ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR COAL MINING RIGHT, INTEGRATED WATER USE LICENSE, WASTE MANAGEMENT LICENCE, AND ENVIRONMENTAL AUTHORISATION APPLICATIONS

PORTIONS (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) OF THE FARM MOOIHOEK 168 HT, PORTIONS (RE,1, 2, 3, 4) OF THE FARM KLIPSPRUIT 136 HT , FARM KLIPSPRUIT 137 HT AND PORTION RE/1, RE/2, 6, 10, 11, 13, 14,15, 16, 18, 23, 29, 30, 33 & 34 OF THE FARM KLIPSPRUIT 138 HT, LOCATED IN THE MAGISTERIAL DISTRICT OF PIET RETIEF , MPUMALANGA PROVINCE

PREPARED FOR

LAZALELIHLOKOHLOKO MINING AND PROJECTS (PTY) LTD.

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COMPETENT AUTHORITY

mineral resources & energy
Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

Regional office, Saveways Crescent Centre, Mandela Drive,
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DMRE REF: MP 30/5/1/2/2/10230 MR

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME

Application for coal mining right on Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE,1, 2, 3, 4) of the farm Klipspruit 136 HT , farm Klipspruit 137 HT and Portion RE/1,RE/2,6,10,11,13,14,15,16,18,23,29,30,33 & 34 of the farm Klipspruit 138 HT, Mpumalanga province for listed activities associated with a mining right.

Submitted for environmental authorisation in terms of the National Environmental Management Act (Act 107 of 1998), the National Environmental Management Waste Act (Act 59 of 2008) and the integrated Water Use License in terms of the National Water Act (Act 36 of 1998) in respect of listed activities that have been triggered by an application in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) (as amended)

Name of applicant	Lazalelihlohloko Mining and Projects(2010 / 009635/ 07)
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File reference number (SAMRAD)	MP 30/5/1/2/2/10230 MR

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVES OF THE SCOPING PROCESS

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

(a) Identify the relevant polices and legislation relevant to the activity.
(b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location.
(c) Identify and confirm the preferred activity and technology alternatives through an impact and risk assessment and ranking process.
(d) Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment.
(e) Identify the key issues to be addressed in the assessment phase.
(f) Agree on the key issues addressed in the assessment phase; including the methodology to be applied, the expertise required as well as the extend of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site.
(g) Identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

DISCLAIMER

The opinion expressed in this, and associated reports are based on the information provided by [Lazalelihlokohloko Mining and Projects] to Singo Consulting (Pty) Ltd ("Singo Consulting") and is specific to the scope of work agreed with Lazalelihlokohloko Mining and Projects.

Singo Consulting acts as an advisor to Lazalelihlokohloko Mining and Projects and exercises all reasonable skill and care in the provision of its professional services in a manner consistent with the level of care and expertise exercised by members of the environmental profession.

Except where expressly stated, Singo Consulting has not verified the validity, accuracy or comprehensiveness of any information supplied for its reports. Singo Consulting shall not be held liable for any errors or omissions in the information given or any consequential loss resulting from commercial decisions or acts arising from them.

Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by the Lazalelihlokohloko Mining and Projects or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Singo Consulting is both complete and accurate. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s), unless explicitly stated otherwise.

These views do not generally refer to circumstances and features that may occur after the date of this study, which were not previously known to Singo Consulting (Pty) Ltd or had the opportunity to assess.

LIST OF ABBREVIATIONS

MRA	Mining Right Area
MLM	Mkhondo Local Municipality
AMD	Acid Mine Drainage
ASAPA	Association of Southern African Professional Archaeologists
BID	Background Information Document
DEA	Department of Environmental Affairs
DEM	Digital Elevation Model
DMRE	Department of Mineral Resources and Energy
DoL	Department of Labour
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIAr	Environmental Impact Assessment report
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
GIS	Geographic Information System
GN	Government Notice
HDSA	Historically Disadvantaged South African
HIA	Heritage Impact Assessment
I&APs	Interested & Affected Party(ies)
IBA	Important Bird Area
IDP	Integrated Development Plan
IEA	Integrated Environmental Authorisation
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
LED	Local Economic Development
LoM	Life of Mine
MDARD	Mpumalanga Department of Agriculture and Rural Development
MHSA	Mine Health and Safety Act (Act 29 of 1996) as amended
MPRDA	Minerals and Petroleum Resources Development Act, 2002
MTPA	Million tons per annum
MRA	Mining Right Area
MWP	Mining Works Programme
NEM:WA	National Environmental Management: Waste Amendment Act, 2008
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)

NEMBA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NFEPA	National Freshwater Ecological Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PCD	Pollution Control Dam
PES	Present Ecological State
PoS	Plan of Study
PPP	Public Participation Process
RoM	Run of Mine
S&EIA	Scoping and Environmental Impact Assessment
S&LP	Social and Labour Plan
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SAMRAD	South African Mineral Resources Administration System
SANBI	South African National Biodiversity Institute
SANS	South African National Standard
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SEMA	Specific Environmental Management Acts
SMME	Small, Medium and Micro-Sized Enterprises
SOP	Standard Operating Procedure
SPLUMA	Spatial Planning and Land Use Management Act (Act No.16 of 2013)
SR	Scoping Report
StatsSA	Statistics South Africa
WMA	Water Management Area
WML	Waste Management License in terms of NEM:WA

1. EXECUTIVE SUMMARY

1.1. Introduction and background

Lazalelihlokohloko Mining and Projects (2010 / 009635/ 07) (the applicant) has appointed Singo Consulting (Pty) Ltd (consultant) to undertake an Environmental Impact Assessment (EIA) and Environmental Authorisation processes for the purpose of mining coal on the Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE,1, 2, 3, 4) of the farm Klipspruit 136 HT, farm Klipspruit 137 HT and Portion RE/1 ,RE/2, 6, 10, 11, 13, 14, 15, 16, 18, 23, 29, 30, 33 & 34 of the farm Klipspruit 138 HT located within the Mkhondo Local Municipality under the Piet Retief Magisterial District. DMRE Ref: MP 30/5/1/2/2(10230) MR.

The Department of Mineral Resources and Energy (Mpumalanga) granted Lazalelihlokohloko Mining and Projects (Pty) Ltd a prospecting right on the Klipspruit farms to prospect for coal, however when they requested old exploration information from The Council of Geoscience, none was available to aid in planning. As a result, a geologist (whom was employed by the applicant) conducted a field study to identify target areas for drilling in order to minimize costs based on geological expertise and assumptions. Following the successful identification of a suitable area for exploration, a drilling programme was developed in February 2012 and 23 boreholes were drilled. There is currently a coal mine operation situated approximately 310.29 m from the R543 and within the proposed MRA. The proposed MRA is located at approximately 6.10 km North of Jindal Mining (Pty) Ltd and 10.52 km South East of Kangra Coal (Pty) Ltd.

A scoping report (SR) was submitted to the DMRE Mpumalanga offices on the 27th of May 2019, we are awaiting the response from the DMRE. As per the approval letter, the Environmental Impact Assessment (EIA) phase may continue and the final EIA and EMPr should be submitted within 106 days from the date of SR approval. Accordingly, this draft EIA and EMPr are prepared and submitted for public and stakeholder review in terms of the National Environmental Management Act, 1998 (NEMA) and the National Environmental Management Waste Act, 2008 (NEM:WA) in respect of listed activities that have been triggered by applications in terms of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA) (as amended).

The Integrated Environmental Authorisation (IEA) application includes the aforementioned property where the mining right area (MRA) has an estimated life of mine (LoM) of 30 years. Further invasive drilling and exploration activities on the proposed mining right area is required and based on new geological information becoming available. This will likely result in mining layouts being updated to ensure optimal mining and utilisation of the available coal resources throughout the mining right area.

The proposed project relates to opencast mining. The mining right application covers 6071.950 ha and falls in the Utrecht coalfield. Open cast coal mining recovers a greater proportion of the coal deposit than underground methods, as more of the coal seams in the strata may be exploited.

For the proposed mine to operate, the applicant is required to submit an application for a mining right to the DMRE. In support of the application to obtain the mining right, the applicant is required to conduct a

Scoping and Environmental Impact Assessment (S&EIA) that must be submitted to the DMRE for adjudication. The S&EIA must include activities triggered under the EIA regulations of 2014 (as amended) promulgated under the NEMA, as well as activities triggered under the NEM:WA.

1.2. Scoping and Environmental Impact Assessment process

An S&EIA is conducted in two phases: The first phase is scoping, and the second phase is the EIA/EMPr report compilation. The scoping phase will commence once the application has been submitted with the competent authority and will include the following activities:

- Identify interested and affected parties (I&APs) and stakeholders
- Identify relevant policies and legislation
- Consider the need and desirability of the project
- Consider alternative technologies and sites
- Identify potential environmental issues
- Determine the level of assessment and public participation required for the EIA phase
- Identify preliminary measures to avoid, mitigate or manage potential impacts.

The objectives of the EIA phase include assessing the potential impacts associated with the preferred project alternatives as per the terms of reference for the assessment set out in the SR. The EIA/EMPr will document the assessment findings and detail the measures required to avoid, mitigate and/or manage potential impacts.

The requirements for the S&EIA process are detailed in Chapter 4 Part 3 of the NEMA Reg No 517 (amended 11 June 2021). The EIA process can take up to 300 days to complete (87 days for scoping phase, 106 days for EIA phase and 107 days for competent authority review). This draft EIA is currently in the 106-day EIA phase and will be submitted to the DMRE for final decision making after the 30-day stakeholder review period. See the following table for the project applicant details.

Table 1: Project applicant details.

Name of applicant	Lazalelihlohloko Mining and Projects (2010 / 009635/ 07)
Tel no	+27 68 342 6983
E-mail	wlmprojects@gmail.com
Fax	+27 86 5144 103
Postal address	Flat 402 Isolde Flats 192 Justice Mohamed Street Sunnyside

	Gauteng 0001
Physical address	Flat 402 Isolde Flats 192 Justice Mohamed Street Sunnyside Gauteng 0001
File reference number (SAMRAD)	MP 30/5/1/2/2/10230 MR

1.3. Project location

The mining right area is located on Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE,1, 2, 3, 4) of the farm Klipspruit 136 HT , farm Klipspruit 137 HT and Portion RE/1, RE/2, 6, 10, 11, 13, 14, 15, 16, 18, 23, 29, 30, 33 & 34 of the farm Klipspruit 138 HT. The farm falls in the jurisdiction of Mkhondo Local Municipality in Mpumalanga province.

The site is 6071.950 ha in extent and the overall extent of the area is approximately 6071.950 ha and is located approximately 6.20 km South East of KwaNgema, 11.63 km south east of Driefontein, 17,19 km South East of St Helena and 16.19 km South east of Brereton. The project area is surrounded by a plantation, Mining activities and small villages. The area is currently utilised for farming activities, specifically the crop farming activities and plantation see locality map below. The area is not mine-dominated, but there are infrastructures like roads and powerlines. See **Figure 1**.

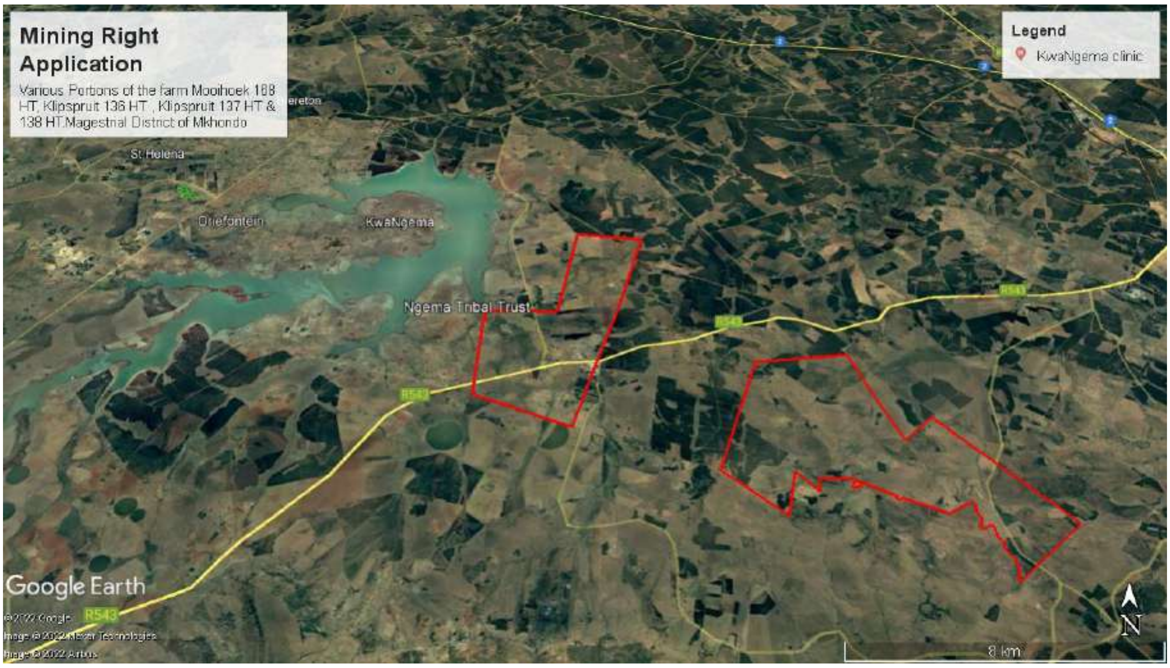

Figure 1 : Project locality map.[Singo Consulting,2022].

1.4. Project overview

The mining right application covers 6071.950 ha and falls in the Utrecht coalfield. The boxcut is classified as an Indicated Coal Resource (the entire project is also referred to as such) as per the SAMREC code.

The generally low strip ratios and wide water

area of the project area makes it ideal for the opencast truck and shovel mining method. This mining method applicability is driven by technical applicability, economic viability, safety, equipment and infrastructure. The proposed mining method and sequence comprise the following main mining activities for waste and coal:

- Initial topsoil and soft overburden removal, which will be stockpiled to ensure it can be placed back in the initial box cut
- Physical mining of the coal seam, including drilling of hard overburden material, charging and blasting
- Loading of coal onto trucks and hauling thereof to the crushing and screening facility
- Discard coal will be extracted and replaced in the bottom of the open cast, while the product will be taken to the weighbridge via trucks and then moved off-site.
- The overburden is placed back into the box cut as mining progresses, leaving a minimum area open at a single time. Formally known as concurrent rehabilitation.
- The topsoil, which was stripped and stockpiled separately before mining commenced, is then replaced. The findings of the land capability study will determine the optimal composition to ensure pre-mining conditions for utilization.

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

Key infrastructure includes:

- Access and haul roads (with necessary security), including the upgrading of the access point to the gravel road
- Offices with septic/chemical ablution facilities
- Weighbridge, workshop and stores (with septic/chemical ablution facilities)
- Diesel facilities and a hardstand
- Powerlines and water pipelines
- Box cut
- Stockpiles (topsoil, overburden, subsoil/softs, run of mine (RoM))
- Surface water management measures (stormwater diversion berms and trenches, pollution control dams, tailings dam, etc.)
- Crushing, screening and wash facility
- Coal wash plant

The LoM for the project is 30 years, including the anticipated construction period and decommissioning and rehabilitation phase.

1.4.1 Alternatives

The identification and investigation of alternatives is a key aspect during the EIA, which was initially investigated during the scoping phase. All reasonable and feasible alternatives must be identified and assessed during the EIA phase to determine the most suitable or preferred development footprint. There are some significant constraints that have to be taken into account when identifying alternatives for a project of this scope. The preferred option is to be highlighted and presented to the authorities.

Alternatives can typically be identified or categorised according to:

- Location alternatives: Alternative project sites in the same geographic area
- Process/design alternatives: Alternative process/design/equipment/technologies
- Associated infrastructure location and layout alternatives: Consideration of the different options to place project infrastructure
- Activity alternatives: Consideration of different means to achieve the same project objective
- No-go alternatives: The proposed project/activity does not proceed, implying that the status quo remains

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

The study area was considered due to the positive results obtained during the prospecting phase and exploration drilling with regards to the underlying coal conducted in February 2012. Twenty-three Boreholes were drilled with some of them intersecting the coal seams.

