labour force as a percentage of the population in the age group 15 – 64 years old.' The document also indicates that these rates indicate the percentage of the population that is actually economically active. In

other words, this rate indicates that the proportion of the population that is employed or is actively looking for employment opportunities relative to the number of people that are of a working age.

It should be noted that the participation rate for the Moses Kotane LM is 56.9. This indicates that slightly more than half the people within the local municipality that can work are employed. This is comparatively lower to some of the co-municipalities such as Rustenburg (73.8) and Madibeng LM (63.8). A likely explanation for the low participation rate within the Moses Kotane LM is that job seekers have given up on finding a job and therefore they are not classified as economically active. This indicates that it is possible that the unemployment rate for Moses Kotane is higher than the official rate of 33.5% indicated previously (MKLM IDP 2022-2027).

9.1.2.4 Education Levels

One of the key elements to understand the socio-economic characteristics of an area is to measure the level of education that residents have obtained. The level of education has a direct bearing on the various other socio-economic characteristics within an area. In general, low levels of education imply lower quality of life.

The proportion of residents within the MKLM (11.9%) who have completed matric is much lower than the percentage of residents that have completed matric within the Bojanala PDM (14.9%). Furthermore, only 0.9% of the residents within the Moses Kotane LM have obtained a higher level of education (MKLM IDP 2022-2027).

51% of residents within the MKLM are classified as semi-skilled and unskilled, whilst 37% of employees are classified as skilled and 12% are classified as semi-skilled and unskilled. The significant number of persons that have low levels of skills are one of the factors that have contributed to the poor socio-economic characteristics identified.

9.1.2.5 Health

MKLM rural in nature, has a greater number of people that make use of the health services (health centres) where they struggle to enjoy its benefits due to its closure and lack of medicines, operating times and shortage of nurses and safety of staff while we request them to work night shift or 24-hour operations. Mobile health centres are required in areas where the department closed the centres without public participation.

The infrastructure challenges are rapidly increasing in 107 villages and Mogwase will soon be sustainable as Lesego Private Hospital will be opening soon. There are no clear estimates, or threshold population, which proves the usage of the and services. All health centres complain about health centres, and none has shown communities well served in this respect. A study or research by the relevant department is required for estimates on the numbers of people serviced and using facilities. This was just needs collected during IDP Public Participation and the relevant department and clusters need to engage and address on the matter (MKLM IDP 2022-2027).

9.2 Biophysical Environment

The Information in this section has been obtained from the South African Weather Services (SAWS) and previous studies that were undertaken within the Moses Kotane Local Municipality.

9.2.1 Climate

9.2.1.1 Regional Climate

The mining right area falls within the Highveld Climatic Zone. According to the Safaribookings (2018), Moses Kotane Local Municipality is located within an area of summer rainfall, which is characterised by afternoon thunderstorms. Winter (May to September) is the dry season and has moderate daily temperatures and cool nights. There is virtually no rainfall during winter, and the humidity is very low.

As indicated in Figure 8, the temperatures gradually drop in the month of May, marking the beginning of winter. Average temperatures vary from 7°C/45°F in the mornings to 23°C/73°F in the afternoons. During the months of June, July and August skies are sunny and clear with daytime temperatures averaging 22°C/72°F. In September the average temperatures are a mild and pleasant 27°C/81°F during the day with cooler mornings (10°C/50°F).

As illustrated in Figure 9 wet season is notable from October to April. The regular rains break up the heat. They usually come in the form of afternoon storms, but sometimes it drizzles for a longer period. Average daytime temperatures are around 29°C/84°F. The month of October and November gets warmer and the first rains clear the haze in the sky. It rains more as the season progresses. Temperatures range from a typical 15°C/59°F in the morning to 29°C/84°F in the afternoon. December and January are the wettest months, characterised by torrential downpours in the afternoon. Daytime temperatures are typically around 30°C/86°F.

In March and April, the rainfall decreases and slowly gets colder. It further continues in April, which has lovely, clear weather and few clouds. The nights get a bit colder at about 13°C/55°F. Daytime temperatures are pleasant, around 27°C/81°F (Safaribookings, 2018).

9.2.1.2 Temperature

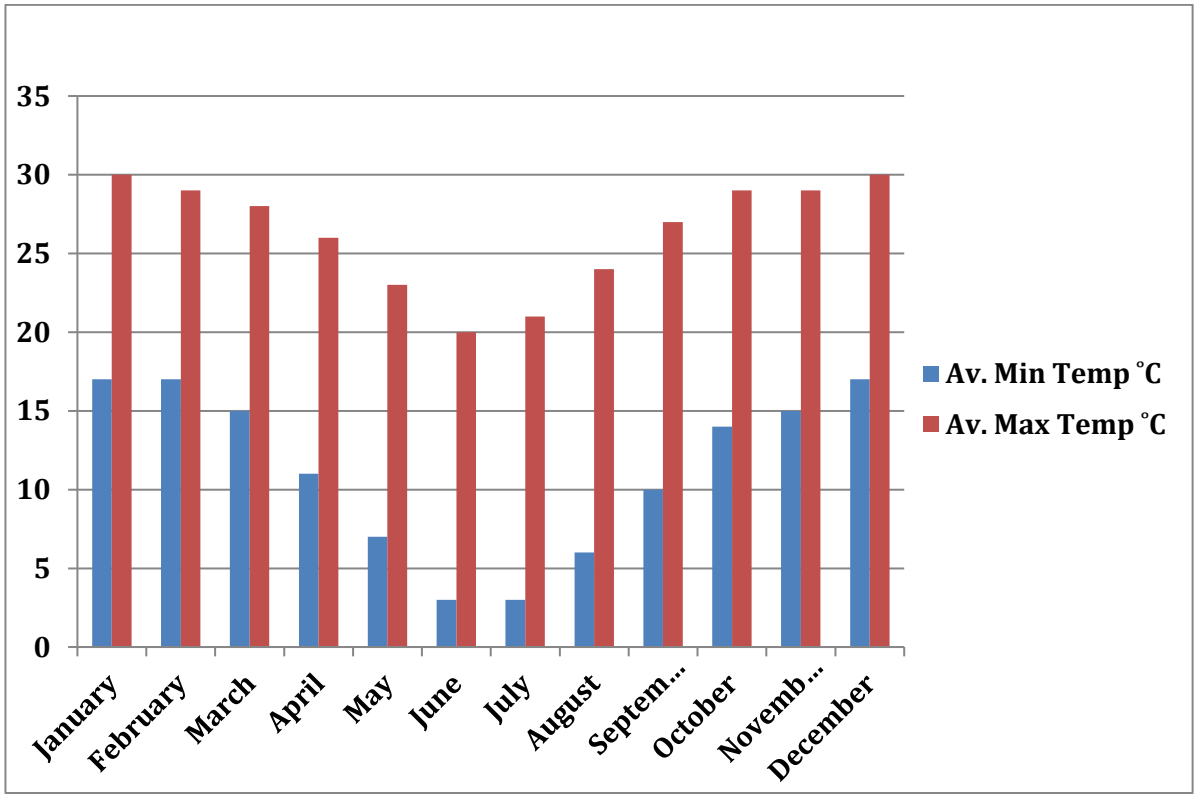


Figure 8: Average Monthly Temperature (Safaribookings, 2018)

9.2.1.3 Rainfall

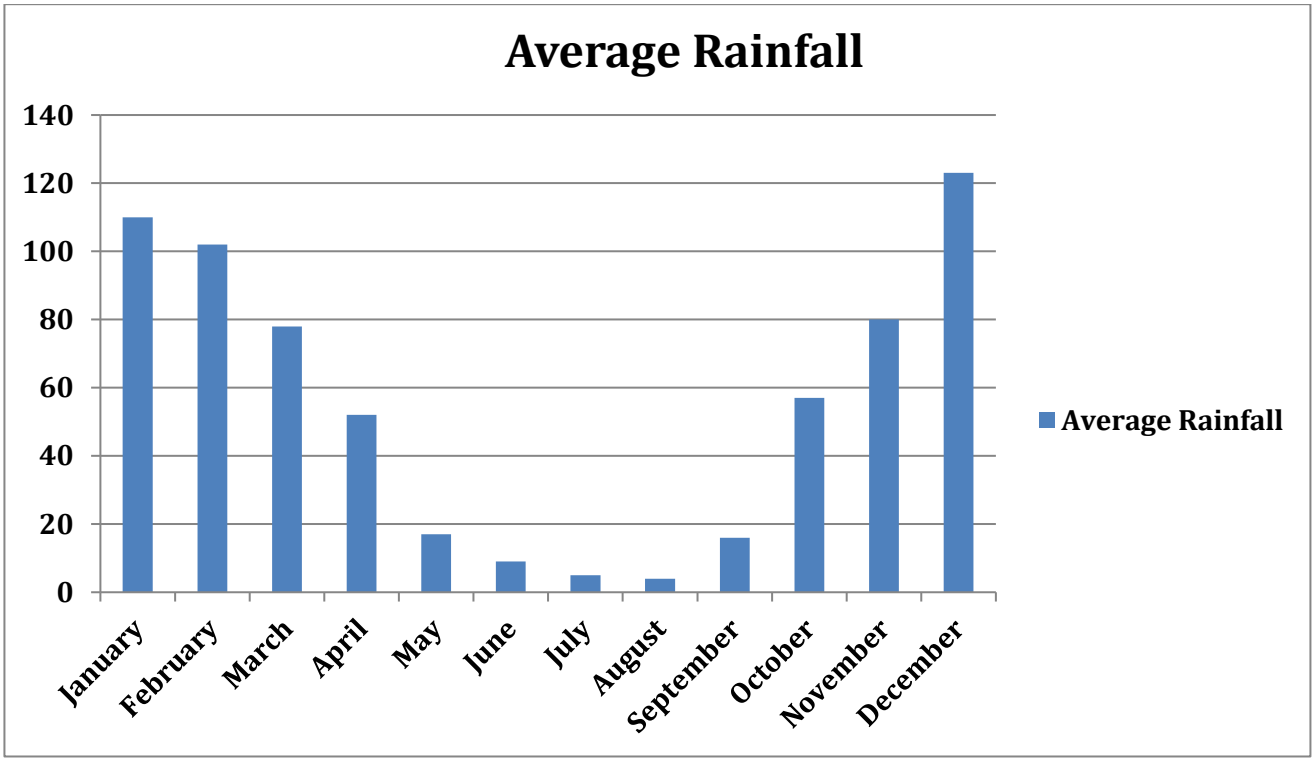


Figure 9: Total Monthly Precipitation (Safaribookings, 2018)

9.2.1.4 Wind Speed

One of the aspects that favour the suspension and resuspension of loose particulates in the atmosphere is the intensity of the wind speed regime. Wind speed greater than 5.4 m/s leads to erosion of loose dust PM and the degree of dispersion across the landscape (South African Weather Services, 2018).

9.2.2 Air Quality

It is worth noting that environmental dust is an inherent property of the natural environment, even without anthropogenic influences such as the proposed mining and transport activities. The baseline air quality status quo based on levels of pollutants within the study area will be assessed using the South African Air Quality Information System (SAAQIS). An Air quality specialist will conduct a site inspection.

9.2.3 Noise

Noise is part of our daily exposure to different sources which is part of daily living and some of these physical attributes which may at times be intrusive forms part of the ambient levels that people get used

to without noticing the higher levels. A Noise specialist will conduct a site inspection. The results are still to be included in the EIA Report accordingly.

9.2.4 Blasting and Vibration

Blasting activity will be performed in the proposed mining project for rock excavation. As part of the process, the explosive energy is exhibited in the form of elastic waves. These waves travel in all directions from the blasting area, thereby giving rise to ground vibrations, which in excess may cause damage to the nearby structures. Hence, a Blasting and Vibration studies will be undertaken to assess the impacts that the mining activity and its associated activities will exhibit to the environment and mitigation measures will be therefore be provided.

9.2.5 Traffic

According to the Traffic Impact Assessment Guideline (2015), the purpose of the Traffic Impact study is to determine the expected transport related impacts of the proposed development on the surrounding road network. Understanding the fact that all infrastructure development generates traffic, and that it may generate enough traffic to create congestion that may lead to a need for improvements to the existing infrastructure; therefore the Traffic impact assessment [TIA] is a powerful tool for engineers and transport planners to determine the possible effects of development on the transportation and traffic system and to mitigate any negative impacts. A Traffic Impact Specialist will be appointed to conduct a study for the proposed mining.

9.2.6 Geology

9.2.6.1 Regional Geology

According to available geological maps, the proposed Matai project is located on the Bushveld Igneous Complex (BIC) that is estimated to have developed approximately 2,060 million years ago. The mafic rock sequence of the BIC, the Rustenburg Layered Suite (RLS), is the world's largest known mafic igneous layered intrusion containing approximately 90% of the world's known platinum group metals (PGMs) reserves. In addition to the PGM's, extensive deposits of iron, tin, chromium, titanium, vanadium, copper, nickel and cobalt also occur.

The Bushveld Complex extends approximately 450 km east to west and approximately 250 km north to south. It underlies an area of some 65 000 km^2, spanning parts of the Limpopo, North West, Gauteng and Mpumalanga Provinces. The Bushveld Complex consists of four distinct igneous suites, namely, in age

order, early mafic sills, the Rooiberg Group felsites, multiple mafic and ultramafic layers of the Rustenburg Layered Series which host platinum group element mineralisation and the latest Lebowa Granite Suite which cross-cuts the 110 km thick Rustenburg Series. Covering of the Bushveld by younger sediments and intrusion of later magmas means that the outcrop of the Rustenburg Layered Series is limited to two basin-like lobes to the west and east and a linear lobe to the north.