Several layout alternatives were considered; the preferred one is indicated in this report.

The No-Go alternative entails not mining the coal reserve and leaving the area mainly as agricultural land. The dominating land-use on-site is cattle and forestry. Food and water security is undoubtedly one of the most important considerations in Mpumalanga and over the world, with agriculture contributing to South Africa's gross domestic product (GDP). This means that all potential negative impacts associated with the proposed mine and its associated infrastructure would not occur. However, by not implementing this project, 83 permanent jobs and unskilled jobs will not be created and the coal which could potentially have benefitted the economy would remain unutilised. South Africa has been slow to adapt renewable energy sources. As such, coal will still be a necessary and dominant energy source for the next 12-32 years, playing a significant role in the country's economy. Over 90% of the coal consumed in Africa is produced in South Africa. Coal mining in South Africa is centred on the Highveld, with roughly 60% of the country's deposits located in eMalahleni (Witbank) and surrounding areas. Not implementing the project means increased problems with regards to Eskom's service delivery, which is dependent on coal.

1.1.1. Need for and desirability of the project

The *Integrated Environmental Management Guideline Series 9: Guideline on Need and Desirability* was promulgated in terms of the EIA. According to these guidelines, the consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the proposed project along with the broader public interest and societal needs. The guidelines further state that the development must not exceed ecological limits and the proposed actions must be measured against the short-term and long-term public interest to promote justifiable social and economic development, ensuring the achievement of the triple bottom line (social, economic and environmental aspects).

The following section will examine the need for and desirability of the proposed Coal Mine project, as well as the importance of coal as a mineral resource and the desirability of coal mining operations at the proposed study area.

Mining activities are essential to South Africa's economic development (Chamber of Mines of South Africa's Integrated Annual Review, 2018). The following figure illustrates the essential components of mining in South Africa.

Figure 2: Mining contribution summary in 2018.

The mining sector accounted for 6.8% of South Africa's GDP in 2017 and 7.3% in 2018, contributing R335 billion and 356 billion to GDP respectively. Due to higher mining production, employment is estimated to have increased by 1.6% to 464,667 in 2017 and 4% in 2018, with a decrease in 2019 due to constant retrenchments and shut-down of many operations in South Africa. This eventually arrested the rate of job losses, which was approximately 30,000 between 2014 and 2018 (an increase in this figure was anticipated for 2019). While the employment created from 2008-2018 was high, the retrenchments at the end were higher (see the following figure).

According to the National Development Plan ("NDP"), education, training and innovation are central to South Africa's long-term development. They are the core elements in eliminating poverty, reducing unemployment and inequity, and serving as foundations of an equal and prosperous society as envisioned in the Constitution. Education empowers people to:

- Define their identity
- Take control of their lives
- Raise healthy families
- Take part confidently in in developing a just society
- Play an effective role in community politics and governance

The Mkhondo Local Municipality comprises of 32 Wards and a total population of approximately 378 481 (CS 2021). The municipality has an area of approximately 2,384 km².

According to Mkhondo Local Municipality's IDP 2020-2021, the local population had 2.1% growth rate per annum which led from 171 982 in 2011 to 189 036 in 2016. Mkhondo Local Municipality is mostly dominated by African black people, followed by coloured people, indian or Asian and white people from 1996 to 2016. Mkhondo has an HDI of 0,53 which then falls within the United Nations Category of Low Human Development. Mkhondo local Municipality ranks very low compared to other local municipalities in Mpumalanga Province. Mkhondo local Municipality's Gini coefficient has remained at 0.58 in 2011 and 2015 (Stats SA). With reference to Stats SA (2016) the number of people not older than 21 years, without parents has decreased from 7112 in 2011 to 4602 in 2016. The number of people with 'no schooling' has declined from 2001 to 2011, mean while those with matric has increased. According to the Final MLM Draft SDF (2016) the settlements with the lowest education level are Ngema Tribal Trust, Mkhondo Non-urban, Saul Mkhizeville and KwaNgema. These are the settlements that are located in close proximity to traditional areas or informal settlements with the highest education levels are eMkhondo, Iswepe and Amsterdam (UP Enterprise, 2016).

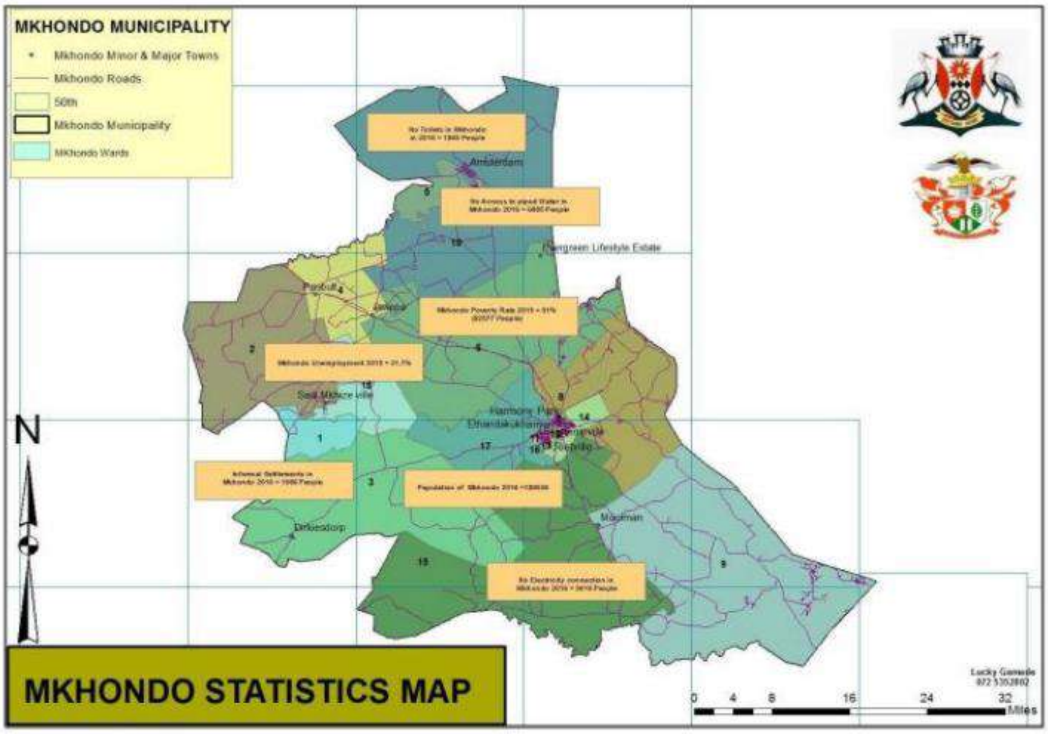

Figure 3: Mkhondo Local Municipality Statistics Map.[MLM IDP,2017 - 2022].

Population Distribution of MLM

The population of Mkhondo increased from 171 982 in the year 2011 to 189 036 in 2016. The population increased with approximately 17054 individuals. When a population increases,this is directly proportional to the number of houses in the same region hence there was an increase of 8 162 in the number of households from 37 433 in 2011 to 45 595 in 2016. The number of households living in RDP houses and in informal settlements also increased. Not everyone can afford to purchase or build for themselves a formal and proper house.

Table 2: Population distribution of Mkhondo Local Municipality (Mkhondo Local Municipality (IDP), 2017-2022)

	2011	2016
Population	171 982	189 036
Number of Households	37 433	45 595
Households living in RDP House	10 342	11 733
Households in Shacks within Informal Settlements	642	1086

Racial Composition

According to Mkhondo Local Municipality IDP 2017-22, the Black African Race dominates the footprint of MLM mean while the population of Whites and Indians/Asian race decreased from 2011 to 2016. In areas such as Amsterdam, there has been a shift in racial composition, with the white population declining from 37,4% of population in 2001 to 7,4% in 2011 and the black population increasing from 60,1% in 2001 to 90,4 % in 2011.

Table 3: Racial Composition of MLM (Mkhondo Local Municipality (IDP), 2017-22).

RACE	1996	2001	2011	2016
Black African	91 554	136 523	162 322	185 025
Coloured	502	587	894	1232
Indian/Asian	1063	773	1417	670
White	6750	5195	6447	1880

Education

The average number of people with no schooling in MLM has fluctuated from an increase from 18 000 in 1996 to a declined from 22 806 in 2001 to 15 914 in 2011 and to an increase from 2011 to 38 045 in the year 2016. The average number of people with grade 7, grade 12 and higher than grade 12 has kept an increasing trend from the year 1996 to 2016.

Table 4: Education Background Stats of MLM (Mkhondo Local Municipality (IDP), 2017-2022).

EDUCATION BACK-GROUND	1996	2001	2011	2016
No Schooling	18 000	22 806	15 914	38 045
Grade 7	3 360	4 304	4 543	7880
Grade 12	5 594	8 674	22 600	30841
Higher than Grade 12	1 759	2 411	4 575	

GVA Contribution

According to the Mkhondo Local Municipality, the biggest contribution comes from community services. Mining contributes 11.9% of the GVA Contribution of Mkhondo Local Municipality.

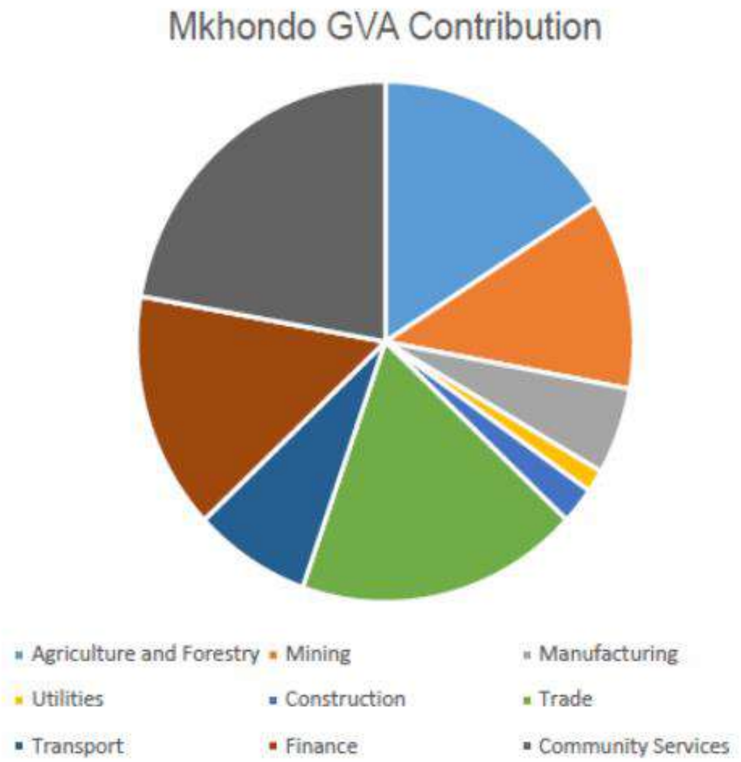

Figure 4: GVA contribution with MLM (Mkhondo Local Municipality (IDP), 2017-22)

Table 5: GVA contribution within Mkhondo Local Municipality (Mkhondo Local Municipality (IDP), 2017-2022).

INDUSTRY	MKHONDO
Agriculture and Forestry	16
Mining	11.9
Manufacturing	5.4
Utilities	1.4
Construction	2.3
Trade	18.4
Transport	7.6
Finance	14.8
Community Services	22.2
Total	100

Unemployment and Employment Levels

With reference to the IDP 2017-22, unemployment decreased from 2001 to 2011. Unemployment rate decreased from 33.3% in 2011 to 29.3% in 2016.

Table 6: Unemployment rate statistics (Mkhondo Local Municipality (IDP), 2017-2022)

UNEMPLOYMENT RATE	1996	2001	2011	Unemployment rate 2011 (%)	Unemployment rate 2016 (%)
Employed	21 550	24 216	30510		
Unemployed	10 524	20 476	17 123	33.3 %	29.3%

Sources: STATS SA

Water Provision

According to Mkhondo Local Municipality IDP 2017-2022, 17% of the population obtain water from streams, rivers, and boreholes and the 83% is water provided by the municipality to the community. Below are the Statistics obtained from Stats SA regarding access to water and water provision.

Table 7: Water Provision (Mkhondo Local Municipality (IDP), 2017-2022).

2011		2016	
Inside dwelling	11556	Inside dwelling	11556
Inside the yard	10371	Inside the yard	10371
Access point outside the yard	7467	Access point outside the yard	7467
No access to piped water	8039	No access to piped water	8039

1.1.2. Public participation process

A public participation process (PPP) was initiated during the scoping phase, which is central to the investigation of environmental and socio-economic impacts. It is important that stakeholders who are affected by the project are given an opportunity to identify concerns and to ensure that local knowledge, needs and values are understood and taken into consideration as part of the impact assessment process. These concerns and comments were addressed in the SR submitted to the competent Authority (DMRE) on the 27th of May 2019.

Objectives of public participation:

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

This draft EIA will be submitted for public review for a period of 30 days. All comments received will be incorporated into the final EIA that will be submitted to the DMRE. The draft EIA will be available for review at the location listed below and is also available from Singo Consulting as soft/electronic copies available upon request:

Piet Retief Public Library (Now called Mkhondo Public Library): Cnr Silliers & Van Rebeeck Str

MLM: Cnr Samuel & Van der walt str

1.1.3. Purpose of this report

The purpose of the EIA is to ensure that potential environmental and socio-economic impacts associated with project are identified, assessed and appropriately managed. Various specialist studies are undertaken during the scoping phase, including:

- Soil, land capability, agricultural potential and hydropedology assessment
- Surface water assessment
- Hydrogeological (groundwater) assessment
- Wetland delineation and impact assessment (PES and EIS)
- Heritage and palaeontological assessment
- Socio-economic assessment/social and labour plan

Planned studies that are incorporated in the EIA include:

- Blasting and vibration assessment
- Traffic assessment
- Hydropedological study
- Waste classification (IWWMP)
- Rehabilitation, decommissioning and closure assessment
- Civil engineering pollution control dam designs and storm-water management plan
- Mine work programme
- Agricultural input assessment

A summary of impacts identified include:

- Surface and groundwater contamination
- Wetland habitat loss and associated habitat for fauna and flora
- Impact on sensitive heritage features including graves and historical buildings
- Removal of natural vegetation and fragmentation of habitats
- Faunal displacement and mortality
- Loss of species of conservation concern
- Dust emissions
- Soil contamination and loss of soil resources
- Loss of high agricultural potential land
- Land use conversion (agricultural to mining)
- Noise and vibration nuisance
- Decant of water and AMD (post-closure)
- Direct and indirect job creation
- Economic stimulation and growth
- Community based projects which benefits the community
- Increased traffic volumes
- The mine employing a small number of people