9.2.6.2 Local Geology

The study area is underlain by the Bierkraal Magnetite Gabbro (BMG) from the Rustenburg Layered Suite of the Bushveld Complex (geological map 2526 Rustenburg 1:250 000). The Bierkraal Magnetite Gabbro (BMG) is classified as a ferrogabbroic Upper Zone according to the Standard zonal subdivision (Johnson & Thomas, 2006). The BMG of the Rustenburg Layered Suite consists of magnetite gabbro, diorite and a magnetite layer. The surface layer is shown in Figure 10: Geological map of the area

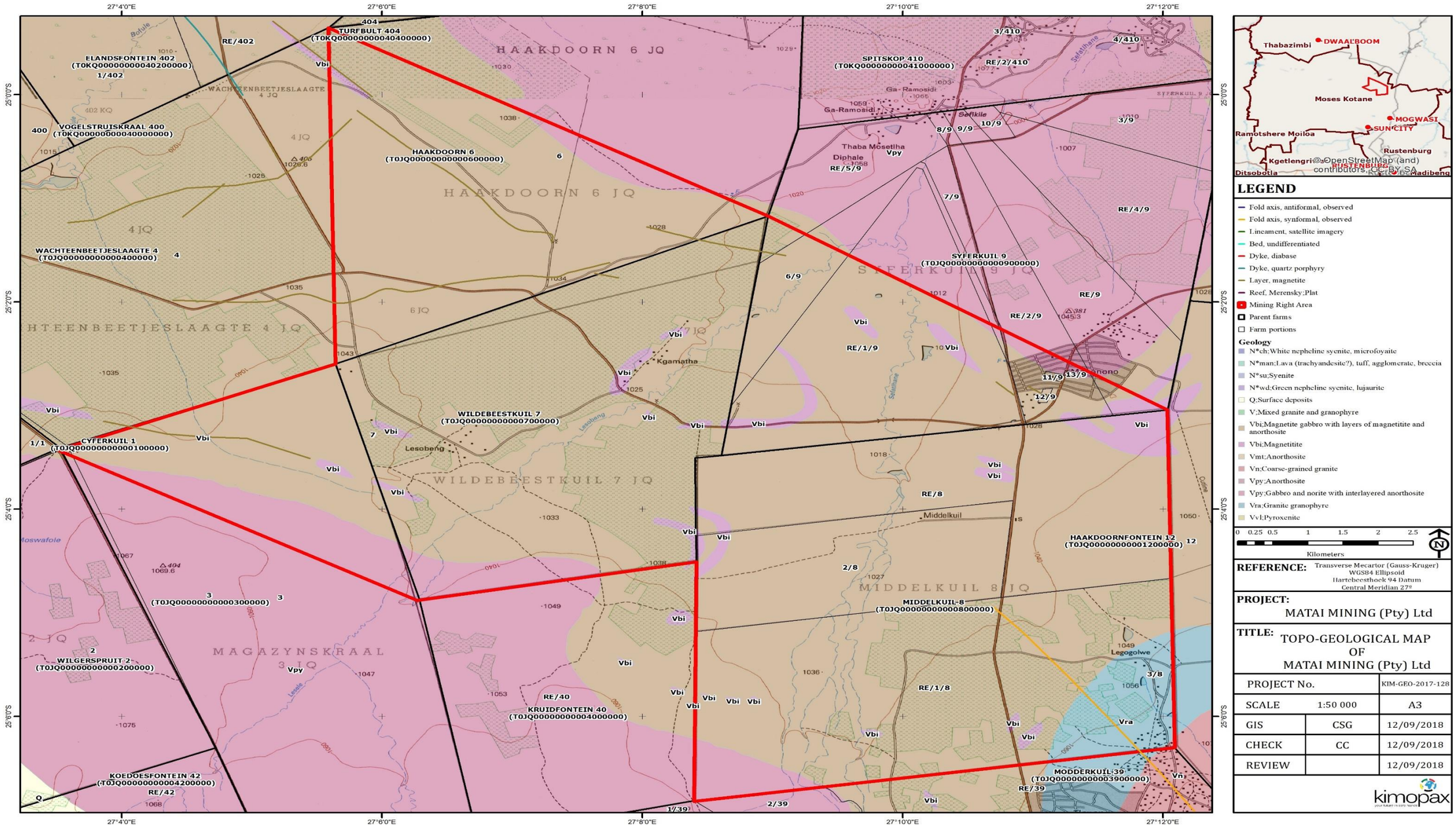


Figure 10: Geological map of the area

9.2.7 Geohydrological Setting

The 1:500 000 Geohydrological Map of Johannesburg (2526), developed by the Department of Water and Sanitation (DWS), characterise the underlying aquifers present on site as "Inter-granular" and "Fractured Type" aquifer, see Figure 11 below.

The Matai area is classified as having a moderate potential for groundwater occurrence with typical borehole yields between 0.5 and 2.0 L/s being reported. Higher-yielding boreholes are usually related to regional linear geological features like lineaments, fractures or faults.

According to the Surface and groundwater Report compiled by Kimopax (2018), there is no significant or irreversible groundwater impact expected, however, a potential risk of spillage of hydrocarbons from construction machines during the construction phase might occur. The water contamination may occur due to the runoff resulting from the contaminated surfaces within the dirty mine areas infiltrating into the surrounding streams. This, if there are no measures that will be put in place to contain the dirty water. Due to the percentage of pyrite encountered in some of the geological logs, the exposed rock piles and discard dumps might have a potential to generate acid, the groundwater quality might be negatively impacted due leaching from exposed rock piles, discard dumps and Waste Rock Dumps (WRD). Mining activities will expose the pyrite to oxidising agents such as oxygen and ferric iron. This will lead to the formation of acidic conditions and the subsequent water quality deterioration due to heavy metal transport and salt loading, as the buffering capacity of the natural rock is utilised. Mine dewatering might result in lowering of the water table within the site. This can impact on water users in the area that rely on groundwater. Many ecological systems also rely on groundwater, and a lowered water table can negatively impact on certain species. Mitigation will only be required in the event of accidents or incidents of spillage. Typical mitigation would involve, for example, containment of fluids, notifying relevant authorities, and clean-up of the site (Kimopax, 2018).

9.2.7.1 Hydrological Setting

The project site falls within quaternary catchment No. A24E which forms part of the catchment of the Crocodile River which ultimately feeds into the Limpopo. Figure 12 shows the surface water drainage system around Matai area. Watercourses over the site are likewise classified as non-perennials flowing only during the wet season or after rainfall events. The 1:50,000 topographic map for the site indicates the presence of a few small dams, while the National Freshwater Ecosystems Priority Areas (NFEPA) map illustrates the presence of fringe wetland areas associated with the dams on the site.

One primary non-perennial rivers drain the site, namely; the Phufane River to the east (Refer to Figure 12). The larger Phufane River is associated with a number of tributaries adding to the total catchment area drained by this river. Both of the aforementioned rivers intersect the site before they join the Sefathlane River, which in turn drains into the Brakspruit River. The Brakspruit River is the primary river associated with quaternary catchment A24E into which the site falls. Quaternary catchment A24E has its headwaters in the Pilanesberg situated to the south of the site.