Table 2: Summary of impact assessment

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Surface and groundwater		
Ground and surface water contamination	Negative	• Prevention of contaminated surface run-off, which might impact the water resource used by downstream users. • Hazardous chemicals must be stored in a bunded facility. • Handling of such chemicals must be undertaken on a non-permeable surface. • All hydrocarbons, lubricants and explosives must be adequately stored and bunded off to prevent groundwater contamination during an accidental spill. • All water that may collect in an area used for the storage of hydrocarbons must pass through an oil water separator before being discharged as dirty water. • Spillages on open soil must be contained, removed and treated as hazardous waste. • Emergency response plan to be put in place for spillages. • Storage facilities must be inspected regularly. • Implement effective concurrent rehabilitation of the open-cast pit area. • Long-term management of mine-affected water, including potential decant to form part of the mine's water management strategy.
Wetland/river/ hydrology/ geomorphology	Negative	• Mining across wetlands/rivers should be restricted to low-flow period (dry winter season) if possible. Ensure that mining activities are carefully monitored to limit unnecessary impacts to wetlands/riparian areas (particularly in-stream habitat). • Do not lower the original stream bed/profile of the wetland/river as this may result in scouring in an upstream direction and further alteration of bed conditions. • Ensure that coarse immovable material, including boulders and other rock in river channels, is not removed to ensure continued stability and functioning of the river systems. River sediments should not be permanently removed from the system in any case. • Limit activities occurring in the in-stream channel areas. • Under no circumstance should consideration be given to the excavation of an artificial channel or the damming of wetlands or rivers in such a manner as to totally restrict the flow. • Excavated material/sediments/spoil from the mining zone (including any foreign materials) should not be placed or stockpiled in wetlands or river channels, including the riparian zone of streams/rivers.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• Any abstraction of water from rivers/wetlands for construction purposes must be approved by the Department of Water and Sanitation (DWS) by means of Water Use License (WUL).
Potential reduction of catchment yield of the aquifers through dewatering	Negative	• Regularly monitor groundwater levels as per the recommendations of the geohydrological report.
Excavated materials that are stockpiled in incorrect areas can interfere with the natural drainage, cause sedimentation and water pollution	Negative	• The areas excavated must have vegetated berms to separate dirty and clean water systems and serve as an erosion control measure. • The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams, and surface water resources. • Upslope diversion and down-slope silt containment structures should be constructed. • Surface water resources must be monitored pre-mining and during construction, as per the monitoring programme.
Terrestrial ecology		
The clearance for the construction of the proposed structures and infrastructure will result in habitat loss	Negative	• Keep the footprint of the disturbed area to the minimum and designated areas only. • Unnecessary vegetation clearing should be avoided. • Ensure rehabilitation plans are initiated during and after construction in areas not affected by mining operations. • Vegetation clearing on slopes must be minimised and, where necessary, appropriate stormwater management must be put in place to limit erosion of exposed soil. • No harvesting of indigenous tree species for firewood should be permitted. • Environmental induction for all staff members must be mandatory to discuss the potential of fire, e.g. only smoking in designated areas and no open cooking fires. • All licences must be obtained prior to mining. • All ablution facilities must be placed far away from the water bodies, including their buffer zone (500 m from watercourses). • When placing structures in the mining area, high sensitive areas must be avoided. • An alien and invasive management plan, and emergency preparedness plan during spillages must be adhered to at all times. • Rehabilitation of cleared/mined areas to avoid or limit erosion.
Displacement of flora and fauna species of	Negative	• SCC should be relocated or protected in situ, depending on the species in question and the decision of the CA.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
conservation concern (SCC)		• Set aside areas allowing for continued existence of SCC. • Adjust proposed mine's layout design to exclude sensitive areas. • Keep the footprint of the disturbed area to the minimum and in designated areas only. • An environmental induction for all staff members must be mandatory to discuss impacts like the presence of SCC, which may not be damaged, caught or removed without a permit.
Accidental introduction of alien species and invaders	Negative	• Eradication and/or control of alien invasive plants and weeds as per the alien and invasive species monitoring programme. • Avoid disturbance of natural areas as possible and control the spread of alien flora into natural areas. • Continuously monitor the growth and spread of alien and invasive flora, coupled with an adaptive management approach to identify suitable control mechanisms (e.g. mechanical, chemical or biological control). Mechanical control is usually preferred. • Clean vehicles and equipment before entering natural areas to remove large deposits of foreign soils and plant material.
Faunal mortalities	Negative	• Environmental induction for all staff members must be mandatory to discuss issues related to the killing and/or disturbance of faunal species, which should be avoided. • Several staff members must complete a snake-handling course to safely remove snakes from designated areas. • Road mortalities should be monitored by vehicle operators (for personal incidents only) and the ECO (all road kill on a periodic monitoring basis and specific incidents) with trends being monitored and reviewed as part of monthly reporting. Monitoring should occur via a logbook system where staff notes the date, time and location of the sighting/incident. This will allow determination of the locations where the greatest likelihood exists of causing road mortality and allow mitigation against it (e.g. fauna underpasses, and seasonal speed reductions). Mitigation must be adapted to the on-site situation which may vary over time. • All staff operating motor vehicles must undergo an environmental induction training course that includes instruction on the need to comply with speed limits, to respect all forms of wildlife (especially reptiles and amphibians) and, where possible, prevent accidental fauna road kills. Drivers not complying with speed limits should be subject to penalties. • The proposed prospecting activities will result in the deaths of numerous fauna species. It is suggested that construction and mining operations occur from a predetermined area and move along a gradient to allow fauna species to relocate.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• The ECO must monitor live animal observations to detect trends in animal populations and implement proactive adaptable mitigation of vehicle movements. • Should holes or burrows be located on-site, contact a zoological specialist to investigate and possibly remove any species located in them. • Where possible, barriers around excavation sites must be erected to prevent fauna from falling into excavations. • The area surrounding the bulk sampling operation must be demarcated and fenced-off to restrict animals from moving into the area, and to reduce fauna mortalities.
Vegetation and fauna management		• Keep the clearing of natural vegetation in wetland areas to a minimum and attempt to ensure that clearing occurs in parallel with the mining progress where possible. • Limit mining equipment operating in wetland/riparian areas to that needed to be cleared. • Temporary noise pollution due to mining works must be minimised in sensitive areas by ensuring proper maintenance of equipment and vehicles and turning off engines and mufflers, as well as employing low-noise equipment where possible. • No wild animal may under any circumstance be hunted, snared, captured, injured, killed, harmed or removed from the site. This includes animals perceived to be vermin. • Any fauna that are found within the mining corridor should be moved to the closest point of natural or semi-natural vegetation outside the mining corridor. A specialist may need to be used for dangerous/venomous species such as snakes.
Geology and soils		
Land use change which will affect the soil and land use capability during construction and post-mining operations. Loss of agricultural soils and land expected.	Negative	• Should the No-Go alternative not be considered, mining activities must be located on low-medium agricultural potential land to minimise impacts. • Compensate landowners. • Rehabilitate areas disturbed by mining to return land to arable land where feasible. If not, other land uses (decommissioning phase) deemed socially, economically or environmentally applicable, must be considered.
Site clearance and levelling during the construction phase will create additional exposed areas and could trigger erosion and siltation,	Negative	• Prevent soil loss through erosion. • Develop appropriate storm water management system to control surface run-off over exposed areas. • Preserve soil fertility for later use. • Ensure all vehicles stay in the designated areas (for example, away from watercourses).

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
especially during rainy periods		• Plan to construct the majority of development during the dry winter months. • Establish temporary erosion and sedimentation trapping control measures during the construction phase
Storage of topsoil	Negative	• Remove and stockpile topsoil from roads, building platforms, stockpile and dam areas prior to construction. • Preserve topsoil and store in an appropriate manner to maintain viability and seed bank for future rehabilitation. • Store away from watercourses to prevent sedimentation and erosion. • Protect from alien plant establishment.
Soils and sediment management	Negative	• Where possible, mining activities in rivers and wetlands must proceed during dry winter months (low or zero-flow periods) to limit the potential for erosion linked to high run-off rates. • All soil stockpiles must be placed in an up-slope direction from the trench so that that any surface wash is directed into the trench and not further down-slope. • Any erosion points created during mining activity construction must be filled and stabilised immediately. Stockpiles must be protected from erosion, stored on flat areas where possible, and surrounded by appropriate berms. • No stockpiling of soils or materials should take place in a watercourse, including wetlands and the riparian zone of streams/rivers. • Periodic visual inspections of on-site water quality, identifying the source of any rapid increases in turbidity of surface waters and remediation of this where necessary (by a qualified Environmental Officer). Water must be pumped out into a well-vegetated area some distance from any watercourse to facilitate sediment trapping and reduce the chance of sediment entering wetlands/streams. • Excavated and imported material must be stored away from stream lines/areas of concentrated flow to limit the risk of sediment wash to downstream areas. • Any topsoil removed from wetlands must be stockpiled separately from subsoil material and replaced once mining is complete to facilitate re-colonisation of the site. • Stripped topsoil from wetlands must not be buried or in any other way be rendered unsuitable for further use by mixing with spoil or subjected to compaction by machinery. • Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. The channel embankments must be rehabilitated to ensure both longitudinal and cross-sectional stability against summer floods.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Pollution		
Waste management/ pollution control	Negative	• Storage of potentially hazardous materials (e.g. fuel, oil, etc.) should be outside of the 100-year flood line, or within a horizontal distance of 500 m from a watercourse or wetland. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas. • Operation and storage of machinery and mining-related equipment must be done outside of wetlands and rivers wherever possible, unless authorised by a Water Use License (WUL). • Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of in the natural environment). Any contaminated soil from the site must be removed and rehabilitated timeously and appropriately. • Mechanical plant and bowsers must not be refuelled or serviced in or directly adjacent to any watercourse (including river and wetlands). • Provide adequate waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment, but to use available facilities. • Ensure that any rubbish is regularly cleared from the site, especially from wetlands/streams. • Routinely check machinery/plant for oil or fuel leaks each day before mining activities begin. No stockpiling must take place in a watercourse, including wetlands and the riparian area of the river. • Sanitation. Portable toilets (1 toilet per 30 users is the norm) to be provided where mining occurs. Workers must be encouraged to use these facilities and not the natural environment. Toilets must be located outside of the 1:100 yr. flood line of a watercourse or 500 m or from any natural water bodies, including streams and wetlands. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.
Social		
Recruitment strategies for the mine	Positive	N/A
Advantage to previously	Positive	N/A

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
disadvantage individuals		
Community development programmes	Positive	N/A
Upgrades and expansion of services will benefit local area	Positive	N/A
Increased income generation for local community	Positive	N/A
Increased job opportunities for local mining communities	Positive	N/A
Noise		
Noise emanating from heavy machinery and transport vehicles	Negative	• Noise barriers in the form of berms should be constructed as close to the noise sources as possible. • Mining-related machines and vehicles must be serviced regularly to ensure noise suppression mechanisms are effective, e.g. installing exhaust mufflers where possible. • Noisy machinery must be used predominately during daylight hours. • Grievance mechanism to record complaints should be kept on site and investigated. • Regular noise monitoring to take place.
Noise from blasting	Negative	• Blasting operations are generally intermittent and should be limited to the day when ambient noise levels are highest.
Infrastructure (e.g. contractor's yard, weighbridge, workshop and stores)	Negative	• To reduce the visual impact of permanent structures, colours for roofing, walls, etc. should have a matt finish to reduce reflection. • Infrastructure must be located away from sensitive and elevated areas.
Location of stockpiles, pollution control dams and discard dumps	Negative	• Place as far away as possible from roads and settlements. • Topsoil stockpiles must be vegetated as soon as possible, to reduce erosion and decrease visual disturbance. • Keep stockpiles as low as possible to reduce visual impact. • Plant fast-growing indigenous trees around the dams to enhance visual.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Lighting pollution	Negative	• Avoid up-lighting of structures. Rather direct the light downwards and focus it on the object to be illuminated. • Use non-UV lights where possible, as light emitted at one wavelength is less attractive to insects. This will reduce the likelihood of attracting insects and their predators in the site camps. • ‘’Noise level discussions must be undertaken.
Heritage and cultural		
Heritage resources disturbed/destroyed	Negative	1. From a heritage perspective, supported by the findings of this study, the proposed mining development and associated developments are feasible. However, the proposed mining development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed sites. 2. The recorded burial site must be demarcated by a danger warning sign and clearly marked to avoid any accidental damage by heavy mining equipment and haulage trucks. 3. The applicant must ensure that the descendants of the recorded graves are sought and notified that the proposed mining development has an impact (directly or indirectly) on their burial site. 4. No stone robbing or removal of any material is allowed. Any disturbance or alteration to this burial site would be illegal and punishable by law, under Section 36(3) of the NHRA. 5. Contractors and workers will be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51. (1). 6. Any measures to cover up the suspected archaeological material or collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement of the SAHRA. 7. The footprint impact of the proposed mining development and associated infrastructure must be kept to a minimum to limit the possibility of encountering chance finds. 8. Should any unmarked burials be exposed during mining, affected families must be tracked and consulted and relevant rescue/relocation permits must be obtained from SAHRA before any grave relocation can take place. A professional archaeologist must be retained to oversee the relocation process in accordance with the NHRA. 9. Should chance archaeological materials or human burial remains be exposed during mining work on any section of the proposed mining development laydown sites, work should cease on the
Paleontological sites disturbed/destroyed	Negative	
Cultural places disturbed/destroyed	Negative	

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimise disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA. 10. The project PPP must ensure that any cultural heritage related matters for this project are given due attention when they arise and are communicated to PHRA throughout the proposed project development. This form of extended community involvement would pre-empt any potential disruptions that may arise from previously unknown cultural heritage matters that may have escaped the attention of this study. 11. Subject to the recommendations made herein and the implementation of the mitigation measures and adoption of the project EMP, there are no other significant cultural heritage resources barriers to the proposed mining right application. The heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations made.
Traffic		
Increased traffic volumes on the existing road networks	Negative	• Implement speed limits and safety controls on-site. • Construct access roads in safety limits from other crossings. • Possible road upgrades where required. • Create safe environment for pedestrians, animals and motorists. • Create fauna underpasses where necessary (e.g. bridge crossings).
Blasting and vibration		
Blasting and vibration	Negative	• Pre-blast survey of all structures in the mining area. • Ground vibration survey in the form of a signature trace study to be done for determination of ground vibration constants that can be used for accurate ground vibration prediction. • Investigate the possibility of alternative methods to blasting.
Safety		
Blasting	Negative	• Clearly demarcate areas and erect signs to indicate blasting zones.
Roads and vehicles	Negative	• Speed limits must be in place on site and before access roads on a provincial or national road. • Ensure drivers are trained in road safety.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Surrounding neighbours	Negative	• Personnel are not permitted on other properties without permission. • Avoid conflict with surrounding landowners. • Safety specialist will be appointed and assessments will be conducted. Recommendations will be implemented.
Air quality		
Dust pollution	Negative	• The removal of vegetation will be minimised during stripping to reduce the effects of dust pollution due to exposed soil. • Water or dust control agents must be used in working areas, and roads will be sprayed for dust suppression on a regular basis in designated susceptible areas during heavy usage. • Dust monitoring must be undertaken in accordance with the monitoring programme. It is recommended that topsoil stockpiles be vegetated to sustain biological components and prevent dust emissions. • Reduction of dust fallout levels and particulate matter. • All coal haul trucks must be covered with a tarpaulin. • The overland conveyor belt should be covered and coal on the conveyor should be sprayed to reduce emissions. • ‘’Air quality discussions must be undertaken.

1.5. Conclusions and recommendations

Various specialist studies were undertaken during the EIA phase of the project with the objective of identifying and weighing anticipated impacts and risks associated with the activities. The findings of the impact assessment have shown that the project will have some (minimal) adverse impacts on the receiving environment. All the wetlands showed a Moderate (C) level of importance for the Ecological Integrity & Sensitivity. The Hydrological Functional Importance was rated to be Highly important with a (B) rating for HGM 2 and Moderately important (C) rating for HGM 1. The sub-surface flows and groundwater movement are of importance within the local catchment; mining should consider these flow paths. The Direct Human Benefits were rated as Marginally (D) important. A minimum buffer zone of 50m, with mitigations, was determined for the wetlands within project area. The proposed project poses a high-moderate threat to the wetland areas in the current state. The infrastructure plan must continue to exclude areas up to 80m around the wetland areas. This includes the 500 m buffer zone and an additional 30m buffer protection zone which will alleviate pressures on the wetland and buffer zones

Other significant impacts include increased sedimentation of surface water resources, which may impact aquatic biota, reduce catchment yields, generate nuisance noise, cause dust and visual impacts and result in the loss of natural vegetation and, possibly, species of conservation concern. Where possible, mitigation and management measures, no-go areas (by applying applicable buffer zones), as well as further recommendations have been provided by specialists, which will reduce the significance of impacts to medium or low significance. Monitoring plans, which should be implemented throughout the LoM, have been provided to ensure that adverse impacts are identified and continuous improvements are developed. The recommendations are disclosed in the specialist studies.