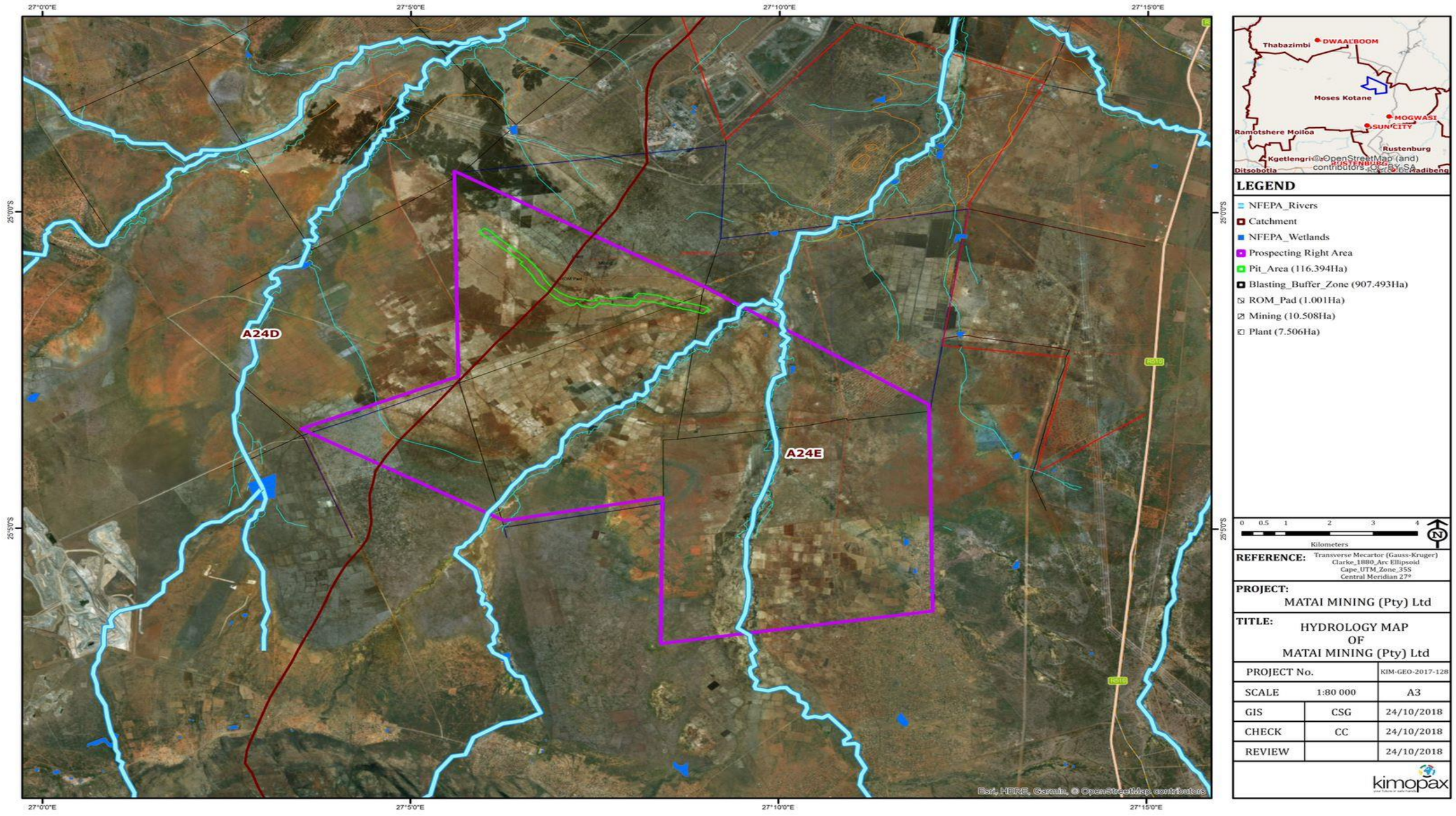


Figure 11: Geohydrological map

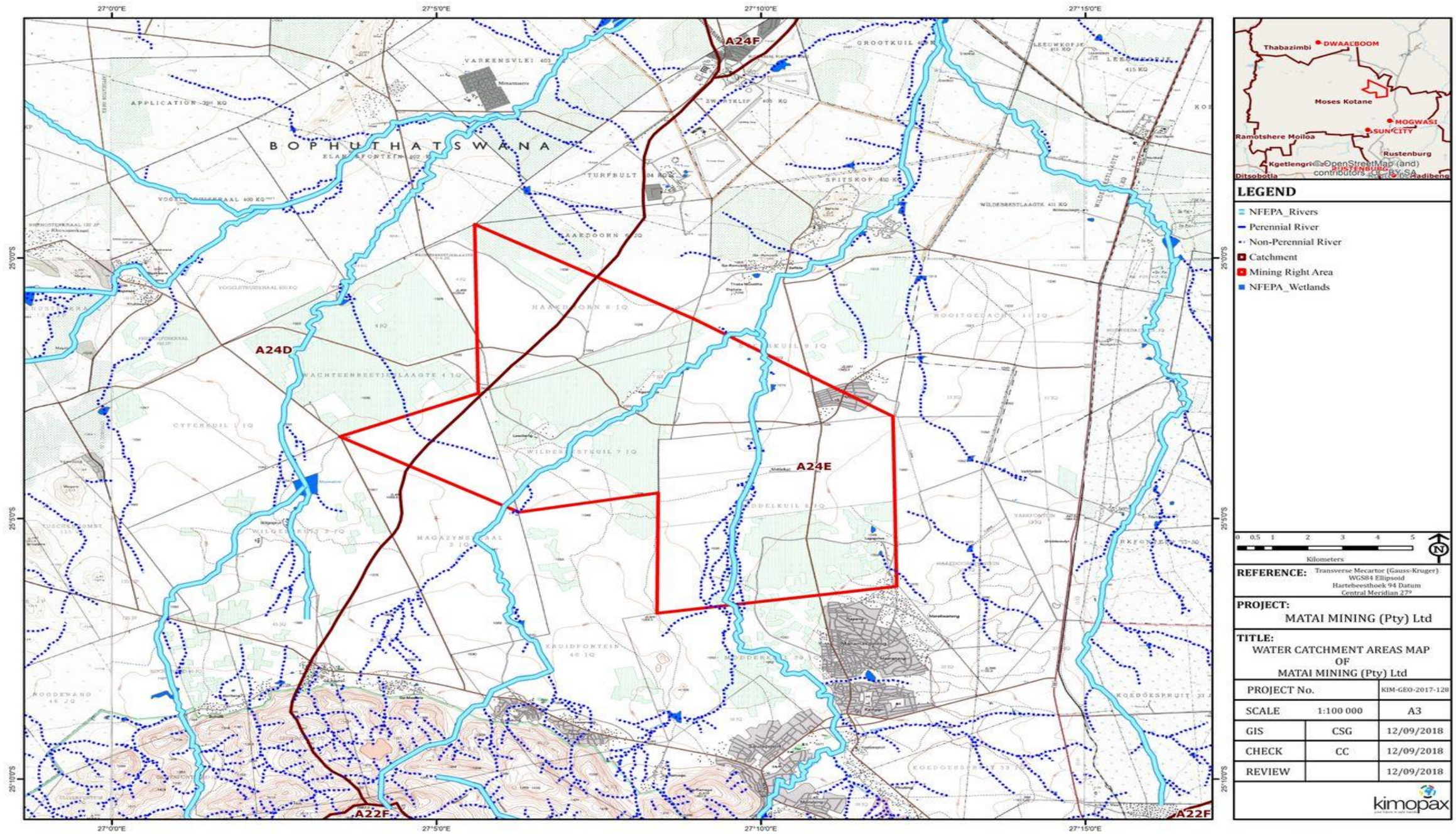


Figure 12: Drainage map

9.2.8 Topography

The project site is relatively flat, at an average elevation of 1040 metres above mean sea level (mamsl), with various non-perennial drainage lines crossing the site. The topographic relief can be described as relatively gently sloping towards the north-east, while the topographic elevation varies between 1075 mamsl in the north-east of the project site to 1015 mamsl in the north. To the south of the project site is the Pilanesberg Mountain Range and the associated hills that vary between 1330 and 1534 mamsl.

9.2.9 Soils

Soils are a significant component of most ecosystems. As an ecological driver, soil is the medium in which most vegetation grows, and a range of vertebrates and invertebrates exist. In the context of mining operations, soil is even more significant if one considers that mining is a temporary land use where-after rehabilitation (using soil) is the key to re-establishing post closure land capability that will support post-closure of land uses. The concentrations of natural salts and stores of nutrients within soils are a sensitive balance due to the extremes of rainfall, wind and temperature. The ability of a soil to retain moisture and nutrients and in turn influence the sustainability of vegetative growth and dependence of animal life is determined by the consistency and degree of soil moisture retention within the profile but out of the influence of evaporation. These conditions and the sensitivity of these variables must be noted, and their importance to the overall bio-diversity balance understood if the sustainability equation is to be managed and mitigated.

Mining projects have the potential to damage the soil resource through physical loss of soil and/or the contamination of soils, thereby impacting on the soils ability to sustain natural vegetation and altering land capability. Contamination of soils may, in turn. contribute to the contamination of surface and groundwater resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration. To understand the basis of these potential impacts, a soil and land capability study will be conducted during the assessment phase. As illustrated in Figure 13: Soils M, the majority of the mining right area is covered red-yellow a pedal, freely drained red soils.

9.2.10 Heritage and Paleontology

g) Site clearance, deposition of overburden, waste and earth moving activities to allow for the construction of mine infrastructure and the development of the mine could impact on potential heritage and paleontological resources. The severity of potential impacts on paleontological resources

is expected to be moderate/high and permanent, with little mitigation possible. No heritage resource has been identified on site presently, however an Archaeologist will conduct a Heritage impact assessment study to identify possible heritage resources within the project area.

9.2.11 Visual Baseline

Mining-related activities have the potential to alter the landscape character of the site and surrounding area through the establishment of both temporary (such as pits, mineral processing infrastructure and support facilities) and permanent infrastructure (such as the tailings storage facility and waste rock dumps). As a baseline, this section provides an understanding of the visual aspects of the area against which to measure potential change as a result of mine infrastructure and activities.

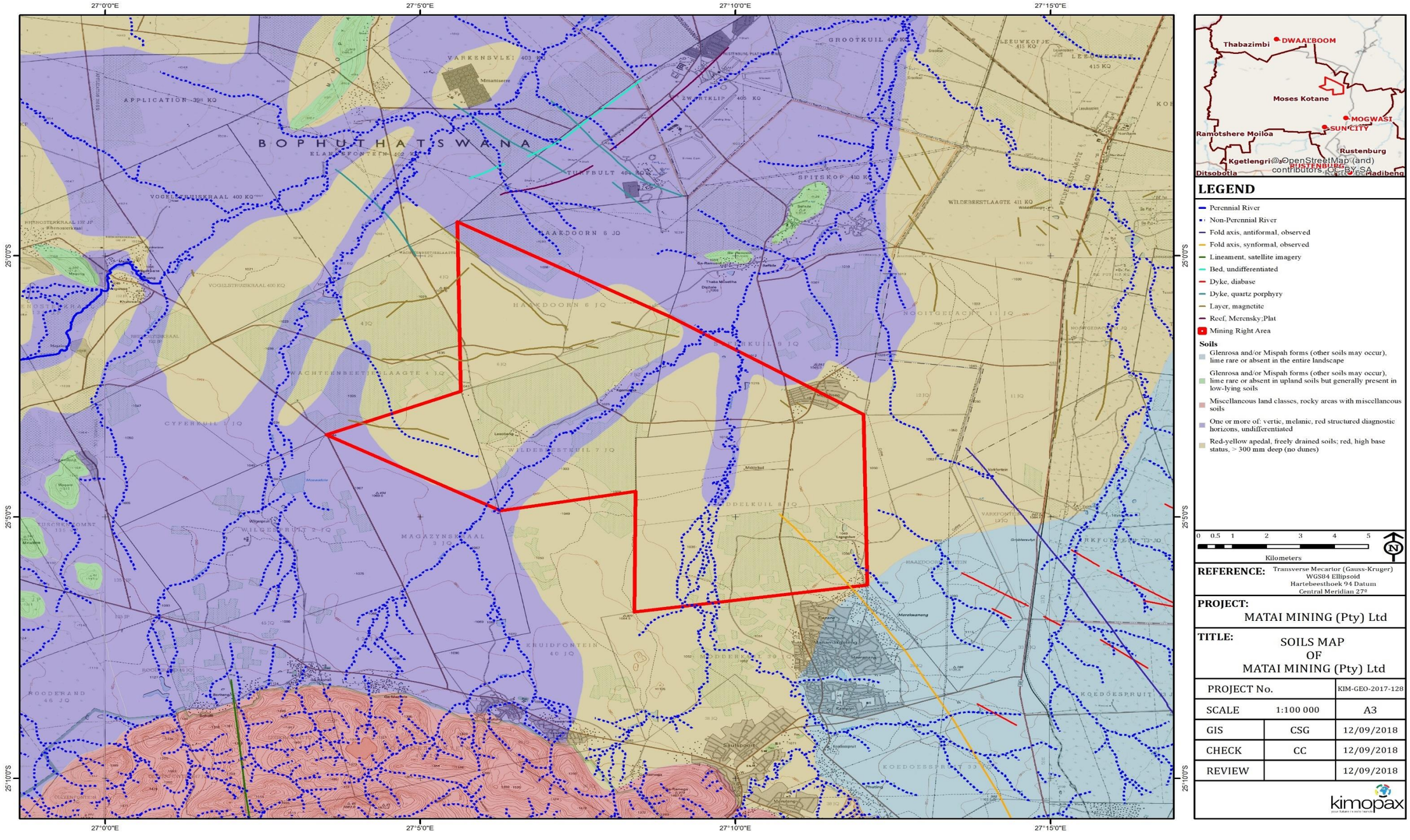
In describing the visual landscape, a number of factors will be considered, including landscape character, sense of place, scenic quality, and sensitive views. It is important to note that the area defined for the visual study is a 15km radius around the mine area; because beyond this distance, the project components would be 'absorbed' into the landscape setting. A Visual Impact Specialist will conduct a field study.

9.2.11.1 Landscape Character

The landscape character of the study area is defined by relatively flat plains, punctuated by isolated hills in the west and the dominant hills associated with the Pilanesberg National Park (PNP) in the south. While the plains have been disturbed by anthropogenic activities, the hills are relatively 'untouched' with a dense vegetation cover of bushveld species associated with the Dwaalboom vegetation type. Current land uses in and adjacent to the study area is a combination of grazing, crops, mining, residential and general community activities.

9.2.11.2 Visual Receptors

Public views (sensitive viewing areas) to the mine could be experienced by people living and visiting the adjacent communities, employees travelling to work, as well as tourists visiting the attractions in the area or travelling through the area to other destinations.



LEGEND

- Perennial River
- Non-Perennial River
- Fold axis, antiformal, observed
- Fold axis, synformal, observed
- Lineament, satellite imagery
- Bed, undifferentiated
- Dyke, diabase
- Dyke, quartz porphyry
- Layer, magnetite
- Reef, Merensky;Plat
- Mining Right Area

Soils

- Glenrosa and/or Mispah forms (other soils may occur), lime rare or absent in the entire landscape
- Glenrosa and/or Mispah forms (other soils may occur), lime rare or absent in upland soils but generally present in low-lying soils
- Miscellaneous land classes, rocky areas with miscellaneous soils
- One or more of: vertic, melanic, red structured diagnostic horizons, undifferentiated
- Red-yellow apedal, freely drained soils; red, high base status, > 300 mm deep (no dunes)

0 0.5 1 2 3 4 5
Kilometers

REFERENCE:	Transverse Mecartor (Gauss-Kruger) WGS84 Ellipsoid Hartebeesthoek 94 Datum Central Meridian 27°	
PROJECT:	MATAI MINING (Pty) Ltd	
TITLE:	SOILS MAP OF MATAI MINING (Pty) Ltd	
PROJECT No.		KIM-GEO-2017-128
SCALE	1:100 000	A3
GIS	CSG	12/09/2018
CHECK	CC	12/09/2018
REVIEW		12/09/2018

Figure 13: Soils Map

9.2.12 Biodiversity

In the broadest sense, biodiversity provides value for ecosystem functionality, aesthetic, spiritual, cultural, and recreational reasons. The known value of biodiversity and ecosystems is as follows:

a) Soil formation and fertility maintenance;
b) Primary production through photosynthesis, as the supportive foundation for all life;
c) Provision of food and fuel;
d) Provision of shelter and building materials;
e) Regulation of water flows and water quality;
f) Regulation and purification of atmospheric gases;
g) Moderation of climate and weather;
h) Control of pests and diseases; and
i) Maintenance of genetic resources.

The establishment of mining-related infrastructure and support facilities have the potential to result in the loss of vegetation, habitat and related ecosystem functionality through physical disturbance and/or contamination of soil and/or water resources.

9.2.12.1 Vegetation

As a baseline, this section provides an outline of the type of vegetation occurring in the study area and the status of the vegetation, highlights the occurrence of sensitive ecological environments including sensitive/ endangered species (if present) that require protection and/or additional mitigation should they be disturbed.

The region, in which the study area is located, is typical of the Dwaalboom Thornveld, which is a component of the Savanna Biome as illustrated in Figure 14: Biomes map. The Savanna Biome covers a large area and is subdivided into various components, with the Dwaalboom Thornveld comprising a part of the Central Bushveld Bioregion. The features of this vegetation type include plains with layers of scattered, low to medium-high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. The conservation status of this vegetation type is considered Least Threatened, and the nationally set conservation target is 19%, with 6% statutorily conserved, mostly in the Madikwe Nature Reserve and Pilanesberg Nature Reserve.

This vegetation is typified by an open canopy of *A. tortilis* (Umbrella Thorn); *Acacia* species and an abundance of *Dichrostachys cinerea* (Sickle Bush). The understory consisted mainly of grasses: *Aristida*

bipartita (Rolling Grass); *Bothriochloa insculpta* (Pinhole Grass); *E. rigidior* (Broad Curly Leaf) and *Panicum maximum* (Guinea Grass) as well as dominant forbs *Asparagus laricinus* (Cluster-leaf asparagus); *Hibiscus trionum* (Bladder Hibiscus); *Nidorella anomala* (Mulder, July 2015).