If the proposed project is authorised, some positive socio-economic impacts will be realised at local, regional and national level. Nationally, the project will contribute to coal requirements to meet the demand for electricity supply, and result in knock-on benefits like tax contributions. At regional and local level, the project has the potential to improve local socio-economic profiles through job creation, Small, Medium and Micro-Sized Enterprises (SMME) development and skills development.

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1 INTRODUCTION AND BACKGROUND

Lazalelihlohloko Mining and Projects(the applicant) has appointed Singo Consulting (Pty) Ltd (consultant) to apply for Water Use License (WUL) with request ref CT10872, as well as the Waste Management License (WML) and to undertake an Environmental Impact Assessment (EIA) and Environmental Authorisation processes for the purpose of mining coal on the Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE,1, 2, 3, 4) of the farm Klipspruit 136 HT , farm Klipspruit 137 HT and Portion RE/1, RE/2, 6, 10, 11, 13, 14, 15, 16, 18, 23, 29, 30, 33 & 34 of the farm Klipspruit 138 HT located within the Mkhondo Local Municipality under the Piet Retief Magisterial District. DMRE Ref: MP 30/5/1/2/2/(10230) MR.

A Scoping Report (SR) for this application was submitted to the DMRE on the 27th of May 2019 for adjudication. After the submission of the scoping report to the DMRE, the following step of this application which is the Environmental Impact Assessment (EIA) phase may continue and the EIA and EMPr should be submitted within 106 days. Accordingly, this EIA & EMPr is prepared and submitted for public and stakeholder review in terms of the National Environmental Management Act (Act 107 of 1998), the National Environmental Management Waste Act (Act 59 of 2008) and the integrated Water Use License in terms of the National Water Act (Act 36 of 1998) in respect of listed activities that have been triggered by an application in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) (as amended).

The Integrated Environmental Authorisation (IEA) application includes the aforementioned property with the estimate life of mine (LoM) of 30 years. The proposed mining operations proposed to the mine include open cast mining. The total area of approximately 6075.950 ha will be affected by the proposed mining right activities. The Coal Deposit to which the application relates occurs in the Utrecht coalfield. The approximate depth of the mineral below surface is 21 m for the first coal seam (Dundas) and 52.58 m for the second coal seam (Targas) as confirmed in the CPR of this proposed application.

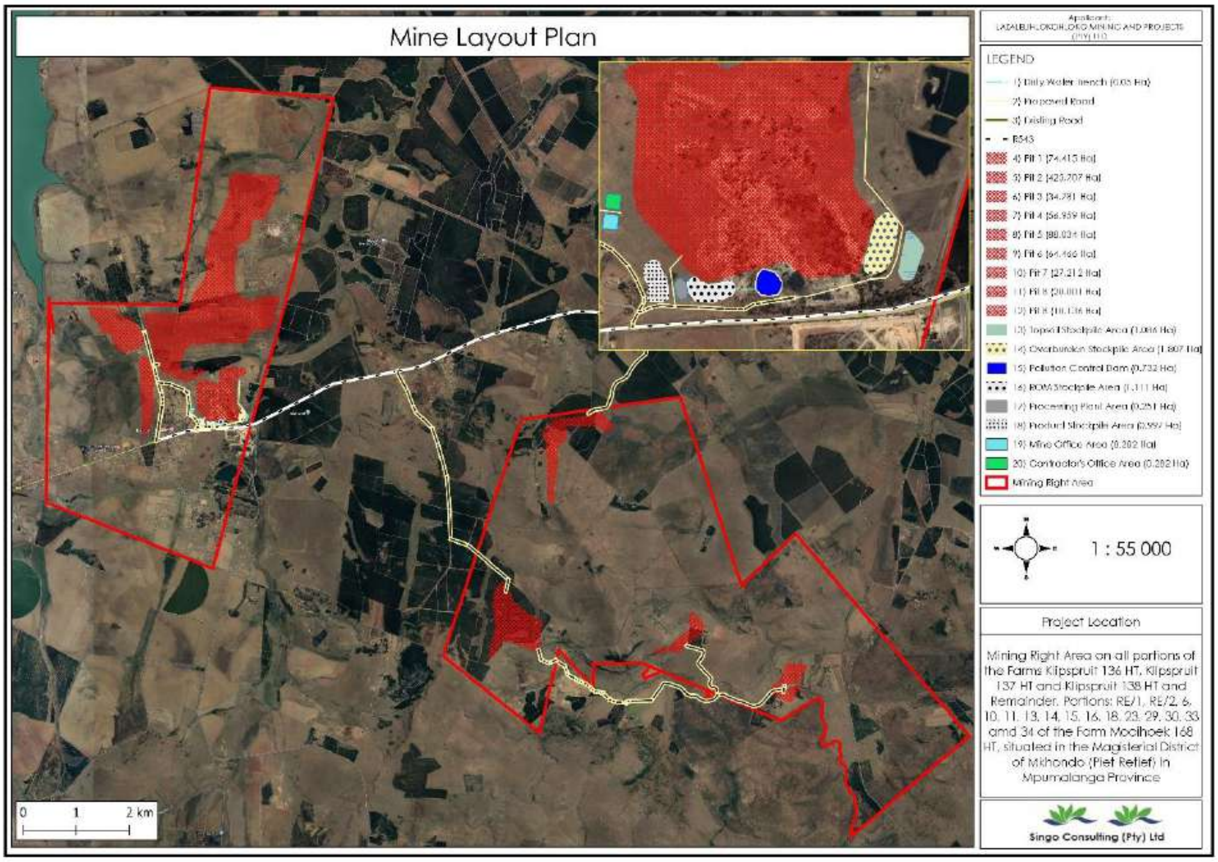


Figure 5: Mine layout plan of the proposed mining right area.[Singo Consulting,2022].

For the proposed mine to operate, the applicant must submit an application for a mining right in terms of Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) with the DMRE. In support of the application, the applicant must conduct a Scoping and Environmental Impact Assessment (S&EIA) process that needs to be submitted to the DMRE for adjudication, which includes activities triggered under the Environmental Impact Assessment Regulations of 2014 (as amended) (EIA) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998) and activities triggered under the National Environmental Management: Waste Act, 2008 (NEM:WA) (Act 59 of 2008).

The proposed open cast coal mining operations constitute various activities that have been listed in the scheduled activities in Government Notice Regulation No 517 (amended 11 June 2021) and therefore require a full S&EIA. Prior to any listed activity being approved by the DMRE, an environmental process must be undertaken, and a report submitted to the relevant environmental authority for consideration. The purpose of the S&EIA process is to ensure that potential environmental, economic and social impacts associated with operation and closure/rehabilitation of a project are identified, assessed and appropriately managed. There are two primary phases, namely the scoping and the impact assessment phase. These two phases are discussed in more detail in the following.

1.1 Scoping phase

The scoping phase is conducted as the precursor to the EIA process, during which:

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

The scoping phase has been completed and the report was submitted to the DMRE on the 27th of May 2019.

1.2 EIA phase process

This proposed mining right's EIA phase has begun and is still ongoing. Consultation with stakeholders and Interested and Affected Parties is continuing, and the EIA report will be disseminated with all identified stakeholders and I&APs for a 30-day review period.

The EIA phase of the application includes:

- Specialist investigations are undertaken in accordance with the terms of reference established in the scoping assessment (plan of study for EIA appended to the scoping report). The scope for specialist work is determined accordingly to the nature and scale of the project impacts.
- An evaluation of development alternatives and identification of a proposed option.
- An assessment of existing impacts (no-go development option), environmental impacts that may be associated with the proposed project option, and cumulative impacts using the impact assessment methodology.
- Identification of mitigation measures to address the environmental impacts and development of actions required to achieve the mitigation required.

- Consultation with I&APs.
- Incorporation of public comment received during scoping and the draft EIA into the report.
- After the draft EIA report is reviewed, comments received will be incorporated into the final full EIA report and final Environmental Management Program (EMPr).

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

1.3 Mining process

Open cast mining will be carried out using the truck and shovel rollover mining technique. As part of the rehabilitation programs, the burden material will be put back into the pit to fill the voids, and soils taken from following strips will be utilized to dress the levelled spoils. Coal extracted from the initial pit will be delivered by truck to the conveyors leading to the washing plant.

The following is a summary of the mining process:

- Mineral: Coal
- Mining method: Opencast
- Depth of mineral below surface: first coalfield was intercepted at 21m and the second seam at 52.58 m.
- Product market: Eskom
- Life of Mine (LoM): 30 years
- Coal transport system: Haul trucks (open cast) and conveyor (to plant area)

2 PROPONENT AND ENVIRONMENTAL ASSESSMENT PRACTITIONER DETAILS

2.1 Details of the proponent

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

Table 8: Proponent's contact details.

Name of applicant	Lazalelihlohloko Mining and Projects (2010 / 009635/ 07)
Tel no	+27 78 146 1436
E-mail	wlmprojects@gmail.com
Fax	+27 86 5144 103
Postal address	4695 Monyanyi Street eMalahleni 1035
Physical address	4695 Monyanyi Street eMalahleni 1035
File reference number (SAMRAD)	MP 30/5/1/2/2/(10230) MR

2.2 Details of EAP

Lazalelihlohloko Mining and Projects has appointed Singo Consulting as an independent Environmental Assessment Practitioner (EAP) to undertake an S&EIA that is required to support the application for a mining right. Singo Consulting has no vested interest in the proposed project and hereby declares its independence as required by the EIA regulations. For purposes of this S&EIA, the following person may be contacted at Singo Consulting:

Table 9: Singo Consulting contact details.

Environmental assessment practitioner	Singo Consulting (Pty) Ltd
Contact person(s)	Abel Mojapelo (Environmental Technician) Rudzani Shonisani (1st Reviewer)

	Dr Kenneth Singo (2nd Reviewer & Principal EAP)
Physical address	Office No: 870, 5 Balalaika Street, Tasbet Park Ext 2, Witbank, 1035
Postal address	Private Bag X7297, Postnet Suite 87, Benfleur, 1035
Contact number(s)	Kenneth Singo: + 27 78 272 7839 / + 27 72 081 6682 Rudzani Shonisani : +27 78 548 1244 Abel Mojapelo : + 27 71 362 7894
Telephone number	013 692 0041
Fax	086 5144 103
Email(s)	Dr Kenneth Singo: kenneth@singoconsulting.co.za Rudzani Shonisani :rudzani@singoconsulting.co.za Abel Mojapelo: abel@singoconsulting.co.za

Environmental Assessment Practitioner expertise

Appendix 2 for CVs of the EAP.

Qualifications and Affiliations

Appendix 2 for EAP's qualifications and affiliations.

1.1.4. Summary of past experience

See **Appendix 2** for EAP CVs.

1.1.5. Specialist studies

Specialist studies were conducted to address the impacts associated with the mining activities. The specialist studies involve the gathering of data relevant to identifying and assessing impacts that may occur as a result of the proposed project. The specialists will recommend appropriate mitigation/control or optimisation measures to minimise potential negative impacts or enhance potential benefits. The mitigation measures and recommendations made by the specialists are included in the EMPr, which will guide the project's construction, operational and decommissioning phases (including rehabilitation). See Section 7 for the environmental attributes associated with the development footprint for a list of specialist studies.

Specialist studies:	
Soil and land capability assessment	Traffic Impact Assessment
Geohydrology study	Heritage Impact Assessment
Rehabilitation Plan	Surface Water Assessment and Floodline determination
Waste Classification	Blasting Impact Assessment Report
Mine Work Programme	Paleontology Study
Hydrology Study	Competent Person Report (CPR)
Geotechnical Studies	

2.3 Property description

The proposed Coal Mine property description is provided in **Table 10** below.

Table 10: Property description of the proposed Coal Mine.

Farm name	Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE, 1, 2, 3, 4) of the farm Klipspruit 136 HT, farm Klipspruit 137 HT and Portion RE/1, RE/2, 6, 10, 11,13, 14, 15, 16, 18, 23, 29, 30, 33 & 34 of the farm Klipspruit 138 HT.	
Proposed name of the mine	Lazalelihlokohloko Mining and Projects	
Application area (ha)	Approximately 6071.950 Ha	
Magisterial district:	Piet Retief	
Local government municipalities	Local municipality: Mkhondo District municipality: Gert Sibande	
Distance and direction from nearest town	The proposed project area is located at approximately 6.20 km South East of KwaNgema, 11.63 km south east of Driefontein, 17.19 km South East of St Helena and 16.19 km South east of Brereton.	
21-digit Surveyor General code for farm portion	T0HT00000000013600001	T0HT00000000016800014
	T0HT00000000013700002	T0HT00000000016800018
	T0HT00000000013700003	T0HT00000000016800023
	T0HT00000000016800006	T0HT00000000016800029
	T0HT00000000016800010	T0HT00000000016800030
	T0HT00000000016800011	T0HT00000000016800033
	T0HT00000000016800016	T0HT00000000016800012
	T0HT00000000013800002	T0HT00000000016800002
	T0HT00000000013600000	T0HT00000000016800013
	T0HT00000000013700001	T0HT00000000016800015

	T0HT00000000013700004	T0HT00000000013800000
	T0HT00000000013800001	T0HT00000000013700000
	T0HT00000000016800000	T0HT00000000016800034
	T0HT00000000016800001	
Locality map	Locality map at a scale not smaller than 1:250000 (see Figure 6)	

2.4 Project location

The mining right is applicable for the Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE,1, 2, 3, 4) of the farm Klipspruit 136 HT , farm Klipspruit 137 HT and Portion RE/1, RE/2, 6, 10, 11, 13, 14, 15, 16, 18, 23, 29, 30, 33 & 34 of the farm Klipspruit 138 HT. This proposed farm area is located within the Mkhondo Local Municipality. The overall extent of the area is approximately 6075.950 ha and is located at 6.20 km South East of KwaNgema, 11.63 km south east of Driefontein, 17.19 km South East of St Helena and 16.19 km South east of Brenton. The site is accessible via the R543. The project area is surrounded by farmlands, settlements, town and coal mines. The area is currently utilised for farming activities, specifically the crop farming activities. This was confirmed on the site assessment that was conducted on the **5th of May 2019**.There are infrastructures like roads and electricity as seen on **Figure 6** below.

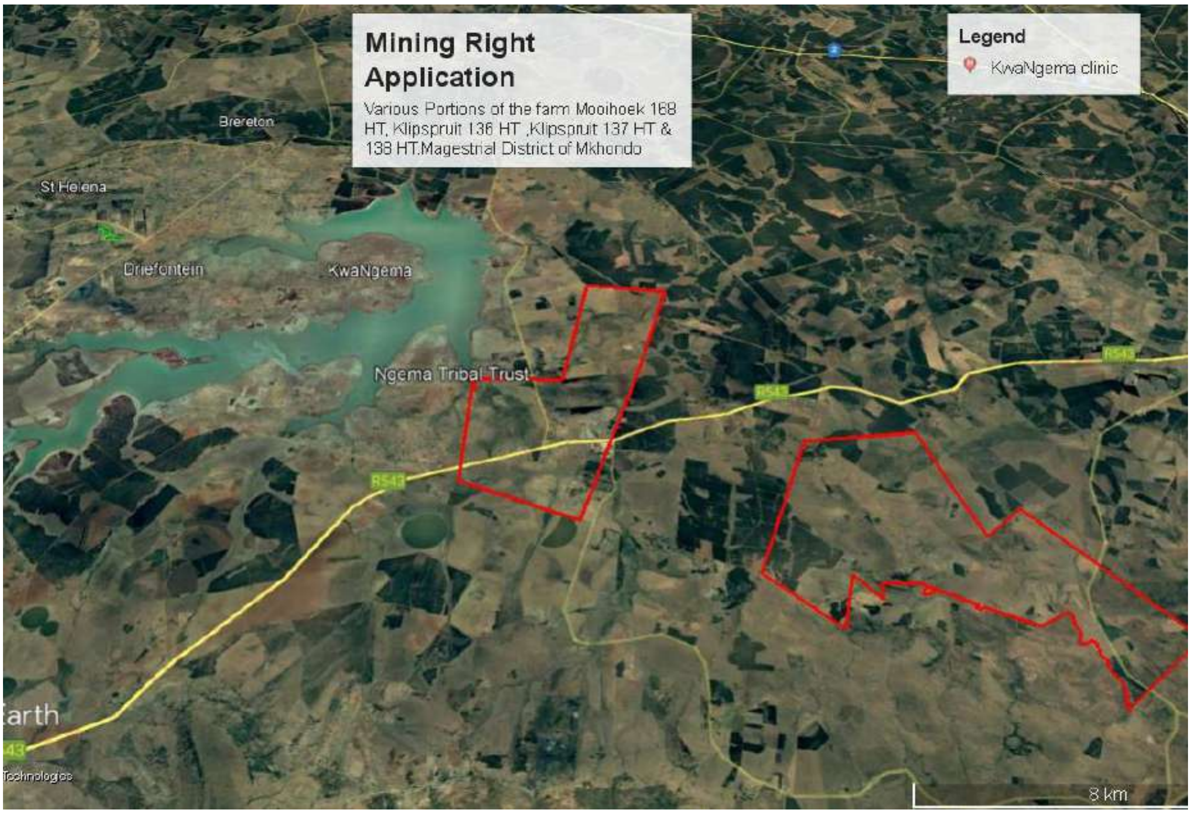


Figure 6: Project area locality map.[Source: Singo Consulting (Pty) Ltd].

3 SCOPE OF THE PROPOSED OVERALL ACTIVITY

3.1 Listed and specified activities

The applicant has applied for a mining right and environmental authorisation for the development of a mine and supporting infrastructure for the farm portion proposed. This application was accepted by the DMRE on the **6th of May 2019** (see Appendix 1). The respective listed activities that require environmental authorisation in terms of the NEMA EIA regulations GN R.326 (amended on 7 April 2017), GN 517 (amended on 11 June 2021) and the waste management activities listed in terms of the NEM:WA GN R. 921 (2013) and GN R.633 (amended 2015) as well as the Integrated Water Use License in terms of section 21 of the National Water Act (36 of 1998) which are indicated in the following tables.

Table 11: Listed activities according to NEMA requiring environmental authorisation.

Government notice	Activity number	Description
Listing Notice 1: GN 517 (11 June 2021)	9	The development of infrastructure exceeding 1,000 m in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 m or more; or (ii) with a peak throughput of 120 l per second or more; excluding where— (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.
	10	The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.
	12	The development of— a) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 m^2; or b) infrastructure or structures with a physical footprint of 100 m^2 or more; where such development occurs –

		• within a watercourse; • in front of a development setback; or • if no development setback exists, within 32 m of a watercourse, measured from the edge of a watercourse
	13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50,000 m^3 or more.
	14	The development and related operation of facilities or infrastructure for the storage/storage and handling of dangerous good, where such storage occurs in containers with a combined capacity of 80 m^3 or more, but not exceeding 500 m^3.
	19	The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 m^3 from a watercourse. Mining activities associated with the physical mining activities, construction of wetland and stream crossing or any other related mining activities that trigger this activity.
	24	The development of a road – a) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or b) with a reserve wider than 13,5 m, or where no reserve exists where the road is wider than 8 m Construction of mining road infrastructure, which will include service, access and haul roads as part of the proposed mining activities.
	25	The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2,000 m^3 but less than 15,000 m^3. Pollution Control Dams.
	28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 1 April 1998 and where such development: a) will occur inside an urban area, where the total land to be developed is bigger than 5 ha; or

		b) will occur outside an urban area, where the total land to be developed is bigger than 1 ha.
	31	The decommissioning of existing facilities, structures or infrastructure for – i. any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014 ii. Any expansion and related operation activity or activities listed in this Notice, Listing Notice 2 or Listing Notice 3 of 2014; iii. Any phased activity or activities for development and related operation activity or expansion or related operation activities listed in this Notice or Listing Notice 3 of 2014; or iv. Any activity regardless the time the activity was commenced with, where such activity: a. Is similarly listed to an activity in i. or ii. above; and b. Is still in operation or development is in progress.
	56	The widening of a road by more than 6 m, or the lengthening of a road by more than 1 km – a) where the existing reserve is wider than 13,5 m; or b) where no reserve exists, where the existing road is wider than 8 m Upgrades to existing roads.
Listing Notice 2: GN.517 (11 June 2021)	4	The development and related operation of facilities or infrastructure, for the storage/storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 m^3. Storage of diesel and other hydrocarbons.
	15	The clearance of an area of 20 ha or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
	17	Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the mining right.

	19	The removal and disposal of a mineral, which requires a permission stated in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the permission. Relates to coal crushing, screening and washing on site.
	24	The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils, but excluding where such extraction or removal is for the rehabilitation of wetlands in accordance with a maintenance management plan.
Listing Notice 3: GN.517 (11 June 2021)	4	*(The development of a road wider than 4 metres with a reserve less than 13,5 metres.)* f) Mpumalanga i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; or (gg) Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas, where such areas comprise indigenous vegetation; or ii. Inside urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.

	10	*(The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.)* f. Mpumalanga i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, where such areas comprise indigenous vegetation; or (hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland; or ii. Inside urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.
	12	*(The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.)* f. Mpumalanga i. Within any critically endangered or endangered ecosystem listed in terms of Section 52 of the NEM:BA or prior to the publication of such a list, within

		an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; or iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.
	14	*(The development of-* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or* *(ii) infrastructure or structures with a physical footprint of 10 square metres or more;* *where such development occurs-* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.)* f. Mpumalanga i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; or

		(hh) Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation; or ii. Inside urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose.

Table 12: Waste management listed activities according to NEM:WA requiring environmental authorisation.

Government notice	Activity	Description
R.921: Category A	7	Treatment of hazardous waste using any form of treatment at a facility with the capacity to process between 10 and 100 tonnes.
	12	Construction of a facility for a waste management activity listed in Category A of this schedule.
R.921: Category B	1	Storage of hazardous waste in lagoons, excluding storage of effluent, wastewater or sewage.
	7	Disposal of any quantity of hazardous waste to land (Discard Dump).
	10	Construction of a facility for a waste management activity listed in Category B of this schedule.
R.633: Category B	11	Establishment/reclamation of a residue stockpile or deposit resulting from activities that require a mining, exploration or production right in terms of the MPRDA.
R.921: Category C	2	Storage of hazardous waste at a facility with the capacity to store more than $80m^3$ of hazardous waste at any time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste

Table 13: Water uses according to NWA requiring environmental authorisation.

Section 21 water use	Description
21 (a)	Abstraction of water
21 (b)	Storage of water
21 (c)	Impeding or diverting the flow of water in a watercourse
21 (g)	Disposing of waste in a manner which may detrimentally impact a water resource.
21 (i)	Altering the bed, banks, course or characteristics of a watercourse
21 (j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people

3.2 Description of the activities to be undertaken

The proposed mining right application involves the area of approximately 6075.950 ha of the Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE,1, 2, 3, 4) of the farm Klipspruit 136 HT , farm Klipspruit 137 HT and Portion RE/1, RE/2, 6, 10, 11, 13, 14,15, 16, 18, 23, 29, 30, 33 & 34 of the farm Klipspruit 138 HT. The mining method proposed to be implemented is the open cast method of mining. This method will be a standard truck and shovel application where the topsoil and the softs are removed and stored at the designated material stockpiles. Drilling and blasting of the hard materials (hards) will then take place. Following the blasting process, material will be dozed into the void following the coaling operation. The remainder of the hard material will be loaded, trucked out of the pit, and dumped over the highwall into the void created by the mining operation. Coaling will then commence, and the process repeated on a strip-by-strip basis. Material (apart from the topsoil) will then be rolled over into the void created by the removal of the coal in the previous bench, with the hard overburden and interburden forming the base. This is followed by the soft overburden, levelled, and finally topsoil will be placed and seeded.

3.3 Mining methodology (as per the MWP)

Mining methods vary widely and depend on the location, type and size of mineral resources. Surface mining methods are most economical in situations where mineral deposits occur close to the surface (e.g., coal, salts and other evaporate deposits or road quarry material) or form part of surface deposits (e.g., alluvial gold and diamonds, and heavy mineral sands). For this specific project, the mining of coal by means of surface mining method is viable due to the fact that the resource is situated close enough to the surface to make it economically mineable. Typical surface mining methods include strip mining and open pit mining, as well as dredge, placer and hydraulic mining in riverbeds, terraces and beaches. These activities always disrupt the surface and, in turn, affects soils, surface water and near-surface ground water, fauna, flora and all alternative types of land-use.

Mine planning for surface coal mines is a repetitive process which can be summarised in a checklist. The cycle begins with geology and marketing and finishes with an economic evaluation. The level of detail (and cost) of the planning increases as the project goes through different stages of approval and development. Feasibility studies cover the work prior to development. The same checklist is used after production commences to develop annual and five-year plans as well as plans for closing down the mine and rehabilitating the area when all the coal has been extracted.

Surface coal mining methodology can be broken into a series of steps. Removing topsoil and either storing it or replacing it on areas being rehabilitated is an important part of the cycle as the objective is to return the land use to at least as good a condition as it was before mining began. Topsoil is an important component as it contains plant nutrients.

Ground preparation may involve using explosives to fragment the large rocks. In some instances, this is done by bulldozers with rippers which use mechanical force to break the rock into smaller pieces. Some mines where the strength of the rock is low require no ground preparation as the excavator can dig directly from the bank.

Waste removal is the process of mining the rock overlying the coal seam and transporting it to the dump. In a strip mine where the dump is in an adjacent strip, it is a sidecast operation. In some mines, however, the dump may be several kilometres away due to the structure of the seam and available dump space and transport to the dump by trucks or conveyors is necessary.

Surface coal mining involves specialized equipment and mining techniques which allow the removal of large volumes of waste and coal from large areas. Rehabilitation is an integral and important part of the process.

The proposed mining method and sequence comprise the following mining activities for waste and coal:

- Initial topsoil and soft overburden removal, which will be stockpiled to ensure it can be placed back in the initial box cut.
- The physical mining of the coal seam, which includes drilling of hard overburden material, charging and blasting.
- Loading coal onto trucks and hauling it to the wash plant followed by the crushing and screening facility.
- Discard coal will be extracted and replaced in the bottom of the open cast, while the product will be taken to the weighbridge via trucks and then moved off-site.
- The overburden is placed back into the box cut as mining progresses, leaving a minimum area open at a single time. Formally known as concurrent rehabilitation.
- The topsoil, which was stripped and stockpiled separately before mining commenced, is then replaced. The findings of the land capability study will determine the optimal composition to ensure pre-mining conditions for utilization.

The proposed mine layout plan will only cover the applied portion. The size and scale of the open-cast mine requires the use of small and conventional truck and shovel mining equipment to mine waste material and coal. To conduct the operational process, the following mining equipment must be utilised:

Production machines

- 9 x excavators (74 tonnes each)
- 8 x Dozer D9 or D10
- 8 x ADTs 40 tons

Support machines

- 4 x Grader 140H/K
- 3 x 18 000 to 23 000 l water bowser/cart
- 6 x 966 front-end loaders
- 5 x 5 000 to 10 000 l diesel bowser
- 2 x LDVs

The aforementioned equipment will be supplied by the mining contractor and the costing thereof will be included in the contractor's unit rates.

3.4 Infrastructure requirements

The project has the following infrastructure requirements:

- Access and haul roads (with necessary security), including upgrading the gravel road access point
- Contractor's yard with septic ablution facilities
- Offices with septic ablution facilities
- Weighbridge, workshop and stores (with septic/chemical ablution facilities)
- Diesel facilities and a hardstand
- Powerlines and water pipelines
- Boxcut
- Stockpiles (topsoil, overburden, subsoil/softs, RoM)
- Surface water management measures (storm water diversion berms and trenches, pollution control dams, tailings dam, etc.)
- Crushing, screening facilities
- Coal wash facility

The proposed mine layout, including infrastructures and Boxcut is shown **Figure 5** below. The layout design adheres to EA requirements for the NEMA and WULA processes.

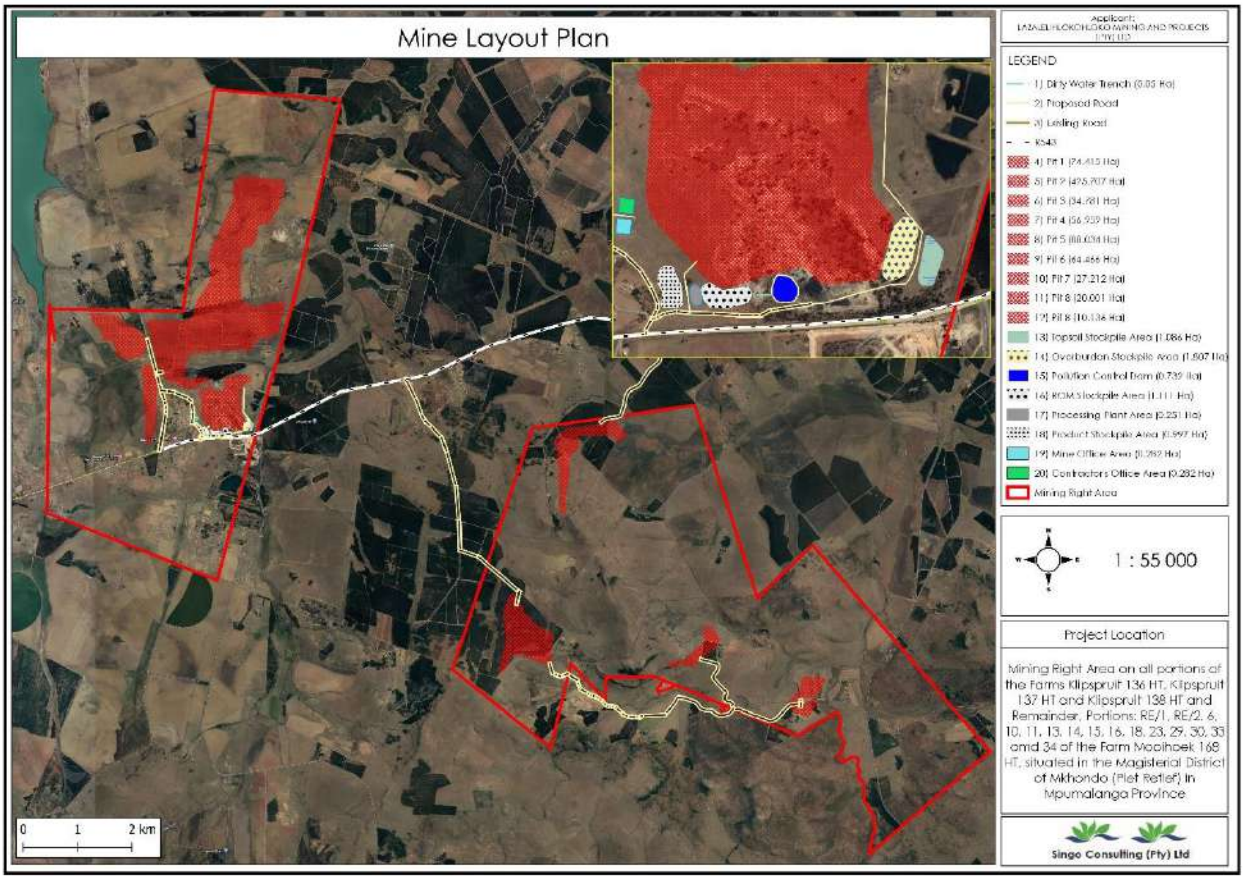


Figure 7: Mining layout for the proposed Lazalelihlohloko Mining and Projects Coal Mine.[Source: Singo Consulting (Pty) Ltd]

3.4.1 Construction phase

The construction phase will commence immediately upon granting of a mining right and will include the following items and expected timeframes:

- Preparation of access roads (3 weeks)
- Construction of contractors yard (1 week)
- Workshop construction (3 weeks)
- Fencing and trenching of mining area (4 weeks)
- Construction of security (boom gates, security house) (4 weeks)
- Installation of weighbridge (3 weeks)
- Construction of ablutions (5 weeks)
- Construction of diesel bunds and installation of tanks (2 weeks)
- Construction of mine haul roads (4 weeks)
- Development of trenches and pollution control facilities (8 weeks)
- Setting up crushing, screening and washing plant (8 weeks)
- Boxcut development (9 weeks)

3.4.2 Access roads

There is an existing gravel road to the proposed mine, linking up with the regional road R543. The access road from the mine to the regional road must be upgraded. This will include excavating the road base to a depth of 0.5 m and backfilling with sandstone to create a permeable base. A 0.30 m ferricrete layer will be placed on the sandstone base to create the road surface. The road will be shaped to ensure adequate drainage.