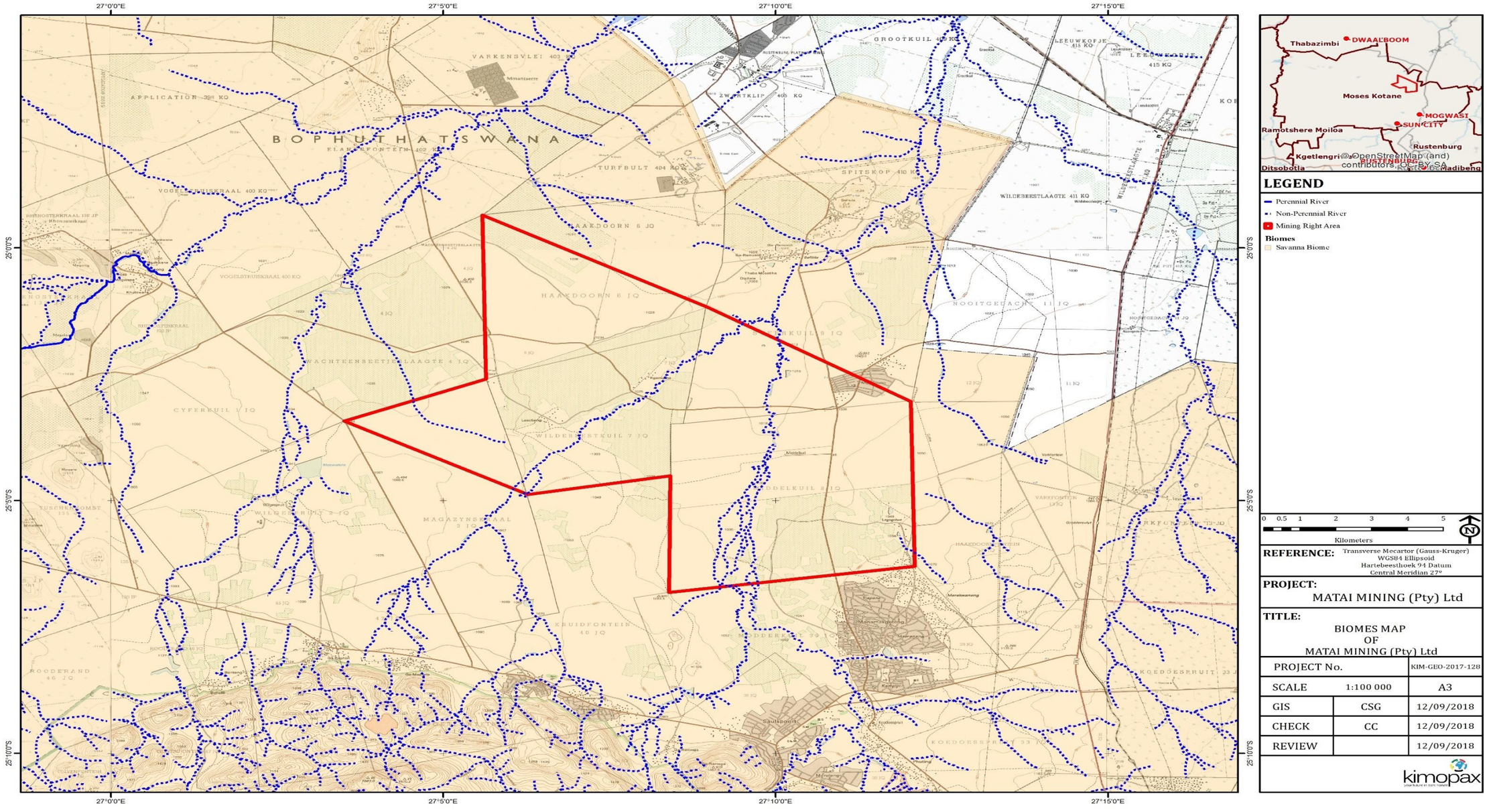
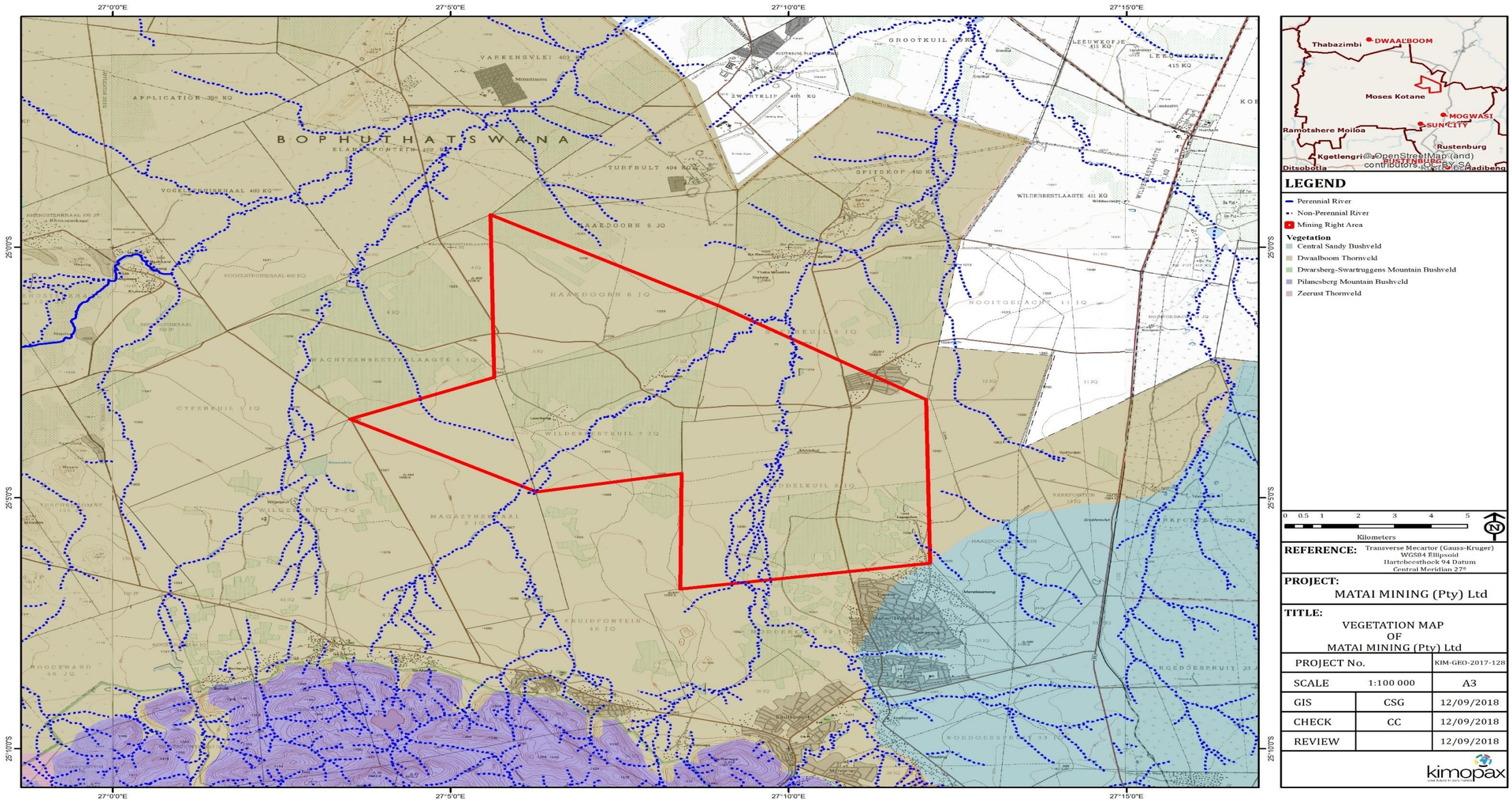


Figure 14: Biomes map



LEGEND

- Perennial River
- Non-Perennial River
- Mining Right Area

Vegetation

- Central Sandy Bushveld
- Dwaalboom Thornveld
- Dwarsberg-Swartruggens Mountain Bushveld
- Pilanesberg Mountain Bushveld
- Zeerust Thornveld

0 0.5 1 2 3 4 5
Kilometers

N

REFERENCE:	Transverse Mecartor (Gauss-Kruger) WGS84 Ellipsoid Hartebeesthoek 94 Datum Central Meridian 27°
PROJECT:	MATAI MINING (Pty) Ltd
TITLE:	VEGETATION MAP OF MATAI MINING (Pty) Ltd

PROJECT No.		KIM-GEO-2017-128
SCALE	1:100 000	A3
GIS	CSG	12/09/2018
CHECK	CC	12/09/2018
REVIEW		12/09/2018

kimopax

Figure 15: Vegetation Map

9.2.12.2 Faunal Assessment

9.2.12.2.1 Mammals

Domestic cattle, donkeys, sheep, goats, pigs, dogs and cats were common in the site area. Grazing and trampling by livestock have had an obvious adverse impact on vegetation, while predation by dogs and cats is likely to have had a negative impact on certain fauna (e.g., large terrestrial birds and reptiles). Hybridization and disease transmission may also present a problem between domestic animals and wildlife.

9.2.12.2.2 Birds

Alien birds including the Common Myna (*Acridotheres tristis*), House Sparrow (*Passer domesticus*) and Rock Dove (*Columba livia*) have the potential of existing in the study area but are expected to have a limited impact on biodiversity due to their current low abundance. Due to its proximity to Pilanesberg Nature Reserve there could be a possibility of the existence if the following bird species:

a) Secretary bird (*Sagittarius serpentarius*) which is a near threatened species based on the South African Red Data Species
b) Kori Bustard (*Ardeotis kori*) which is a vulnerable species based on the South African Red Data Species
c) Tawny Eagle (*Auila rapax*) which is a vulnerable species based on the South African Red Data Species
d) Martial Eagle (*Polemaetus bellicosus*) which is a vulnerable species based on the South African Red Data Species

9.2.12.2.3 Terrestrial Macro-invertebrates

Except for butterflies, comprehensive data of the IUCN status of any particular order of invertebrate is limited. However, the NEMBA Schedule of 2007 lists a number of South African invertebrate taxa as protected. Potentially occurring protected invertebrates which may occur within the study area include the following:

e) Tiger Beetles (Dromica spp.): protected species
f) Stag Beetles (Oonotus spp.): protected species
g) Burrowing Scorpion (*Opistothalmus glabifrons)*: protected species
h) Common Baboon Spiders (*Harpactira spp*.): protected species

10 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

10.1 Infrastructure

10.1.1 Powerlines and Pipelines

Eskom has got an existing powerline that traverses the site on the eastern portion of the proposed pit area. Magalies water have an existing water pipeline that also traverse the site on the eastern portion of the pita area. (Refer to Figure 17).

10.1.2 Access Road

A site access road is required to link the site to the national road system. The nearest national road is the R510 which is approximately 15 kilometers ("km") to the east of the site. The current gravel road (9km) requires upgrading.

There is an existing powerline, water pipeline, resevior, gravel roads, and rails that traverse the site as illustrated in Figure 16 site below. The nearest national road is the R510 which is approximately 15km from the site.

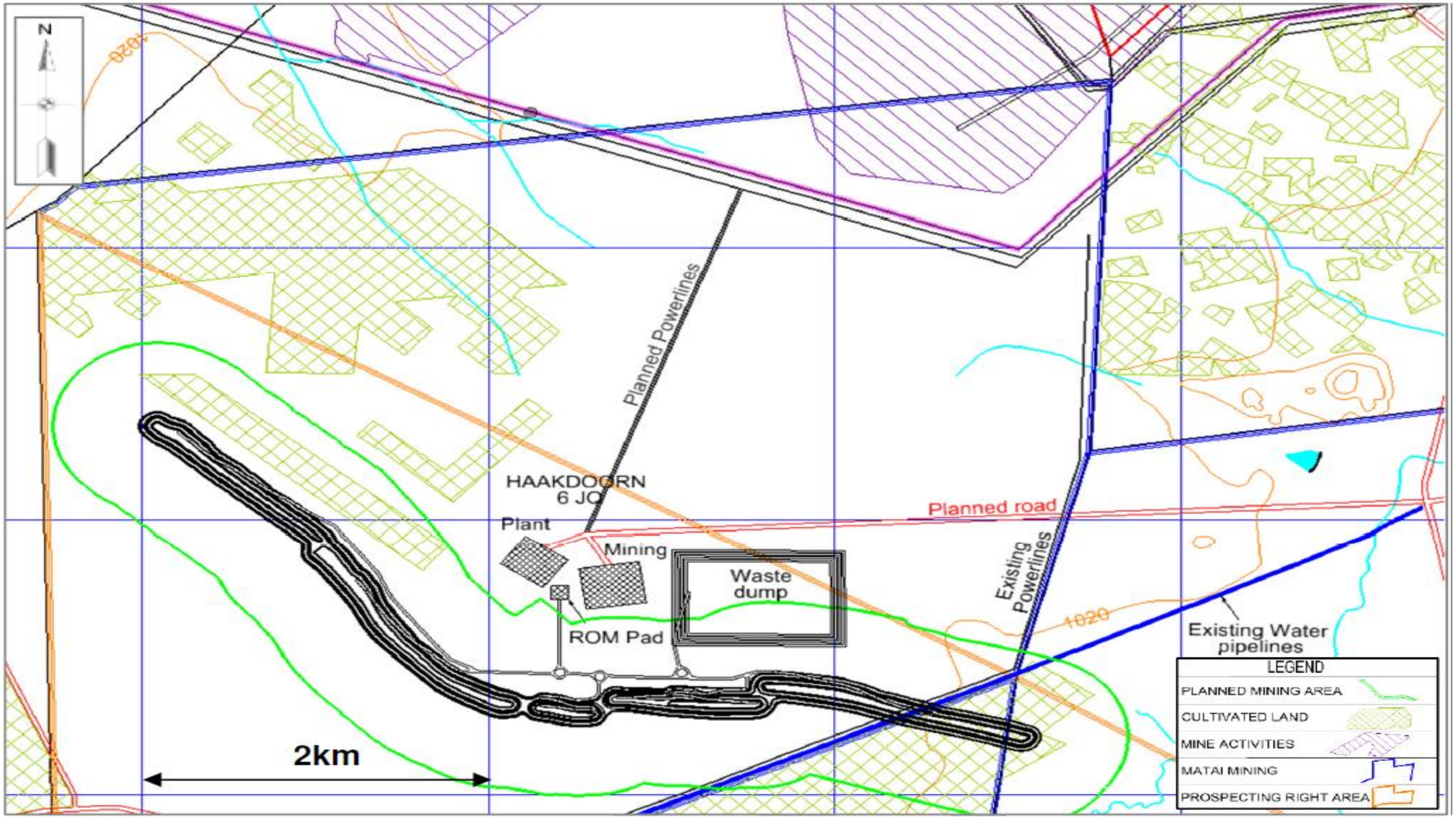


Figure 16: Proposed and existing infrastructure on site

10.2 Description of the Current Land Uses

The proposed mining site is an agricultural area and is characterized by farming and mining activities, generally the land use is open veld and wilderness as illustrated in Picture 1.

Picture 1: Property used for grazing

The properties have also been used for subsistence crop farming as illustrated in Picture 2

Picture 2: Evidence of cultivation

Although there is evidence of past agricultural use, the current land use is largely natural veld interspersed with some exotic plant species. Woodlands is identified on the farm in the higher altitude areas.

10.3 Environmental and Current Land Use Map.

(Show all environmental and current land use features)

The mining right area is characterised by mining, rural communities, grazing areas and portions of cultivated land as illustrated in Figure 17: Land-use map

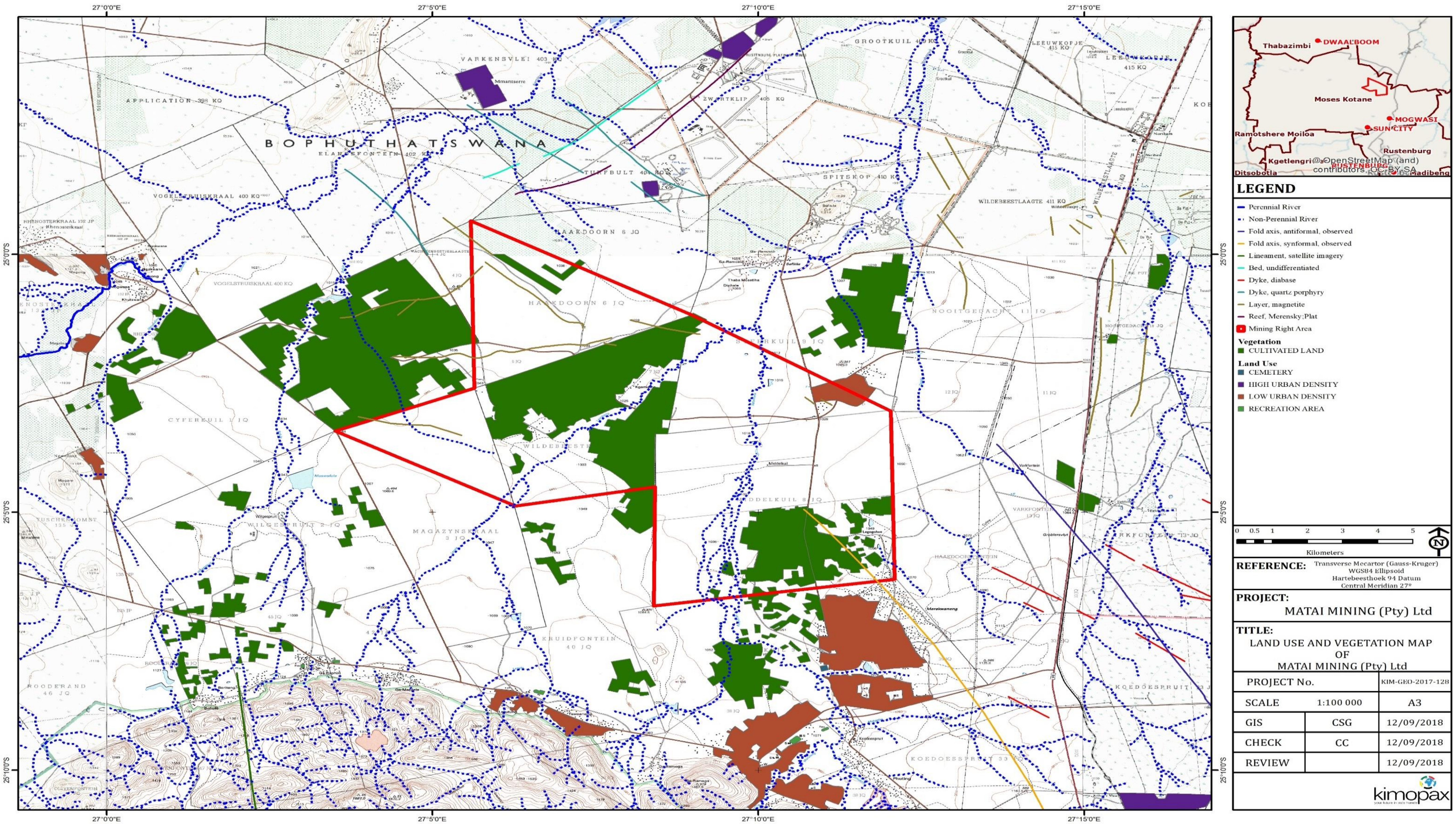


Figure 17: Land-use map

11 IMPACTS IDENTIFIED

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts.

The proposed Matai Mining project is anticipated to impact on a range of biophysical and socio-economic aspects of the environment. Hence the main purpose of this Scoping Phase is to identify and evaluate the significance of these potential impacts and to determine on how they can be minimised or mitigated. A comprehensive Environmental Management Programme (EMPr) will be developed and implemented to regulate and minimise these identified impacts during the Construction, Operational and Decommissioning phases.

Table 6: Impacts Identified

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
Construction phase					
Ecology (Fauna and Flora)	Site clearance for road construction, powerlines, water pipelines, Construction of infrastructure and the plant	a) Loss of vegetation and subsequent loss of habitat for fauna. The indigenous and natural vegetation will be impacted upon within the proposed open casted mining area as a result of clearance of vegetation due to mining	Medium	Definite	Medium–Term
Soil and Land use Capability	Site clearance for road construction, powerlines, plant Trenches and foundations for surface infrastructure development, Topsoil stripping and Stockpiling	a) Contamination of soil b) Increased risk of erosion	Medium	Definite	Long-Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
Air Quality	Stripping, dumping activities and vehicular movements on dust roads. Blasting, loading, hauling, stockpiling, backfilling and Co-Disposal Facility storage and vehicle operations	a) Increase in ambient dust levels b) Release of fugitive emissions in the form of N2O, CH4 and CO2 impact on air quality within and near the project area, particularly in the downwind direction	Medium	Possible	Short-Term
Noise, Blasting and Vibration	Equipment use and vehicular operations, trenching activities, rock excavation, hauling and transportation of materials	a) Increase in ambient noise levels. The noise from the mining machinery will be audible if opencast mining operations are undertaken during the night time, exceedances of all but the guidelines for industrial districts would be experienced and the noise levels at the nearest	High	Possible	Medium-Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
		sensitive receptors would be objectionable; b) General increase in Blasting and vibrations, excess may cause damage to the nearby structures.			
Surface Water and Wetlands	Vehicles maintenance, Fuel storage, servicing areas and construction, spilled construction materials such as cement, paint, fuel and oil.	a) Pollution of surface water resource including wetlands due to Hydrocarbon spillages	Medium	Definite	Long-term
Ground water (Geohydrological Investigation)	Excavation of an open pit mine	a) Influx of groundwater into the pits, leading to a decrease in groundwater quality and yield. b) The formation of Acid Mine Drainage in groundwater resources.	Medium	Definite	Long- Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
Heritage (Cultural and Historical Resources)	Site Clearance and Excavation of an open cast mine	a) Potential impact on heritage Resources	Low	Possible	Long -term
Traffic	Vehicular movements	a) Increase in traffic volumes on existing traffic network	Medium	Possible	Long -term
Socio-Economic Environment	Employment	a) Spontaneous settlement and increased pressure on social services due to the influx of workers to the area b) Benefits resulting from employment and income opportunities created by the mine	Medium	Definite	Medium-Term
Visual	Loading and Stockpiling	a) Dust generated during excavation of an open cast mine may cause a negative visual impact and altered visibility	Medium	Possible	Long-Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
Operation Phase					
Ecology (Fauna and Flora)	Open cast mining of the proposed minerals	a) Loss of vegetation and subsequent loss of habitat for fauna. The indigenous and natural vegetation will be impacted upon within the proposed open casted mining area as a result of clearance of vegetation due to mining b) Noise generated by the mining and mining related activities may frighten animals which may lead to injuries, deaths as well as the animals migrating away from the site.	Medium	Definite	Medium–Term
Soil and Land use Capability	Excavation of the proposed minerals, leakages of oil and other industrial liquids	a) Contamination of soil b) Increased risk of erosion	Medium	Definite	Long-Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
	from the trucks and machineries, stockpiling, equipment and vehicle operations				
Air Quality	Vehicular movements on dust roads, Blasting, loading, hauling, stockpiling, backfilling and Co-Disposal Facility storage.	a) Increase in ambient dust levels b) Release of fugitive emissions in the form of N2O, CH4 and CO2 impact on air quality within and near the project area, particularly in the downwind direction	Medium	Possible	Short-Term
Noise, Blasting and Vibration	Equipment use and vehicular operations, trenching activities, rock excavation, hauling and transportation of materials	a) Increase in ambient noise levels. The noise from the mining machinery will be audible if opencast mining operations are undertaken during the night time, exceedances of all but the guidelines for industrial districts would be experienced and the noise levels at the nearest	High	Possible	Medium-Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
		sensitive receptors would be objectionable; b) General increase in Blasting and vibrations, excess may cause damage to the nearby structures			
Surface Water and Wetlands	Vehicles maintenance, Fuel storage, servicing areas and construction, spilled construction materials such as cement, paint, fuel and oil.	a) Pollution of surface water resource including wetlands due to Hydrocarbon spillages	Medium	Definite	Long-term
Ground water (Geohydrological Investigation)	Excavation of the proposed minerals	a) Influx of groundwater into the pits, leading to a decrease in groundwater quality and yield. b) The formation of Acid Mine Drainage in groundwater resources.	Medium	Definite	Long- Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
Heritage (Cultural and Historical Resources)	Excavation of the proposed minerals	Potential impact on heritage Resources	Low	Possible	Long -term
Traffic	Vehicular movements	Increase in traffic volumes on existing traffic network	Medium	Possible	Long -term
Socio-Economic Environment	Employment	c) Spontaneous settlement and increased pressure on social services due to the influx of workers to the area d) Benefits resulting from employment and income opportunities created by the mine	Medium	Definite	Medium-Term
Visual	Loading and Stockpiling	Dust generated during the mining may cause a negative visual impact and altered visibility	Medium	Possible	Long-Term
Decommission Phase					

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
Ecology (Fauna and Flora)	Backfilling of the pit	a) Disturbance in vegetation and subsequent loss of habitat for fauna. Generation of alien invasive plants species.	Medium	Definite	Medium–Term
Soil and Land use Capability	During decommissioning phase, the rehabilitation process negatively impact the soil.	a) Compaction of soil and contamination of soil resources during rehabilitation	Medium	Definite	Long-Term
Air Quality	Vehicular movements on dust roads, loading, hauling and backfilling.	a) Increase in ambient dust levels b) Release of fugitive emissions in the form of N2O, CH4 and CO2 impact on air quality within and near the project area, particularly in the downwind direction	Medium	Possible	Short-Term
Noise, Blasting and Vibration	Equipment use and vehicular operations	a) Increase in ambient noise levels. The noise from the mining machinery will be audible if opencast mining operations are	Medium	Possible	Short-Term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
		undertaken during the night time, exceedances of all but the guidelines for industrial districts would be experienced and the noise levels at the nearest sensitive receptors would be objectionable; b) General increase in Blasting and vibrations, excess may cause damage to the nearby structures			
Surface Water and Wetlands	Vehicles maintenance, leakages of oils	a) Pollution of surface water resource including wetlands due to Hydrocarbon spillages	Medium	Definite	Long-term
Ground water (Geohydrological Investigation)	Backfilling of the opencast	a) Influx of groundwater into the pits, leading to a decrease in groundwater quality and yield.	Medium	Definite	Long-term

Environmental Aspect	Activity	Potential Impact	Significance	Probability	Duration
		The formation of Acid Mine Drainage in groundwater resources.			
Heritage (Cultural and Historical Resources)	Backfilling the opencast	Potential impact on heritage Resources if such resources is buried during the process	Low	Possible	Long -term
Traffic	Vehicular movements	Increase in traffic volumes on existing traffic network	Medium	Possible	Long -term
Socio-Economic Environment	Loss of employment	Loss of employment and enterprise development opportunities during the decommissioning phase.	Medium	Definite	Medium-Term

12 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

The significance will be determined by both the extent and duration of the impact. The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Table 7: Parameters of impacts and descriptions