3.4.3 Contractor's yard

The topsoil and softs over the area will be excavated to a depth of 1.00 m and a sandstone base levelled and to accommodate offices, workshops, diesel storage facilities for the appointed contractor. The topsoil will be stockpiled as per the EMPr.

3.4.4 Workshop

A 10 m x 10 m workshop will be constructed within the contractor's yard. A reinforced concrete platform will be constructed as the base of the workshop.

3.4.5 Fencing and trenching, of the mining area

A fence (5-strand barbed wire) will be established around the perimeter of the mining area. A 2 m deep trench will be dug along the boundaries.

3.4.6 Security and access control

A permanent security house and boom gates will be constructed at the mine entrance. The structures will comprise brick and mortar and will be supplied with electricity from a diesel generator.

3.4.7 Ablutions

Ablution facilities utilising septic tank system will be utilised in the mine offices and security houses. The ablutions will be constructed from brick and mortar and will comply with the requirements of the EMPr.

3.4.8 Haul roads

Permanent haul roads will be constructed from suitable material like laterite and will conform to minimum safety requirements in terms of slopes, widths, etc.

3.4.9 Drainage and pollution control facilities

The principle of keeping clean water out of the mining operation and retaining dirty water will apply to the proposed mine. A series of clean water trenches will be constructed along the boundary and the sub-outcrop line to divert clean water away from mining operations, returning it to the environment.

3.4.10 Transport of equipment to site and establishment of the contractor (crush, screen and wash plant establishment)

A crushing, screening and washing plant with filter presses will be erected at the indicated location. This will ensure the product meets the relevant criteria in terms of sizing and blending.

3.4.11 Weighbridge

An area adjacent to security has been identified for the weighbridge and will require limited cut and fill prior to installation. An accredited weighbridge will be installed by contractors.

3.4.12 Boxcut

Mining operations will commence in boxcuts. The Boxcut will be dug on benches that are between four to sixty meters in size, depending on the exact machinery used to excavate. Overburden from the Boxcut will be loaded and hauled out of the pit and will be utilised for rehabilitation processes.

3.4.13 Operational phase

The operational phase, known as steady-state, will commence after the completion of the boxcut. A conventional strip mining [roll-over] method will be employed. Material from the boxcut phase will be stored per overburden classification, with the bulk of the material placed in position alongside the final strip, to facilitate filling of the final void.

Steady-state mining includes the processes and equipment indicated in **Figure 8** below. The following mining sequence will occur during the operational phase:

- **Topsoil removal:** Topsoil will be removed and stockpiled separately. Topsoil will be removed with excavators and hauled with ADTs.
- **Softs removal:** Soft subsoil will be removed and stockpiled. Softs will be removed with excavators and hauled with ADTs.
- **Overburden drill and blast:** Drilling of the overburden will be done using a mobile drill rig, drilling a hole of a 110 mm in diameter and with a planned burden and spacing of 4 m x 5 m. This may be adjusted once mining has commenced.
- **Overburden dozing:** The first overburden removal process will be to doze overburden material to the spoil side.

- **Overburden load and haul:** The remaining overburden, after dozing, will be loaded, hauled and dumped on the spoil side of the current strip. The load and haul will be conducted with excavators and ADTs.

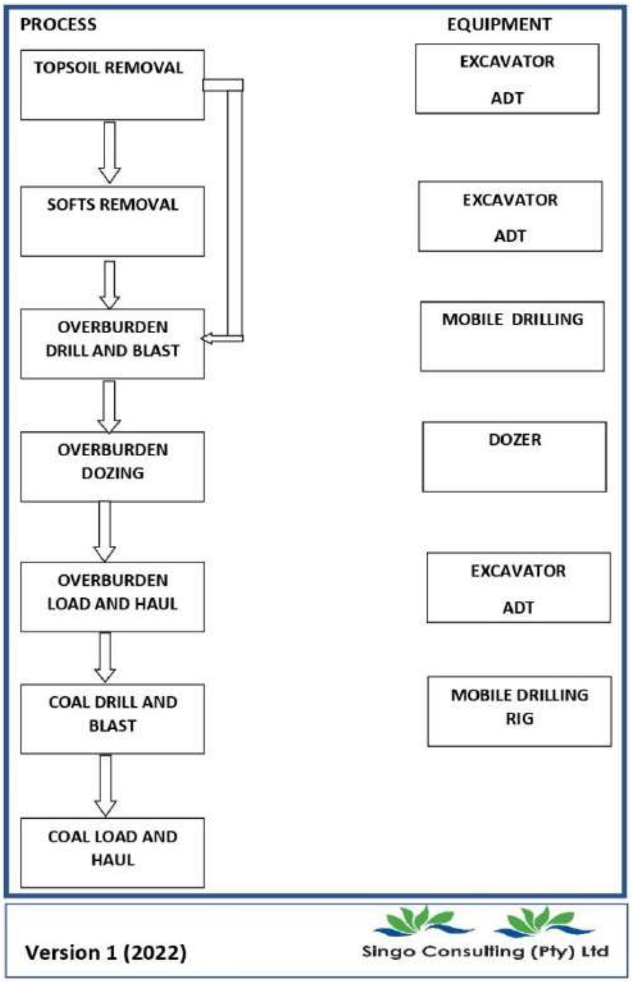


Figure 8: Steady-state mining processes and equipment.[Singo Consulting,2022]

- **Coal drill and blast:** Coal drilling will be done with a mobile drill rig drilling a hole of 110 mm in diameter and with a planned burden and spacing of 7 m x 8 m. This may be adjusted once mining has commenced.
- **Coal load and haul:** The coal will be loaded, hauled and dumped on the RoM stockpile. The load and haul will be conducted with excavators and ADTs.
- **Crush and screen:** A RoM tip feeding the crushing and screening plant; the proposed position of the crushing and screening plant is indicated in Figure 11.
- **Crush, screen and wash:** A RoM tip feeding the crushing and screening plant; the proposed position of the crushing and screening plant is indicated in Figure 11. The blasted coal will be loaded and

hauled to the RoM coal stockpile, from where the coal will be sent to the crushing and screening plant before being hauled via road to the markets.

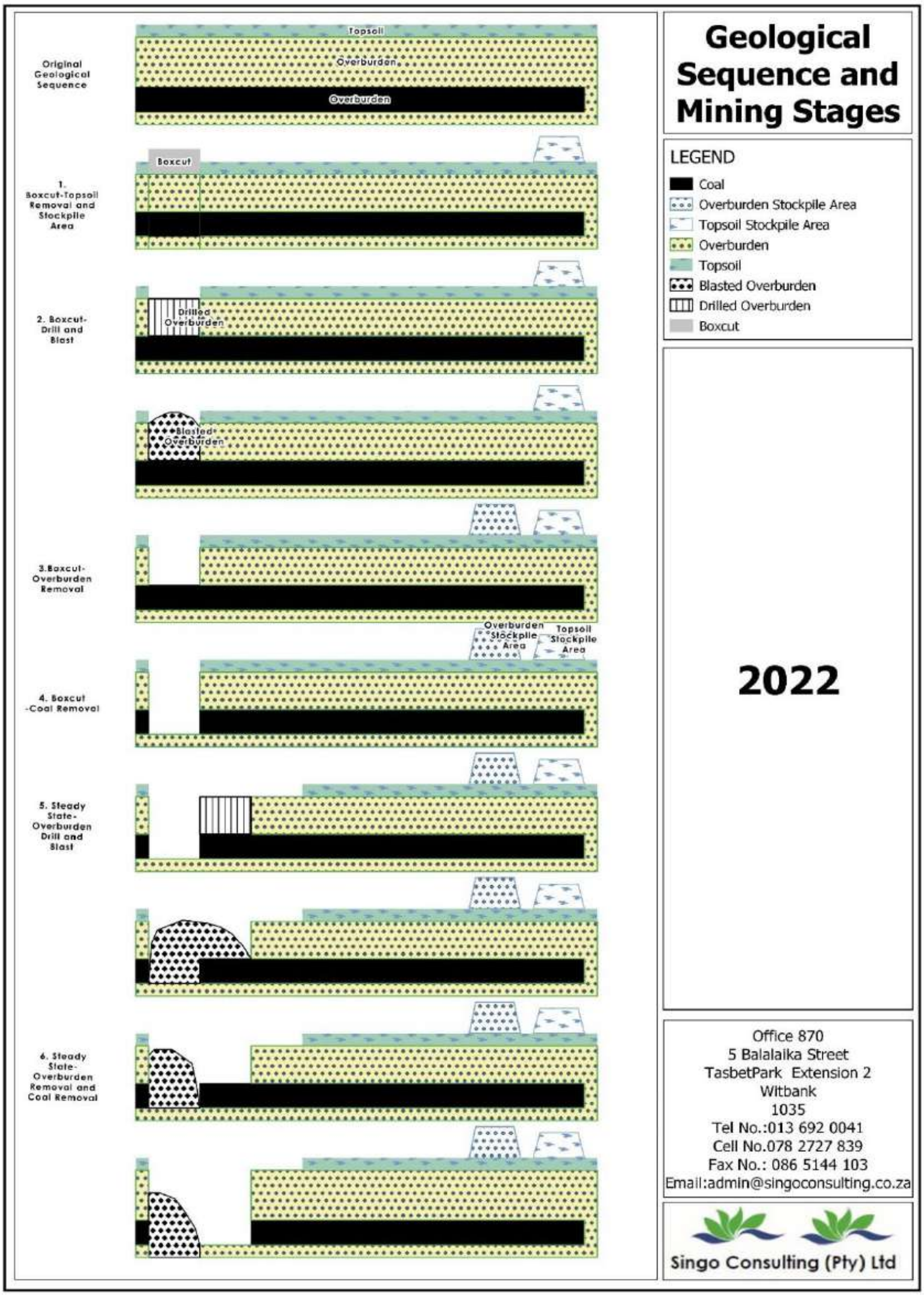


Figure 9: Mining method sequence.[Singo Consulting, 2022].

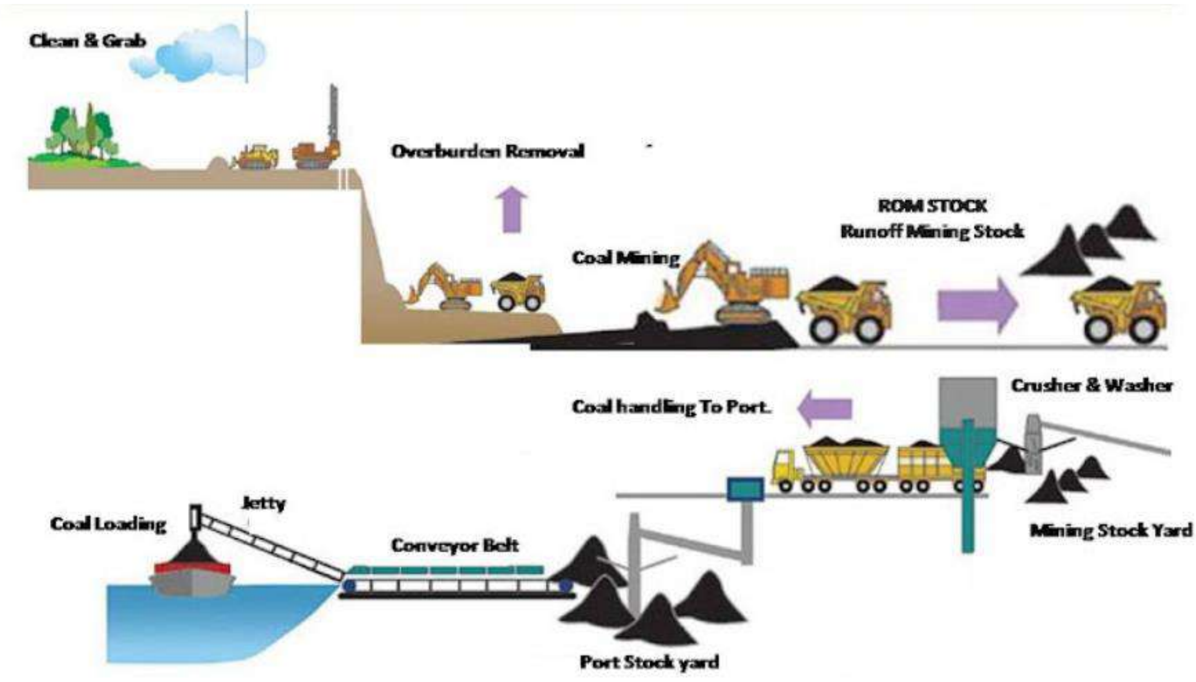


Figure 10: Basic plant design.

Figure 11: Typical example a coal crushing and screening unit.