PARAMETERS	DESCRIPTIONS
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: a) Onsite – Within specific site boundary (weight value – 1) b) Local – Within municipal boundary (weight value – 2) c) Regional – Outside municipal boundary (weight value – 3)
Duration	Time span associated with impact: a) Short term – 1 Year or less (weight value – 1) b) Medium term – 1-5 Years (weight value –2) c) Long term – Longer than 5 Years (weight value – 3
Intensity and reversibility	The severity of an impact on the receiving environment: a) Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1)

	b) Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2) c) High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)
Impact Significance/Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). Extent + Duration + Intensity= High/Medium/Low Impact
Probability	The likelihood of an impact occurring: a) Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1) b) Possible – 46% - 75% chance of the potential impact occurring (weight value – 2) c) Likely - >75% chance of the potential impact occurring (weight value – 3)
Environmental Risk Refer to table below	Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment. High/Medium/Low Impact X Probability= High/Medium/Low Environmental Risk

Table 8: Significance of Impacts

Significance of Impact				
	Low Impact (1-5)	Medium Impact (6-8)	High Impact (9)	
Probability	Definite/Very Likely (3)	9 - 15 L-M	18-24 M-H	27 H
	Possible (2)	6-10 L-M	12-16 M	18 M-H
	Unlikely (1)	3-5 L	6-8 L	9 L
ENVIRONMENTAL RISK	**Guidelines for Control Strategies**			
(H)-High	Proactively reduced risk level, short term response			
(M-H) -Medium High	Proactively reduce risk level, short term response			
(M)-Medium	Management strategies to reduce risk level, short to medium term response			
(L-M) Low -Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping			
(L) Low	Operational Control			

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

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Table 9: Positive and Negative impact of the proposed activity

Alternative		**Advantages**	**Disadvantages**
Activity alternatives (mining method alternatives)	Prefered Alternative (Opencast mining methods)	The shallow nature of Iron Ore, Vanadium and Titanium deposit can easily be mined by means of opencast mining. Economically and socially empowerment of the local communities	Opencast mining methods may result in direct and indirect impacts on several aspects of the environment including: Soil (compaction), flora (clearance and dust), fauna (habitat destruction, noise), air quality (dust, vehicle emissions), noise (animal life and surrounding communities), and surface- and groundwater (spillages, inadequate separation of clean and dirty water, potential leaching of water)
	Alternative 1 (Underground mining method)	In comparison to the preferred alternative, if underground mining would have been feasible there could be less surface-related	Underground mining has greater safety risk to the miners as compared to the open cast mining method. Owing to the shallow nature of the proposed minerals it is not feasible to undertake underground mining.

Alternative		Advantages	Disadvantages
		environmental impacts that would have resulted from mining.	
No-go versus Open cast mining	Open cast Mining	Mining activity was prefered on the proposed site based on the availability of Vanadium, Titainium and Iron–Ore reserves within the area. The open cast mining is prefered such that the shallow nature of the mineral deposit can easily be mined by means of opencast mining. If the mining right is granted local communities will be positively impacted through employment opportunities that will arise and the proposed area's economy will grow through trading activities associated with mining activities like transport, increase in health facility as well as an increase turnover in hospitality and tourism sectors.	**Visual impacts** The development of the mine will have a visual impact on the proposed area due to the dust generation and construction activies resulting to the mining activities. **Dust** The excavation activities and the use of the access dusty roads will result in the emission of dust into the surrounding atmosphere. This will not only impact on the surrounding communities but also the plants surrounding the area as the dust is deposited on the leaves. This interferes with the photosynthesis process of the plants. Furthermore, animals that feed on the plants will be impacted upon as this will affect their forage. **Noise**

Alternative		Advantages	Disadvantages
		Most importantly the proposed mining project will create skills development and community building opportunities to the local community therefore eradicating poverty in such a case stimulating Local Economic Development. Not only that, the business opportunities will be encouraged through infrastructural development as roads will be constructed, this will assist in increasing the demand of goods and services in the affected area/s in a long term. The project will contribute directly and indirectly to the Country's GDP. Moreover, the development will encourage income generation in the area as well as the development of BEE opportunities during construction, operation and eventual closure and rehabilitation	Noise pollution will be generated from the mining activities, namely through the movement of trucks and vehicles, machinery operations, trenching activities. Depending on the size, noise levels of the trucks and excavators may cause the noise to be localised in the specific site. **Soil contamination** Soil pollution due to the leakages of oil and other industrial liquids from the trucks and machineries. This is a potential risk of soil contamination, which will change the soil chemistry and soil nutrients of the affected soil. Ultimately this could also potentially affect the vegetation growth in the contaminated areas. **Impact on heritage resources** The mining activity could result in danger of negatively impacting on unidentified heritage resources during site assessment however, the possibility of the impact is very

Alternative		Advantages	Disadvantages
			minimal as education and training on heritage resources will be given to mine employees. **Fauna disruption** Due to the impacts of noise, dust, movement and operation of trucks and vehicles, the potential loitering of the employees and the trenching itself will disrupt the surrounding animals. This disruption can further lead to injury or death in cases where animals fall into the trenches. **Stripping (Removal of vegetation)** While all means will be applied to minimise disturbance, removal of vegetation cannot be avoided altogether. Deforestation will occur to clear the land for the opencast mining, this will leave the ground bare and prone to erosion. **Soil erosion** Erosion of the soil will occur through runoff and wind.

Alternative		Advantages	Disadvantages
			Habitat destruction The habitat that support the animal within the project site will be disturbed and destructed by the movement and operations during the mining activities. This could possibly cause the relocation of some of the animals, and result in habitat fragmentation. **Waste generation** Debris (slimes), waste rock, litter and other solid waste will be generated and deposited in and around the site. This could potentially attract nuisance and affect the natural scenery of the site. The slimes and waste rock will be used to backfill the trenches. This will be undertaken in a concurrent rehabilitation manner. **Surface and ground water impacts** The hazardous chemical spills may lead to surface water containation and ground water due to the leakages.

Alternative		Advantages	Disadvantages
	No-go Alternative	The implementation of the no-go option would result in the continuation of the current land uses (farming). Therefore, no additional impacts on the bio-physical environment will occur, besides those that are currently occurring, and / or which may potentially occur if the areas are not managed appropriately.	It is also very important to note that the implementation of the no-go option may not necessarily prevent the mining of these resources on the property, as other companies may apply to mine the resources, unless the DMR sterilizes the reserves.
Prefered Layout (No Layout Alternative was identified)	The Layout plan presented in Figure 7	The site was selected based on the geographic position of the potentially underling required Vanadium, Titanium and Iron reserves, ease of operations and mining activities on site as well as minimal disturbance to the community near the sit.e	No disadvantanges have been identified presently
Technology Prefered (No techology	Excavators, apron feeders, bulldozers, trucks, bowl scraper,	The technologies have a long-term success in terms of mining history. According to Mclanahan (2018), due to their long service	No disdvantanges have been identified presently

Alternative		Advantages	Disadvantages
Alternative was identified).	crushers, conveyors and shovels	life with low-maintenance applications, apron feeders are a popular feeder choice	
Operation Prefered (No Operation Alternative was identified)	The operation includes the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations, access roads diesel and wash bays	The mine and its related activies will generate employment opportunies.	Relocation and loss of cattle grazing area for the herders at the Cattle post, overcrowding of the area in search of greener pastures.

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

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Table 10: Mitigation measures

Activity	Potential Impact	Mitigation
Construction Phase		
Site clearance for road construction, powerlines, water pipelines, Construction of infrastructure and the plant	Loss of vegetation and subsequent loss of habitat for fauna. The indigenous and natural vegetation will be impacted upon within the proposed open casted mining area as a result of clearance of vegetation due to mining. Noise generated by the mining and mining related activities may frighten animals which may lead to injuries, deaths as well as the animals migrating away from the site.	a) Removal of vegetation should be restricted to the relevant infrastructure footprints only; b) Topsoil should be stored separately to be used in rehabilitation and landscaping, c) Transformation of natural areas should exclude any areas designated as having high or very high sensitivities; d) Prevent all effluent from the mining activities from entering the wetland habitat e) Management of the topsoil stockpile to preserve the seedbed; f) Fence development footprint area prior to commencement construction; g) No off-road driving into natural vegetation h) Implement alien invasive species eradication program.

Activity	Potential Impact	Mitigation
Site clearance for road construction, powerlines, plant, ttrenches and foundations for surface infrastructure development, Topsoil stripping and Stockpiling	Loss of soil resource and land use	a) Limiting the area of impact to as small a footprint as possible, inclusive of waste management facilities, resource stockpiles and the length of servitudes, access and haulage ways and conveyancing systems wherever possible; Implement a soil utilization plan; b) Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction; c) Topsoil to be stripped and stockpiled separately.
Site clearance	Increased risk of erosion	a) Minimise the construction footprint within any wetland areas. Clearly demarcate the required construction servitude and maintain all activities within the demarcated area; b) Maintain flow connectivity in any valley bottom wetlands during the construction

Activity	Potential Impact	Mitigation
		phase by temporarily diverting streams around the construction area; c) Install erosion prevention measures prior to the onset of construction activities;
Stripping, dumping activities and vehicular movements on dust roads	Increase in ambient dust levels	a) Regular watering of the site roads; b) Dressing off of tip faces, unused roads and disturbed areas; c) Minimising unnecessary disturbance of non-operational areas; d) Use of chemical additives to control dust to be employed if necessary.
Trenching activities, Equipment use and vehicular activity	Increase in ambient noise levels. The noise from the mining machinery will be audible if opencast mining operations are undertaken during the night time, exceedances of all but the guidelines for industrial districts would be experienced and the noise levels at the nearest sensitive receptors would be objectionable;	a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.

Activity	Potential Impact	Mitigation
Vehicles maintenance, fuel storage, servicing areas and construction equipment storage	Pollution of surface water resource including wetlands due to hydrocarbon spillages	a) Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays; b) Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil; c) Spill-sorb or a similar product will be kept on site, and used to clean up hydrocarbon spills if they should occur; d) Hazardous material will be placed in bunded areas; e) Spill kits to clean up hydrocarbon spills will be available; f) Clean upslope runoff will be diverted around construction areas. g) Prevent all effluent from the mining activities from entering the wetland habitat.
Site Clearance and Excavation of an open cast mine	Potential impact on heritage Resources	a) Conduct heritage impact assessment to identify heritage sites within the project area;

Activity	Potential Impact	Mitigation
		b) If any heritage sites are identified, appropriate steps as per the Heritage Resources Act will be undertaken c) education and training on heritage resources will be given to mine employees
Vehicular movements	Increase in traffic volumes on existing traffic network	a) Traffic signage at site access point; b) Undertake traffic impact study; c) Traffic signage at site access points; d) Upgrade gravel roads to tarred roads.
Employment	Spontaneous settlement and increased pressure on social services	a) Develop a clear and concise employment and recruitment policy that prioritizes local recruitment; b) Identify and support community development programs that address challenges raised by population influx and spontaneous settlement; c) Support local government capacity for integrated development planning.

Activity	Potential Impact	Mitigation
Operational Phase		
Blasting, loading, hauling, stockpiling, backfilling and tailings storage and vehicle operations	Release of fugitive emissions in the form of N2O, CH4 and CO2 impact on air quality within and near the project area, particularly in the downwind direction	a) Efficiency will be applied to reduce wastage and unnecessary fuel consumption; b) Carbon offsets will be considered if required; c) Concurrent best practice rehabilitation and vegetation monitoring will be applied to allow for the restoration of some the carbon sink functionality within the mining right area.
Excavation for an open cast mine	Influx of groundwater into the pits, leading to a decrease in groundwater quality and yield	a) Detailed geological mapping to identify geological features; b) Mining will take place according to design mine stability safety factors; c) Mining will not take place in the weathered overlying strata; d) Identify boreholes (undertake hydrocencus) within mining area and plug deep boreholes to prevent inflow into the pit; e) Monitor groundwater levels and yields of external borehole users.

Activity	Potential Impact	Mitigation
Excavation of an open cast mine	The formation of Acid Mine Drainage in groundwater resources.	a) Optimise storage of mine water to minimize exposure to oxygen; b) Develop a groundwater monitoring program to assess the groundwater quality; c) Should Acid Mine Drainage (AMD) be identified within the groundwater resources, the polluted water will be remediated accordingly.
Equipment, vehicle operations, leakages of oil and other industrial liquids from the trucks and machineries and stockpiling.	Contamination of soil	a) Spill leak detection plan should be implemented.
Vehicles maintenance, Fuel storage, servicing areas and construction, spilled construction materials such as cement, paint, fuel and oil.	Surface water and wetland resources due to hydrocarbon spills and carbonaceous material.	a) Implement storm water management plan; b) Divert clean storm water around construction areas; c) Surface water management structures be constructed first as to ensure that runoff and dirty water spills are contained;

Activity	Potential Impact	Mitigation
Loading, stockpiling, backfilling and Co-Disposal Facility storage.	Dust generated during the mining may cause a negative visual impact and altered visibility	a) Regular watering of the site roads; b) Dressing off tip faces, unused roads and disturbed areas; c) Minimizing unnecessary disturbance of non-operational areas; d) Use of chemical additives to control dust to be employed if necessary.
Blasting and vibrations	General increase in Blasting and vibrations	a) Blasting and other noise generating activities should be conducted during the day when surrounding noise levels is high.
Vehicular operation, hauling and transportation of material	General increase in ambient noise levels	a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.
Waste disposal	Waste generation including Debris (slimes), waste rock, litter and other solid waste will be generated and deposited in and around the site. This could	a) The slimes and waste rock will be used to backfill the trenches. This will be undertaken in a concurrent rehabilitation manner.

Activity	Potential Impact	Mitigation
	potentially attract nuisance and affect the natural scenery of the site.	
Employment	Spontaneous settlement and Increase pressure on social services	a) Develop an employment and recruitment policy that prioritises local recruitment; b) Identify and support community development programmes; c) Support local government capacity for integrated development planning.
Employment	Benefits resulting from employment and income opportunities created by the mine	a) Positive impact that need to be enhanced.
Decommissioning Phase		
Backfilling of the open cast mine	Compaction of soil and contamination of soil resources	a) Reinstatement of stored soils onto areas of disturbance where infrastructure has been demolished; b) Contour and stabilize slopes to be free-draining;

Activity	Potential Impact	Mitigation
		c) Cultivation of growing medium, the planting of required vegetative cover and irrigation if required.
Backfilling of the open cast mine	Pollution of surface water resources	a) The storm water management infrastructure, including the PCD, will be decommissioned last to ensure adequate storm water management during the rehabilitation phase; b) Erosion protection measures will be implemented at steep areas; c) Spill kits will available and hydrocarbon spills will be cleaned up immediately; d) All traces of hydrocarbons and residual waste will be removed before infrastructure is demolished.
Backfilling of the open cast mine	Increase in dust fallout	a) Regular watering of the site roads; b) Dressing off tip faces, unused roads and disturbed areas; c) Minimising unnecessary disturbance of non-operational areas;

Activity	Potential Impact	Mitigation
		d) Use of chemical additives to control dust to be employed if necessary.
Hauling, Equipment and vehicular operations	General increase in ambient noise levels	a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.
Loss of employment	Loss of employment and enterprise development opportunities	a) Develop and implement Labour and Human Resources Plan (LHRP) that address the impacts associated with retrenchment, job losses and reduced demand for local goods and services; b) Develop a closure plan which will aim to reinforce the objectives of the SLP by reducing the reliance on LCM for employment by promoting skills transfer to ensure alternative livelihoods portable skills.

13 THE OUTCOME OF THE SITE SELECTION MATRIX. FINAL SITE LAYOUT PLAN

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

The general objectives of the site selection matrix are to ensure that the activity to be undertaken is environmentally and socially acceptable, and thus sustainable. Considerations in this process are the size (land area) and the strategic location of the main activities and associated infrastructures. The site was selected based on the geographic location of the potentially underling required mineral reserves. The layout of the site was however selected based on considerations made for the surrounding environment where possible, ease of operations and mining activities on site as well as minimal disturbance to the community near the site.

14 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

The pit site for the proposed open-cast mining operations was selected based on availability of Vanadium, Titanium and Iron- Ore reserves to be mined. Minerals can only be mined where there are identified and verified, therefore it was not practical to select any other sites. The No-Go option is the only other alternative identified during the Scoping phase. If the proposed operation were not to proceed, the land may or may not be utilized for agricultural, or grazing activities in the future. It is worth noting that as much as the no go option may result in the protection of the environment in situ; the consequences of not proceeding with the proposed operation will include the forfeiture of a mining opportunity and therefore the loss of support towards the Moses Kotane municipality. It would further suggest that no new employment opportunities would be created as well as any resultant community upliftment and development programs would likely take place in the surrounding communities.

If an alternative resource cannot be identified this will limit the development of the proposed mine. The site is therefore regarded as the preferred site and alternative sites are not considered.

14.1 Statement Motivating the Preferred Site.

(Provide a statement motivation the final site layout that is proposed)

The location of the proposed mining activity was influenced by the following factors;

a) Availability of the Vanadium, Titanium and Iron Ore;
b) Land ownership;
c) Geo-hydrological impacts; and
d) Available transport modes and routes.

The proposed layout is therefore the most suitable and economically/environmental viable option for the open pit mining.

15 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

15.1 Description of alternatives to be considered including the option of not going ahead with the activity.

15.2 Activity Alternative

As already mention in Section 7.1, the proposed and preferred option to mine Vanadium, Titanium and Iron ore is thus far, the most preferred activity due to the presence of these minerals within the proposed site. The mining activity for these minerals will be applied in the EIA process. The mining opportunity will by far economically and socially empower and uplift the local communities.

As compared to the underground mining, the option to undertake the opencast mining method is the preferred option for the EIA process. The open cast is preferred owing to the shallow nature of Iron Ore, Vanadium and Titanium deposit that can easily be mined by means mining method. However, it should be well considered that the underground mining method may be reviewed in future when the commodity priced get favourable and near surface resources are depleted.

15.3 Layout Alternative

During the EIA process the layout of the site as presented in Figure 7 will be considered more importantly owing to the availability of the Vanadium, Titanium and Iron Ore minerals, the land ownership, the geo-hydrological impacts and the ease and available transport modes and routes therefore the proposed layout is therefore the most suitable and economically/environmental viable option for the open pit mining.

15.4 The technology alternative;

The technology that will be implemented during the EIA phase will involve the use of bulldozers, trucks, bowl scraper and shovel. Gyratory crushers that will be considered are normally used in high capacity iron ore primary crushing applications as they are beneficial in cost and operation when the capacities are higher than what a single jaw crusher can handle, the civil and structural work becomes too expensive for lower capacities. The conveyor profiles will be determined from the plant layout. Good engineering practice and industry accepted standards will be used to calculate the conveyor widths and speeds for the

various capacities. The conveyors include drives, idlers, pulleys, belting, take-ups, cleaners, steelwork, walkways, guards, and foundations. A tripper conveyor is proposed for the stacking method.

15.5 Operation aspects of the activity

For the EIA phase it is anticipated that the operations of the proposed mining will involve the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations, access roads diesel and wash bays.

15.6 The option of not implementing the activity.

In case the mining right application is not granted, the applicant will not have the opportunity to mine, the opportunity to utilize these reserves for future phases will be lost and the limited agricultural activities currently on site will continue.

16 DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc)

Table 11:Aspects to be assessed

Environmental Aspect	Potential Impact	Activities
Soil	Soil compaction	a) Open pit development; b) Trenches and foundations for surface infrastructure development;
	Soil erosion	(a) Removal of vegetation; (b) Topsoil stripping; (c) Stockpiles; (d) Road development;
	Soil pollution	a) Oil and fuel spills from vehicles; b) Waste generation; c) Leakage from waste storage facilities;
	Sterilization of topsoil layer	a) Stripping of topsoil during construction will remove this fertile layer;

Environmental Aspect	Potential Impact	Activities
Fauna	Loss of faunal habitat and ecological structure	a) Placement of infrastructure within sensitive faunal habitat areas; b) Site clearing and the removal of faunal habitat; c) Inadequate design of infrastructure; d) Construction of infrastructure; e) Construction of access and haul roads; f) Fire;
	Loss of faunal diversity and community integrity	a) Use of subject property; b) Construction related; disturbance; c) Removal of faunal habitat and migratory corridors; d) Collision of construction; vehicles with faunal species; e) Vehicles accessing site; f) Poaching;
Surface Water and Wetland	Reduction in resources	a) Use of Potable water;
	Reduction in surface water quantity	a) River diversions; b) Opencast and construction activities at tributaries;
	Deterioration in water	a) River diversions (bridges & Opencast sections);

Environmental Aspect	Potential Impact	Activities
	quality	b) Spilled construction materials such as cement, paint, fuel and oil;
	Water/ deterioration of surface water quality	c) Chemical contaminants; d) Vehicle wash bays and workshop; e) Spillages from sanitary conveniences, fuel deposits or storage facilities;
Ground Water	Impact on the availability of groundwater	a) Developmet of the blasting opencast mining
	Impact on the quality of groundwater	
Air Quality	Reduction in air quality	a) The dust and vehicle emissions generated by the mining activities;
Noise	Day and night time noise impact	a) Preparation of the boxcut area b) Waste Rock Dump area (close to noise sensitive area); c) Bulldozer clearing vegetation and topsoil; d) Excavator loading topsoil/softs on LHD trucks for removal to stockpiles; e) Drilling activities; f) LHD trucks idling or offloading; g) Pouring of concrete for foundations at plant; and
	Noise above ambient noise levels in the surrounding settlements and farm holdings	

Environmental Aspect	Potential Impact	Activities
		h) Diesel generator.
Blasting and Vibration	Excess may cause damage to the nearby structures	a) Rock excavation
Visual	Alter the overall landscape character and sense of place of the region	b) Preparing and planning of the site; c) Construction of mining infrastructure; d) Siting of mining infrastructure; e) Construction of mining infrastructure such - offices and plant areas; f) Removal of vegetation; and g) Loss of topsoil and creation of topsoil stockpiles.
	Dust generated during the construction phase may cause negative visual impacts	a) Preparing and planning of site; b) Construction of infrastructure; c) Removal of vegetation cover; and d) Dust generation due to movement of vehicles
	The mining facilities may impact negatively on receptors (residents and motorists)	a) Preparing and planning of the site; a) Construction of mining infrastructure; b) Siting of mining infrastructure; c) Construction of mining infrastructure such as offices and plant areas;

Environmental Aspect	Potential Impact	Activities
	situated in or utilising the identified receptor sites	d) Removal of vegetation;
Cultural and Heritage Aspects	Destruction of heritage or cultural aspects	a) Construction of mining infrastructure;
Socio-economic aspects	Economic Opportunities, Infrastructure Development and Employment	b) Increase in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around the project area.
Sioil and land capability	Loss of current land capability	a) Change of land use from natural vegetation and agriculture (livestock grazing and commercial) to industrial.
Traffic	Incease in traffic congestion	a) Mine workers traveling to and from the mine

16.1 Description of aspects to be assessed by Specialists

Several specialist were appointed to conduct studies on various aspects of the bio-physical and cultural environment, and include:

16.1.1 Air Quality Assessment

This study will include the following tasks:

a) Develop a dust emissions inventory
b) Develop a dust dispersion model to simulate dust emissions from the proposed operation
c) Assess the significance of air quality impacts

16.1.2 Visual impact assessment

A visual specialist study will be conducted for the project. The objectives of this study will be to:

a) Examine the baseline information (contours, mine infrastructure dimensions, vegetation, inter alia);
b) Determine the area from which any part of the mine may be visible (view shed);
c) Identify the locations from which views of the mine may be visible (observation sites), which include buildings and roads;
d) Analyse the observation sites to determine the potential level of visual impact that may result from the mine;
e) Identify measures available to mitigate the potential impacts; and
f) Compile a visual assessment report, indicating findings, fatal flaws, recommendations and maps indicating sensitive and/or no-go areas

16.1.3 Socio-Economic Studies

A socio-economic specialist study will be conducted for the project. The objectives of this study will be to identify socio-economic impacts of the proposed project on:

a) The regional economy;
b) Local service providers;
c) Employment;
d) Housing;

e) Infrastructure and services;
f) Health; and
g) Education and training.

16.1.4 Ecological Studies (Biodiversity included)

This study will include the following tasks:

a) Identify and map terrestrial and aquatic habitat types in the project area in the wet season;
b) Rank each habitat type based on conservation importance and ecological sensitivity; and
c) Assess the significance of biodiversity impact.

16.1.5 Surface water and Wetland impact assessment

Kimopax will conduct the surface water study in house. The investigation will include the following tasks:

d) Develop a detailed baseline hydrological description of the selected site and immediate surrounds. This will include surface water quality sampling;
e) Determine the rainfall intensities per month (1hr, 24hr, 24hr 1:50, 24hr 1:100);
f) Determine the mean monthly rainfall and evaporation;
g) Determine the mean annual runoff from the mine;
h) Determine the drainage density of areas to be disturbed;
i) Delineate the 1:100-year flood lines where relevant;
j) Identification and assessment of potential impacts of the development on surface water (quantity and quality); and
k) Development of relevant management and mitigation measures including a detailed storm water management plan.

16.1.6 Geohydrological Investigations

The groundwater detailed investigation will address dewatering and pollution aspects. The investigation will include the following tasks:

a) Conduct a hydro census;
b) Develop a conceptual model;
c) Model the dewatering impacts of the proposed open pit mining;

d) Model the potential pollution of the proposed open pit mining and associated infrastructure and activities; and
e) Assess the significance of dewatering and contamination impacts.

16.1.7 Traffic impact assessment

This study will access the following tasks:

a) Characterisation of the baseline traffic conditions; and
b) Assess the impact of the proposed project on the traffic levels, road condition and road safety.

16.1.8 Heritage and Archaeological Assessment Study

The objectives of the literature search and site walkover survey are as follows:

a) To describe and map any identified archaeological, historical, cultural, religious and natural unique sites within the vicinity of the Site; To obtain Global Positioning System (GPS) readings;
b) to delineate identified heritage receptor boundaries so that accurate polygons can be created for Geographical Information Systems (GIS) applications;
c) To record by means of written, photographic, annotated map and GPS entries, the details of each identified heritage receptor to allow the location, scale, form, function, date and relative importance of each to be ascertained; and
d) To provide a written account that details the discoveries made and which characterises the significance of the cultural heritage resources identified by the survey.

16.1.9 Soil and land capability

A soil and land capability specialist study will be conducted for the project. The objectives of this study will be to:

a) Investigate and study the soils (survey, mapping including profiling and interpretation) and use the taxonomic soil classification system to characterise and classify the soils of the overall area on a comprehensive grid base for the study of the opencast mining and roadway;
b) Assess and rate the land capability (mapping and interpretation) using the SA Chamber of Mines methodology for assessing land capability;

c) Assess the sensitivity of the soils and land to disturbance as part of an impact assessment process;
d) Develop a dominant soils/land form map and land capability plan for the areas that will be affected with specific emphasis on areas of high biodiversity sensitivity;
e) Propose mitigation measures to reduce or mitigate potential impacts; and
f) Compile a specialist report based on the results of the study.