Table 14: Overview of the governing legislation identified which may relate to the proposed project.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
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.	i.e., Where in this document has it been explained how the development complies with and responds to the legislation and policy context.	E.g., Water Use License has/has not been applied for.
Constitution of the Republic of South Africa, Act 108 of 1996 Section 24 states: "Everyone has the right— (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that— (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".	The EIA is being undertaken to determine the impacts associated with the project, including environmental, social and economic. As part of the EIA process, mitigation measures and monitoring plans are recommended to ensure that any potential impacts are managed to acceptable levels to support the rights enshrined in the Constitution. The project must prove to be sustainable and balance the social, economic and environmental aspects of sustainable development.	An Application for NEMA S&EIR combined with NEMWA S&EIR was submitted to the DMRE on the 17th of February 2019. The application was respectfully accepted on the 6th of May 2022. The scoping report which details the biophysical, economic and social environments that will be affected was compiled and submitted to the competent authority on the 27th of May 2019. This EIA phase is undertaken where the impacts associated with the proposed activities as well as measures to mitigate, manage and monitor the impacts are being determined and included in the EMPr.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Mineral and Petroleum Resources Development Act, 2002 (MPRDA) The Mineral and Petroleum Resources Development Act, 2002 (MPRDA), outlines the procedural requirements an applicant must follow to get a mining right who wishes to proceed with a mining project, part of which requires the applicant to obtain Environmental Authorisation (EA) in terms of the National Environmental Management Act (1998, as amended). The MPRDA is administered by the Department of Mineral Resources and Energy (DMRE) and governs the sustainable utilisation of South Africa's mineral resources. The MPRDA requires that mining companies assess the socio-economic impacts of their activities from start to closure and beyond. Companies must develop and implement a comprehensive Social and Labour Plan (SLP) to promote socio-economic development in their host communities and to prevent or lessen negative social impacts.	A Mining Right Application for the proposed Project was submitted to the DMRE on **17^{th} of October 2021**. This EIA Report, which relates specifically to the Proposed Mining Right applied for, has been compiled in accordance with the MPRDA.	Lazalelihlohloko Mining and Projects has submitted a mining right application, together with the SLP, to mine coal. The EIA is be conducted to meet the requirements of the MPRDA read with the EIA regulations, 2014. Financial provisioning and closure costs will be included in the EIA.
National Environmental Management Act, 1998 (Act 107 of 1998) and EIA Regulations (December 2014 as amended) The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA regulations, the applicant is required to appoint an Environmental Assessment Practitioner (EAP) to undertake the EIA, as well as conduct the public participation process. In South Africa, EIA became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the	This EIA report is informed by the requirements of the NEMA and Regulations there under. An application for Environmental Authorisation was lodged on 17^{th} of February 2021. The listed activities which are triggered under the NEMA have been identified and provided in Table 11.	An EA application for the proposed project was lodged on the **17^{th} of February 2019**. Acceptance of the application was received on the **6^{th} of May 2019.** In terms of the listed activities, an S&EIA is required. Proposed management and mitigation measures for identified impacts responds to the Duty of Care principle, as per Section 28 of the NEMA.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant environmental authorisation. On 21 April 2006 the Minister of Environmental Affairs and Tourism promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended in June 2010 and again in December 2014. The December 2014 NEMA regulations are applicable to this project. Mining Activities officially became governable under the NEMA EIA in December 2014.		A SR was compiled and submitted to the DMRE on 27th of May 2019. An EIA phase (this report) has been undertaken where the impacts associated with the proposed activities as well as measures to mitigate, manage and monitor the impacts have been determined.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) The objectives of NEM:WA involve the protection of health, wellbeing and the environment by providing reasonable measures for the minimization of natural resource consumption, avoiding and minimizing the generation of waste, reducing, recycling and recovering waste, and treating and safely disposal of waste as a last resort. In terms of the NEMWA, all waste management activities must be licensed. On 29 November 2013, the list of waste management activities published under GN R718 of 3 July 2009 (GN R718) was repealed and replaced with a new list of waste management activities under GN R921 of 29 November 2013. Included in the new list are activities listed under Category A, B and C. A distinction is made between: • Category A describes waste management activities requiring a Basic Assessment process to be carried out in accordance with the EIA Regulations supporting an application for a waste management licence; • Category B describes waste management activities requiring an Environmental	The listed activities which are triggered under the NEM:WA have been identified and provided in Table 12. Category B activities were identified; therefore a full EIA process is required the proposed project. The triggered waste management activities have been applied for as part of the Environmental Application to the DMRE. GNR 633 includes the establishment or reclamation of a residue stockpile or residue deposit resulting from prospecting or mining activities as a listed activity.	Various categories of waste management activities are applicable to the proposed mining operation. A WML is included as part of the “one environmental system”.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
• Impact Assessment process to be conducted in accordance with the EIA Regulations supporting a waste management licence application; and • Category C describes waste management activities that do not require a Waste Management License (WML) but these activities will have to comply with the prescribed requirements and standards as prescribed by the Minister, which includes the Norms and Standards for Storage of Waste, 2013.		
National Water Act, 1998 (Act No. 36 of 1998) (NWA) NWA also has a role to play in regulating mining. Mining almost always uses water and/or has an impact on a water resource such as a stream, wetland or river. The NWA is administered by the Department of Water and Sanitation (DWS). The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA. GN 704- Regulations on use of water for mining and related activities aimed at the protection of water resources.	An Integrated Water Use Licence Application (IWULA) and an associated Integrated Water and Waste Management Plan (IWWMP) are required in terms of Section 21 of the NWA for the project and have been submitted to DWS for the applicable Section 21 water uses.	An IWULA has been submitted to the DWS for the triggered water uses under Section 21 of the NWA.
NEM:WA WASTE CLASSIFICATION AND MANAGEMENT REGULATIONS, 2013 (GN R. 634) Chapter 9 of the above-mentioned Regulations stipulates the requirements for a motivation for and consideration of listed Waste Management Activities that do not require a Waste Management License. The motivation must:	A waste classification assessment was been conducted for this project.	Waste streams generated from mine activities will, where applicable, be classified accordingly to determine their nature (i.e. general or hazardous), and subsequently

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
• Demonstrate that the waste management activity can be implemented without unacceptable impacts on, or risk to, the environment or health; • Must provide a description of the waste; • Description of waste minimisation or waste management plans; • Description of potential impacts, etc.: • The transitional provisions under Chapter 6 of this Regulation prescribes timeframes in which all waste must be classified within 18 months from the date of commencement of these regulations (23 August 2013).		managed and disposed of in accordance with the relevant legislative requirements.

National Environmental Management: Air Quality Act
 	
The National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004 as amended) is the main legislative tool for the management of air pollution and related activities. The Object of the Act is:
 	
• To protect the environment by providing reasonable measures for-
    o The protection and enhancement of the quality of air in the republic;
    o The prevention of air pollution and ecological degradation; and
    o Securing ecologically sustainable development while promoting justifiable economic and social development; and
• Generally to give effect to Section 24(b) of the constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and wellbeing of people.
 	
The NEM:AQA mandates the Minister of Environmental Affairs to publish a list of activities which result in atmospheric emissions and consequently cause significant detrimental effects on the environment, human health and social welfare. The Listed
	An Air Quality Assessment (AQA) was not undertaken as part of this EIA phase; however, air quality mitigation measures will be developed to better manage the air quality around the mining area. Measures include but are not limited to dust suppression activities within the mine and the air quality management through dust bucket method.	The Project's activities will set out to abide by the NEM:AQA and standards set out in the NAAQS. The desktop standard required mitigation are included in the EMPr as part of this EIA.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Activities and Minimum National Emission Standards were published on the 22nd November 2013 (Government Gazette No. 37054). According to the Air Quality Act, air quality management control and enforcement is in the hands of local government with District and Metropolitan Municipalities as the licensing authorities. Provincial government is primarily responsible for ambient monitoring and ensuring municipalities fulfil their legal obligations, with national government primarily as policy maker and co-ordinator. Each sphere of government must appoint an Air Quality Officer responsible for co-ordinating matters pertaining to air quality management. Given that air quality management under the old Act was the sole responsibility of national government, local authorities have in the past only been responsible for smoke and vehicle tailpipe emission control. The National Pollution Prevention Plans Regulations which came into effect on 21 July 2017 and tie in with The National Greenhouse Gas Emission Reporting Regulations which took effect on 3 April 2017. In summary, the regulations aim to prescribe the requirements that pollution prevention plans of greenhouse gases declared as priority air pollutants need to comply with, in terms of the NEM:AQA. The regulations specify who needs to comply, and by when, as well as prescribing the content requirements. Mines do have an obligation to report on the GHG emissions under these regulations		
National Environmental Management: Biodiversity Act The overarching aim of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA), within the framework of NEMA, is to provide for:		

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
• The management and conservation of biological diversity within South Africa, and of the components of such biological diversity; • The use of indigenous biological resources in a sustainable manner; and • The fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources. The South African National Biodiversity Institute (SANBI) was established on 1 September 2004 through the signing into force of the NEMBA, its purpose being (inter alia) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems. Other objectives include the identification, control and eradication of declared weeds and alien invaders in South Africa. These are categorised according to one of the following categories, and require control or removal: • Category 1a Listed Invasive Species: Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated; • Category 1b Listed Invasive Species: Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled; • Category 2 Listed Invasive Species: Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be; and • Category 3 Listed Invasive Species: Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which		

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.		
National Environment Management: Protected Areas Act National Environment Management: Protected Areas Act, 2003 (Act No. 57 of 2003) This Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It also seeks to provide for the sustainable utilization of protected areas and to promote participation of local communities in the management of protected areas.		
The National Heritage Resources Act The National Heritage Resources Act (NHRA) (Act 25 of 1999) stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…" The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the NEMWA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental	In accordance with the legislative requirements and EIA rating criteria, the regulations of the SAHRA and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Impact Assessment (HIA) is compiled.	The applicable legislation will be followed in terms of sensitive historical features, such as buildings and graves prior to any construction activities should the mine be approved.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage. The NEMA 23(2)(b) states that an integrated environmental management plan should, "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage". A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down. The MPRDA defines 'environment' as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the National Heritage Resources Act that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities (Fourie, 2008b).		
The Conservation of Agricultural Resources Act (Act No. 43 of 1983)	A soil, land capability, agricultural potential and hydropedology assessment	Rehabilitation of the mining operations will be required post-mining operations. The land

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
To provide for control over the utilization of the natural agricultural resources in South Africa in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.	was conducted during the EIA phase. The study area is located on high agricultural potential land.	needs to be rehabilitated to pre-mining conditions. It is anticipated that the land will be restored to grazing capacity land. The preservation of topsoil is vital to ensure successful rehabilitation measures.
GN R 1147 (Financial Provisioning Regulations), 2015 The Financial Provisioning Regulations prescribe methods for determining the quantum of financial provision for rehabilitation and mechanisms for providing for it. Section 41 (1) of the MPRDA has been repealed and Section 24P of the NEMA, as amended, which provides that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The financial provision must guarantee the availability of sufficient funds.	The financial provisioning regulations are applicable to rehabilitation and closure plans as they prescribe the minimum content of an annual rehabilitation plan and the minimum content of a final rehabilitation, decommissioning and mine closure plan.	Rehabilitation, decommissioning and the mine closure plan, including the financial provision estimate, were assessed during the EIA Phase.
Spatial Planning and Land Use Management (SPLUMA) Act 16 of 2013 The Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) is a framework law, which means that the law provides broad principles for a set of provincial laws that will regulate planning for the country. The Act introduces provisions to cater for development principles; norms and standards; inter-governmental support; Spatial Development Frameworks (SDFs) across national, provincial, regional and municipal areas; Land Use Schemes (LUS); and municipal planning tribunals. SPLUMA also provides clarity on how planning law interacts with other laws and policies. It is a uniform, recognisable and comprehensive system that addresses the	The MRA is currently zoned for agriculture.	The affected property would have to be rezoned from agriculture to mining in order for the mine to continue, should a mining right be approved.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
past spatial and regulatory imbalances, and promotes optimal exploitation of minerals and mineral resources. SPLUMA achieves this by strengthening the position of mining right holders when land needs to be rezoned for mining purposes. SPLUMA's impact on optimal exploitation is particularly evident where conflict exists between mining right holders and landowners. Economic and policy considerations, as well as practical necessities, often motivate the state to grant mining rights to entities other than landowners. SPLUMA is a new national framework Act that provides clear principles and standards for provincial and local governments to formulate their own new spatial planning and land use policies. The new provincial legislation can regulate, among other things, land development, land use management, spatial planning and municipal planning.		
Environment Conservation Act, 1989 (Act 73 of 1989) – Noise Control Regulations In terms of section 25 of the ECA, the national Noise Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) were promulgated. The NCRs were revised under GN R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. The Gauteng Province promulgated provincial regulations: Noise Control Regulations of Gauteng 1999, (Provincial Gazette, Extraordinary no 75 of August 1999). Section 4 of the regulations prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof. A disturbing noise is defined in the regulations as 'a noise level which exceeds the zone sound level or if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more.	The noise control regulations will need to be considered in relation to the potential noise that may be generated mainly during the construction and decommissioning phases of the proposed project. The two key aspects of the noise control regulations relate to disturbing noise and noise nuisance. A noise impact assessment has not been undertaken for this mining right.	The proposed project activities will be set out to abide by the National Noise-Control Regulations and standards set out in the South African National Standards 10103. The noise impacts associated with the proposed activities have been determined through desktop study and mitigation and monitoring measures were proposed to minimise the impacts during the LoM.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Section 5 of the noise control regulations in essence prohibits the creation of a noise nuisance. A noise nuisance is defined as ‘any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person’. Noise nuisance is anticipated from the proposed project particularly to those residents that are situated in close proximity to the project sites. South African National Standard 10103 also applies to the measurement and consideration of environmental noise and should be considered in conjunction with these regulations. There are a few South African Bureau of Standards (SABS) relevant to noise from mines, industry and roads. They are: • South African National Standard (SANS) 10103:2008. ‘The measurement and rating of environmental noise with respect to annoyance and to speech communication’; • SANS 10210:2004. ‘Calculating and predicting road traffic noise’; • SANS 10328:2008. ‘Methods for environmental noise impact assessments’. • SANS 10357:2004. ‘The calculation of sound propagation by the Concave method’; • SANS 10181:2003. ‘The Measurement of Noise Emitted by Road Vehicles when Stationary’; and • SANS 10205:2003. ‘The Measurement of Noise Emitted by Motor Vehicles in Motion’. The relevant standards use the equivalent continuous rating level as a basis for determining what is acceptable. The levels may take single event noise into account, but single event noise by itself does not determine whether noise levels are		

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
acceptable for land use purposes. With regards to SANS 10103:2008, the recommendations are likely to inform decisions by authorities, but non-compliance with the standard will not necessarily render an activity unlawful per section.		

4 NEED AND DESIRABILITY OF PROPOSED ACTIVITIES

The Integrated Environmental Management Guideline Series 9: Guideline on Need and Desirability was promulgated in terms of the EIA regulations, 2010 in Government Notice 891 of 2014. According to these guidelines, the consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the proposed Project along with the broader public interest and societal needs. The guidelines further state that the development must not exceed ecological limits and the proposed actions must be measured against the short-term and long-term public interest to promote justifiable social and economic development, essentially ensuring the simultaneous achievement of the triple bottom line (i.e. social, economic and environmental aspects).

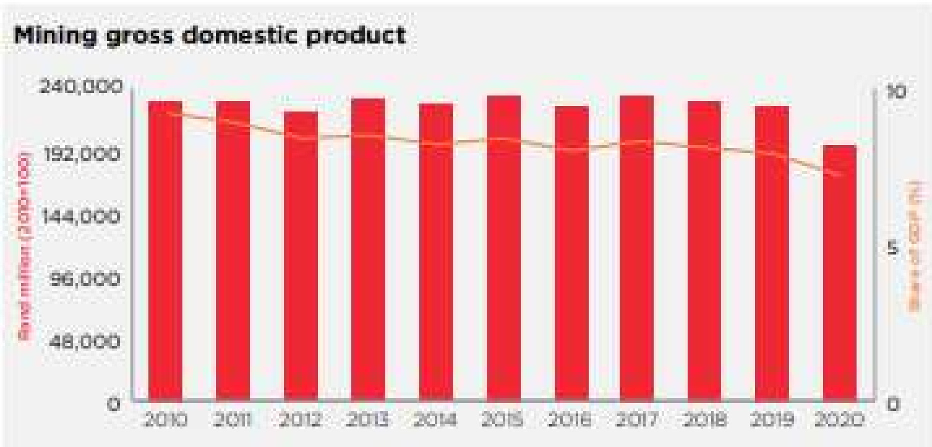
4.1 Economic consideration

This section will examine the need and desirability of the proposed Coal Mine project, the importance of coal as a mineral resource and the desirability of coal mining operations at the proposed study area. According to the Chamber of Mines of South Africa's Integrated Annual Review (2020), mining activities are an essential component of South Africa's economic development.

Figure 12: Contribution summary in 2020.[Integrated Annual Review- Mineral council South Africa, 2021**].**

Mining GDP declined in nominal terms by 0.9% in 2020 to a value of R372.9 billion. After allowing for the more than 24% rise in commodity prices, the inflation adjusted decline is 10.9%%, in line with the Minerals

Council's forecast of a contraction of between 10% and 13% due to the COVID-19 lockdown disruptions in 2020. These trends are in line with our estimates of sales/turnover of R609 billion, which, after adjusting for commodity price escalation is 11.3% lower than during 2019. It is also in line with our estimates of the physical production declines during 2020. It is quite clear that the mercurial rise (between 35% and 40%) in commodity prices between (those that are important to South African exports) have had a major impact on the recovery of mining turnover (+10%) and exports (+24%). It is also clear that physical production is not making a similar recovery (between 10% and 12% lower) and that logistical problems (rail, harbour, road, and people movements) had, and are still having, a negative impact on mining resuming its pre-lockdown levels of activity. Comparing the experience of the global financial crisis with the COVID-19 impact confirms these trends, but also shows marked differences.



Sources: Statistics South Africa, South African Reserve Bank, Minerals Council South Africa

Figure 13: Coal Production and Employment in South Africa[Integrated annual Review- minerals council South Africa,2021**]**

The main differences between the two events seems to be changes in world demand for metals and its impact on commodity price movements. Research by the World Bank shows the differential demand responses to the two crises (annual data); Chinese demand confirms a small, and short-term impact due to the COVID-19 situation compared to the GFC (like the rest of the world). The end result is the impact on the relevant commodity prices.