16.1.10 Noise Assessment Study

A quantitative noise specialist study will be conducted for the project. The objectives of this study will be to:

a) Review existing noise management plans and impact assessments;
b) Conduct a baseline study of existing environmental noise levels;
c) Model noise propagation; Assess noise impacts; and
d) Develop an environmental noise management plan for proposed changes to mining plan; and compile a comprehensive noise impact assessment report detailing all of the above.

16.1.11 Blasting and vibration

A blasting and vibration specialist study will be conducted for the project.

These specialist studies, and their respective reports will also be included and discussed in the EIA and EMP phase of the project.

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

17.1 Identification and description of impacts

The purpose of undertaking an impact assessment is to ensure that the project proactively considers environmental issues as part of the project planning and decision-making processes throughout the project life cycle.

For each environmental component (i.e. visual, air quality, health), impacts will be identified and described in terms of: detectability / visibility of the impact, exposure of receptors to the impact, compliance with legislation and standards, other applicable targets, limits or thresholds of concern, the level of change / intrusion imposed, and receptor sensitivity. The impact assessment phase will consider:

a) Physical, biological, social and economic components of the environment and their interrelationships;
b) The ability of receptors and affected parties to adapt to changes and thus maintain livelihoods after the operation has closed;
c) The effects of all stages of the project life cycle, including planning construction, operation, decommissioning and post closure;
d) Positive and negative environmental and social impacts;
e) Direct, indirect and cumulative impacts;
f) Short- and long-duration impacts within the zone(s) of influence, and extreme events;
g) Potential trans-boundary effects and global impacts (e.g. air pollution, withdrawal of water from an inter-provincial waterway and emission of greenhouse gasses); and
h) Potential impacts on local communities and/or other vulnerable individuals or groups.

17.1.1 Existing Impacts

As previously highlighted the proposed mine is situated in an area affected in past and present by various activities such as agriculture and residential.

17.1.2 Direct Impacts

These are impacts that occur through direct interaction of an activity with an environmental, social, or economic component, these impacts are normally analyed in isolation (impacts of an individual activity). The predicted direct impact include erosion, formation of sinkholes, loss of biodiversity, and contamination of soil, groundwater and surface water by chemicals from mining processes.

17.1.3 No-Go Development Impacts

The no go option may result in the protection of the environment however if the mining activity is not conducted the mining Right opportunity will be forfeited and it would further suggest that no new employment opportunities would be created.

17.1.4 Cumulative Impacts

As per the requirements and the principles of integrated environmental management, the cumulative impacts must be considered for the proposed development. Noise impact emanating from the mining activity combined with the ambient noise emissions from Siyanda Resources Union Mine and Chrome mine the agricultural activities and the surrounding communities may result in adverse accumulated impacts.

In addition, the proposed Matai mining activities together with the surrounding current mining activities may collectively have an impact on the regional geological strata. It is worth noting, moreover that the potential destruction of the natural vegetation and the habitat loss for fauna species, may occur on a cumulative scale, in case other activities in the area have a similar impact on the biodiversity of the area. The ambient air quality decorates from the collective dust resulting from the proposed mining and the current mining activities.

Moreover, additive to the current mining and other related activities, visual impacts may be mounted in nature as a result of the proposed mining activities.

For this project, cumulative impacts will be determined as:

Existing Impacts + Direct Impacts = Cumulative Impacts

17.1.5 Impact Mitigation

The significance of environmental impacts will be rated before and after the implementation of mitigation measures. The impact rating system considers the confidence level that can be placed on the successful implementation of the mitigation.

17.2 The proposed method of assessing duration significance

The proposed method of assessing the duration significance was discussed in section 13

18 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED.

Table 12: Measures to avoid, reverse, mitigate and manage impacts

Activity	Potential Impact	Mitigation	Potential for residual risk
Construction Phase			
Site clearance for, road construction, powerlines, water pipelines, general buildings and the processing plant	Loss of vegetation and subsequent loss of habitat for fauna. The indigenous and natural vegetation will be impacted upon within the proposed open casted mining area as a result of clearance of vegetation due to mining. Noise generated by the mining and mining related activities may frighten animals which may lead to injuries, deaths as	a) Removal of vegetation should be restricted to the relevant infrastructure footprints only; b) Topsoil should be stored separately to be used in rehabilitation and landscaping; c) Transformation of natural areas should exclude any areas designated as having high or very high sensitivities;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
	well as the animals migrating away from the site.	d) Prevent all effluent from the mining activities from entering the wetland habitat; e) Management of the topsoil stockpile to preserve the seedbed; f) Fence development footprint area prior to commencement construction; g) No off-road driving into natural vegetation; h) Implement alien invasive species eradication program.	
Site clearance for road construction, powerlines, plant. Equipment and vehicle operations. During decommissioning phase,	Loss of soil resource and land use	a) Limiting the area of impact to as small a footprint as possible, inclusive of waste management facilities, resource stockpiles and the length of servitudes,	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		access and haulage ways and conveyancing systems wherever possible; b) Implement a soil utilization plan; c) Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction; d) Topsoil to be stripped and stockpiled separately.	
Site clearance for the construction of the processing plant and administrative offices	Increased risk of erosion	a) Minimise the construction footprint within any wetland areas. Clearly demarcate the required construction servitude and maintain all activities within the demarcated area;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		b) Maintain flow connectivity in any valley bottom wetlands during the construction phase by temporarily diverting streams around the construction area; c) Install erosion prevention measures prior to the onset of construction activities;	
Stripping, dumping activities and vehicular movements on dust roads	Increase in ambient dust levels	a) Regular watering of the site roads; b) Dressing off of tip faces, unused roads and disturbed areas; c) Minimising unnecessary disturbance of non-operational areas;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		d) Use of chemical additives to control dust to be employed if necessary.	
Trenching activities, Equipment use and vehicular activity	Increase in ambient noise levels. The noise from the mining machinery will be audible if opencast mining operations are undertaken during the night time, exceedances of all but the guidelines for industrial districts would be experienced and the noise levels at the nearest sensitive receptors would be objectionable;	a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.	High
Vehicles maintenance, fuel storage, servicing areas and construction equipment storage	Pollution of surface water Resource including wetlands due to Hydrocarbon spillages	a) Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		b) Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil; c) Spill-sorb or a similar product will be kept on site, and used to clean up hydrocarbon spills if they should occur; d) Hazardous material will be placed in bunded areas; e) Spill kits to clean up hydrocarbon spills will be available; f) Clean upslope runoff will be diverted around construction areas.	

Activity	Potential Impact	Mitigation	Potential for residual risk
		g) Prevent all effluent from the mining activities from entering the wetland habitat.	
Site Clearance for the constriction of training section and clinic and Excavation of the pit.	Potential impact on heritage Resources	a) Conduct heritage impact assessment to identify heritage sites within the project area; b) If any heritage sites are identified, appropriate steps as per the Heritage Resources Act will be undertaken; c) education and training on heritage resources will be given to mine employees	Low
Vehicular movements	Increase in traffic volumes on existing traffic network	a) Traffic signage at site access point; b) Undertake traffic impact study;	Low

Activity	Potential Impact	Mitigation	Potential for residual risk
		c) Traffic signage at site access points; d) Upgrade gravel roads to tarred roads.	
Employment	Spontaneous settlement and increased pressure on social services	a) Develop a clear and concise employment and recruitment policy that prioritizes local recruitment; b) Identify and support community development programs that address challenges raised by population influx and spontaneous settlement; c) Support local government capacity for integrated development planning.	Medium
Operational Phase			

Activity	Potential Impact	Mitigation	Potential for residual risk
Blasting, loading, hauling, stockpiling, backfilling and tailings storage and vehicle operations	Release of fugitive emissions in the form of N2O, CH4 and CO2 impact on air quality within and near the project area, particularly in the downwind direction	a) Efficiency will be applied to reduce wastage and unnecessary fuel consumption; b) Carbon offsets will be considered if required; c) Concurrent best practice rehabilitation and vegetation monitoring will be applied to allow for the restoration of some the carbon sink functionality within the mining right area.	Medium
Excavation of an open cast mine	Influx of groundwater into the pits, leading to a decrease in groundwater quality and yield	a) Detailed geological mapping to identify geological features; b) Mining will take place according to design mine stability safety factors; c) Mining will not take place in the weathered overlying strata;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		d) Identify boreholes (undertake hydrocencus) within mining area and plug deep boreholes to prevent inflow into the pit; e) Monitor groundwater levels and yields of external borehole users.	
Excavation of an open cast mine	The formation of Acid Mine Drainage in groundwater resources.	a) Optimise storage of mine water to minimize exposure to oxygen; b) Develop a groundwater monitoring program to assess the groundwater quality; c) Should Acid Mine Drainage (AMD) be identified within the groundwater resources, the polluted water will be remediated accordingly.	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
Equipment and vehicle operations	Contamination of soil	d) Spill leak detection plan should be implemented.	
Equipment and vehicle operation	Surface water and wetland resources due to hydrocarbon spills and carbonaceous material.	a) Implement storm water management plan; b) Divert clean storm water around construction areas; c) Surface water management structures be constructed first as to ensure that runoff and dirty water spills are contained;	Medium
Loading and Stockpiling	Dust generated during the mining may cause a negative visual impact and altered visibility	a) Regular watering of the site roads; b) Dressing off tip faces, unused roads and disturbed areas; c) Minimizing unnecessary disturbance of non-operational areas;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		d) Use of chemical additives to control dust to be employed if necessary.	
Blasting and vibrations	General increase in Blasting and vibrations	a) Blasting and other noise generating activities should be conducted during the day when surrounding noise levels is high.	Medium
Vehicular operation, hauling and transportation of material	General increase in ambient noise levels	a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.	Medium
Waste disposal	Waste generation including Debris (slimes), waste rock, litter and other	a) The slimes and waste rock will be used to backfill the trenches.	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
	solid waste will be generated and deposited in and around the site. This could potentially attract nuisance and affect the natural scenery of the site.	This will be undertaken in a concurrent rehabilitation manner.	
Employment	Spontaneous settlement and Increase pressure on social services	a) Develop an employment and recruitment policy that prioritises local recruitment; b) Identify and support community development programmes; c) Support local government capacity for integrated development planning.	Medium
Employment	Benefits resulting from employment and income opportunities created by the mine	a) Positive impact that needs to be enhanced.	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
Decommissioning Phase			
	Compaction of soil and contamination of soil resources	a) Reinstatement of stored soils onto areas of disturbance where infrastructure has been demolished; b) Contour and stabilize slopes to be free- draining; c) Cultivation of growing medium, the planting of required vegetative cover and irrigation if required.	Medium
Backfilling of the open cast mine	Pollution of surface water resources	a) The storm water management infrastructure, including the PCD, will be decommissioned last to ensure adequate storm water management during the rehabilitation phase;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		b) Erosion protection measures will be implemented at steep areas; c) Spill kits will available and hydrocarbon spills will be cleaned up immediately; d) All traces of hydrocarbons and residual waste will be removed before infrastructure is demolished.	
Backfilling of the open cast mine	Increase in dust fallout	a) Regular watering of the site roads; b) Dressing off tip faces, unused roads and disturbed areas; c) Minimising unnecessary disturbance of non-operational areas;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		d) Use of chemical additives to control dust to be employed if necessary.	
Hauling, Equipment and vehicular operations	General increase in ambient noise levels	a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.	Medium
Loss of employment	Loss of employment and enterprise development opportunities	a) Develop and implement Labour and Human Resources Plan (LHRP) that address the impacts associated with retrenchment, job losses and reduced demand for local goods and services;	Medium

Activity	Potential Impact	Mitigation	Potential for residual risk
		b) Develop a closure plan which will aim to reinforce the objectives of the SLP by reducing the reliance on LCM for employment by promoting skills transfer to ensure alternative livelihoods portable skills.	

19 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No specific information has been requested by the Competent Authority so far.

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix).

The proposed mining right application will present the negative and positve socio-economic impacts. Positve socio-economic conditions associated with the proposed development.

a) Creation of job opportunities assisting in the reduction of economic imbalances within the previously disadvantaged communities.
b) Economic growth of the North-West provinces through trade mechanisms and tourism
c) National increase of the GDP through mining of Vanadium, Titinium and Iron-Ore

Negative socio-economic conditions associated with the proposed development.

a) Overcrowding.
b) Relocation and loss of cattle grazing area for the herders at the Cattle post.

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate

contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

To be attached after Heritage Impact Study or Assessment

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

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation).

There is no project alternative that was considered for the Matai Mining project. As already mentioned in Section 7.2, this is because the existing mining right was obtained for the sole purpose of mining Vanadium. Titanium and Iron ore due to the availability the minerals in the study area. The No-Go option entails the continuation of the current land use (farming) on the study site proposed for the mining. The Open Cast mining will contribute towards the achievement of providing employment for the local communities, as well as boosting South Africa's economy. Should the proposed project not be authorised to proceed, it is anticipated that there mining Right opportunity will be forfeited and it would further suggest that no new employment opportunities would be created.

23 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I Charles Chigurah 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: 15 November 2022

24 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I Charles Chigurah herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of the EAP

DATE: 15 November 2022

-END-

25 REFERENCES

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