Marked difference in commodity price movements between the GFC and COVID-19 pandemic

Prices were only 17% higher in January 2020 than nine years earlier, after prices recovered from the GFC. After the start of the GFC it took 40 months for prices to recover, first dropping by 45% (16 months) and then recovering by 76% (over 25 months). Immediately after the COVID-19 shock, on aggregate, Rand commodity prices rose steeply, driven by better Dollar prices and a weakening exchange rate. In three months, prices increased 4.25%, in six months 8.76%, and over a 12-month period 18.6%. According to the Chamber of Mines (2018) coal provides 82% of the power generated within South Africa. South Africa is home to 3.5% of the world's coal reserves and produces 3.3% of the world's annual coal production. South Africa is a net exporter of coal and exports amount to 6% of total global exports. This ranks South Africa as the 6th largest coal-exporting nation in the world. Eskom operates 16 power stations and is building two more that will come on stream by 2021.

The National Development Plan 2030 (NDP) identifies the sufficient production of energy to support industry and providing access to poor households as an enabling milestone toward the reduction of inequality and elimination of income poverty by the year 2030 (National Planning Commission, 2011). It is therefore essential that sufficient coal resources are available to meet the demand required for electricity generation. The coal that would be produced through the proposed Project would be of suitable quality for use in local markets, thereby assisting with the alleviation of the shortage of supply.

In addition to providing an essential resource for power generation in South Africa, the proposed project will have knock-on benefits. These include tax contributions, an overall improvement of the local socio-economic profile job creation and procurement.

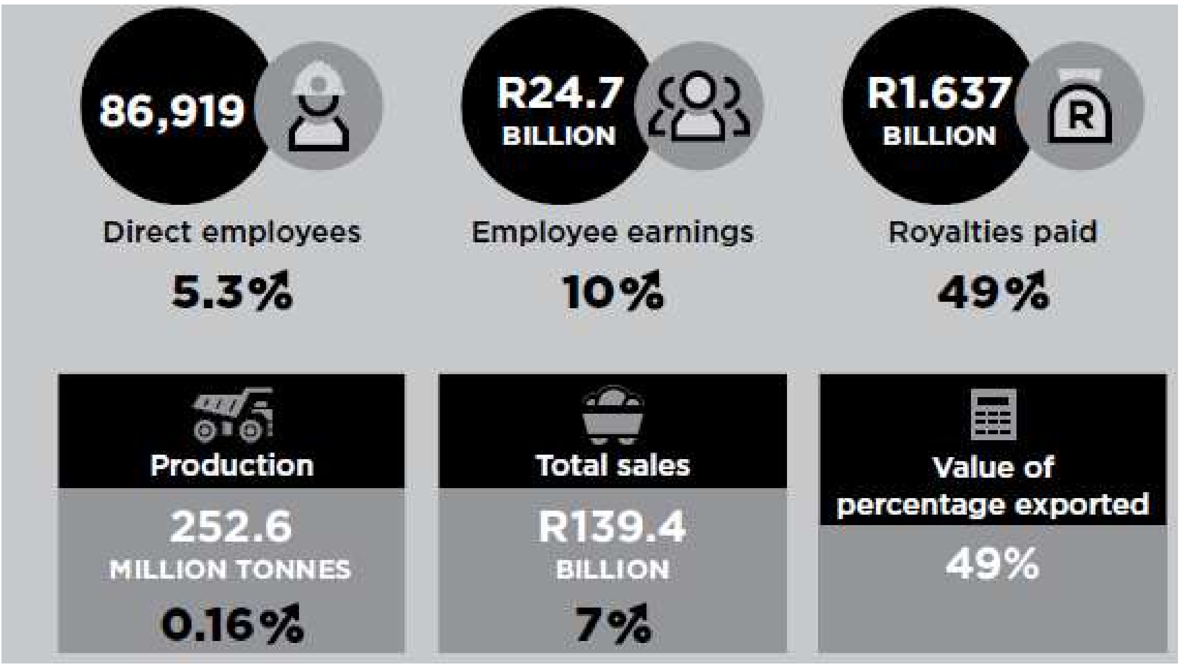


Figure 14: Schematic of Coal production and Employment.[Integrated annual review 2020 -Minerals Council of South Africa**]**

4.2 Social consideration

The proposed project area is located within the Mkhondo Local Municipality. This municipality situated on the Western Highveld of Mpumalanga Province, covering a geographic area of approximately 1,567 square kilometres. The prominent towns and settlements in the Municipality include Piet Retief.

According to the MLM's 2020-21 IDP, Forty eight percent (48%) of the population in the ward is in the age category 18 to 64, representing the generally employable population. This is lower than in the local municipality (59% of the population). There was a larger proportion of females at ward level (52%) than at local municipality level (50%). It is possible that job seekers in the ward, including men, may have moved out of the ward looking for work. The predominant language as one moved from district municipality to local municipality and then ward level was increasingly 106 isiZulu, that is, 60%, 71%, 91% of households respectively. At provincial level, the dominant language was Siswati (27%), followed by isiZulu (24%).

The applicant can assist the municipal area in attaining socio-economic growth in the mining sector, as it anticipates that the proposed project will likely employ 60 employees who represent approximately 90% of the Gert Sibande District and Mkhondo Local Municipality. The surrounding communities of the local municipality will be first in line for employment; this will promote local economic growth. The applicant will also provide skills development to employees, thereby advancing their future employability.

4.3 Coal as an important resource

Coal is one of the five minerals listed by the DMRE for local gain due to its strategic importance and essential role in South Africa's ongoing development (Mineral Resources Department, 2011). The driving force behind the emphasis on the importance of coal, coal mining and local gain is Eskom's concerns about future supply security to its coal-fired electricity generating power stations in the medium and long-term. If Eskom's needs are not met, it could have a negative impact on the economy.

Coal is a hard rock that can be burned as a solid fossil fuel. It is mostly carbon, but also contains hydrogen, sulphur, oxygen and nitrogen. It is a sedimentary rock formed from peat, by the pressure of rocks laid down later on top. Coal has many important uses worldwide. The most significant uses of coal are in electricity generation, steel production, cement manufacturing and as a liquid fuel. Steam/thermal coal is mainly used in power generation.

Eskom utilises coal for electricity generation, based on high ash thermal coal consumption. The energy value required by Eskom is inferior to domestic (A-grade) and export quality production but is customised for use in these power plants. Moreover, the mineable product originates from different geological coal seams which dictate that mining will yield more than one product, marketable to different consumers. Efficiency and profitability for mining companies are optimised by extracting value from multiple seams. This, in turn, contributes to the cost of Eskom-produced coal and the market price remaining fairly low.

Eskom has a dedicated procurement department, including a technical and commercial team. This team ensures that the contracted product quality can be consumed by an assigned power station. Although the range of quality specifications is fairly similar, Eskom makes a distinction between the quality's consumable by different power plants. Usually, the difference is a 2% range in ash and volatile matter and 2 MJ/kg in calorific value.

If rejected material is produced longer than three days, Eskom rejects the total free-on-truck cost of coal for each day. As a result, Eskom has the right to instruct the producer in writing to stop delivery until such time as Eskom is satisfied with coal quality. Eskom has the right to cancel an agreement should any coal quality be in rejection range for any cumulative seven days of a specific calendar month. it is evident that only the moisture sulphur contents for domestic and export quality coal are comparable; all other parameters are entirely different. The potential for substituting domestic and export coal to the Eskom market is very limited without destroying value (Steyn, 2010).

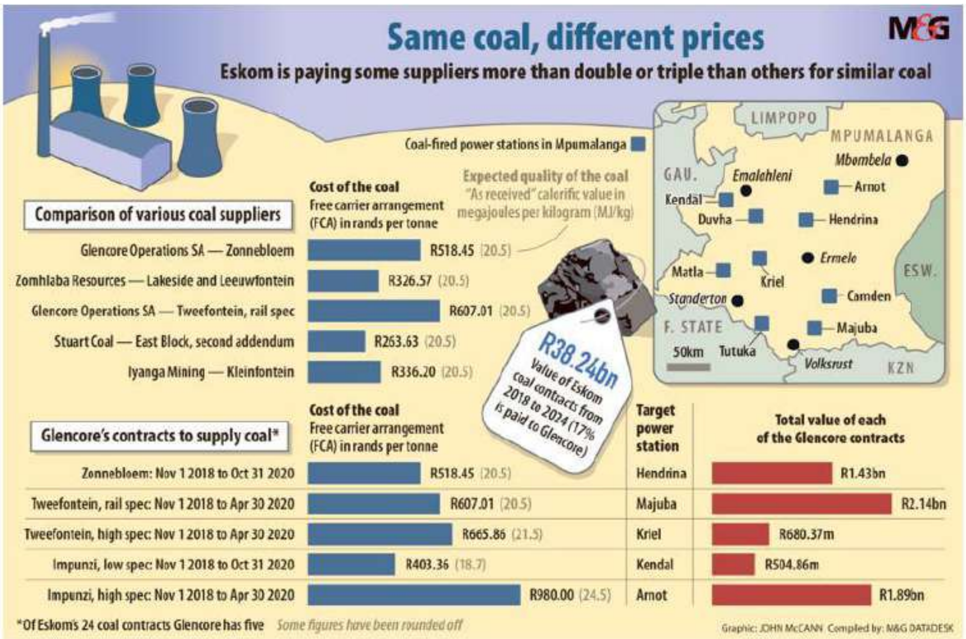


Figure 15: Eskom coal prices in different areas.

The proposed open-cast mining operations will have positive economic impacts on a local, regional and national scale. It will result in additional coal, job creation and skills development opportunities. Two coal mines are operating in the area (Kangra Coal (Pty) Ltd Werk and Jindal Africa Kiepersol colliery) and the proposed mining activities will fit in with these developments. Afer the closer of Kangra mines (Maquasa West Colliery and also the Block C project). Most of the workers were left without jobs and evethough kangra and other ines are in operations on other sectons, not all members of Kwa-Ngema, Drikiesdorp and also Driefontein are employed and with the latest impact that Covid-19 did, it has left a huge jap in terms of employment and also in our economy.

4.4 COAL AS AN IMPORTANT RESOURCE

Coal is one of the five minerals listed by the DMRE for local gain due to its strategic importance as it is considered critical to South Africa's ongoing development (Mineral Resources Department, 2011). The driving force behind the emphasis on the importance of coal, coal mining and local gain is primarily due to concerns raised by the Electricity Supply Commission (Eskom) about future security of supply to its coal-fired electricity generating power stations in the medium and long term of the resource, which will have economic impact if not met.

Coal is a hard rock which can be burned as a solid fossil fuel. It is mostly carbon but also contains hydrogen, sulphur, oxygen and nitrogen. It is a sedimentary rock formed from peat, by the pressure of rocks laid down later on top. Coal has many important uses worldwide. The most significant uses of coal are in electricity generation, steel production, cement manufacturing and as a liquid fuel. Steam coal - also known as thermal coal - is mainly used in power generation.

Coal is mined commercially in over 50 countries and used in more than 70 countries worldwide. Coal is readily available from a wide variety of sources in a well-supplied worldwide market, and it can be transported to demand centres quickly, safely and easily by ship and rail. A large number of suppliers are active in the international coal market, ensuring competitive behavior and efficient functioning.

4.5 Proposed open cast pit mining operations

As according to Kangra data from 2020 in the same area, the coal seam to be mined is limited. The coal seam is close enough for opencast mining to be feasible. The mining will start in the north and move southward. Topsoil will be removed and stacked up for use in future restoration. The overburden will then be loosen and exposed by drilling and blasting. The blasting will take place during the day. At the mine, controlled blasting techniques will be used. Small diameter blast holes are typically used in controlled blasting techniques, either as a pre-shear line in tougher massive rock or as a post-shear (cushion) line in weaker or more severely fractured rock. By using this blasting technique, less fly rock is produced.

The proposed opencast mining operations for the Lazalelihlokohloko Mining and Projects coal mine project, will contribute to favourable economic impacts on both a local, regional and national scale. This will result in numerous job creation and skills development opportunities and injection in the region. If the project was not to proceed the additional economic activity, skills development and available jobs would not be created, and the coal reserves would remain unutilized.

4.6 Period for which environmental authorisation is required

The Mining Right and Waste Management Licence will be required for a period of thirty years, since the lifespan of the mining operation is proposed to be thirty years. This allows for enough time to complete the closure and rehabilitation activities.

5 MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT AT THE SITE, INCLUDING A DESCRIPTION OF THE PROCESS FOLLOWED TO REACH IT

The location of the proposed Coal Mine was selected based on its proximity to the coal seams identified during the prospecting phase. There is a coal mine operation within the MRA , Jindal Mine situated at approximately. 6.10km south of the MRA and approximately 10.69km South East of the proposed MRA. An initial sensitivity analysis was undertaken to determine sensitive features that needed to be considered during the layout design of the project. These sensitivities informed the preliminary mine layout and alternatives were considered where required and possible. Areas of high sensitivity were avoided as far as possible. The location of the pit has included watercourses and the Inkomati - Usuthu Quaternary Catchment W51B & W51C See Figure 16 below.

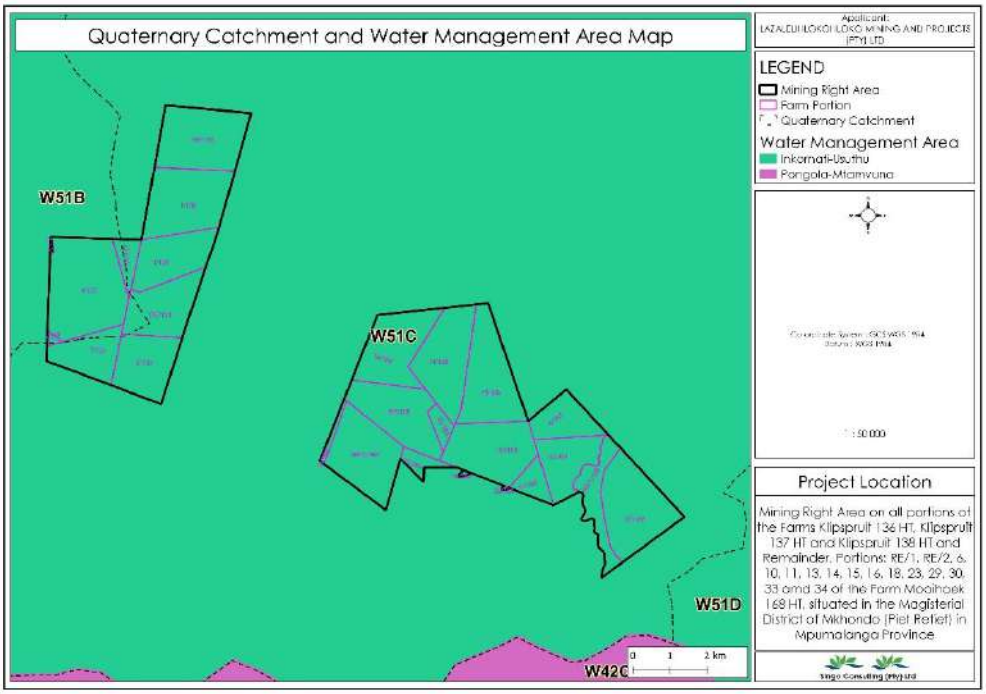


Figure 16: Quaternary catchment and WMA map of the proposed mining right area.[Singo Consulting,2022]

5.1 Details of the development footprint alternatives considered

The identification and investigation of alternatives is a key aspect of the EIA process, which was initially investigated during the scoping phase. All reasonable and feasible alternatives must be identified and assessed during the EIA phase to determine the most suitable or preferred development footprint. There are some significant constraints that have to be taken into account when identifying alternatives for a project of this scope. The preferred option must be highlighted and presented to the authorities.

Alternatives can typically be identified or categorised according to:

- Location alternatives: Alternative project sites in the same geographic area
- Process/design alternatives: Alternative process/design/equipment/technologies

- Associated infrastructure location and layout alternatives: Consideration of the different options to place project infrastructure
- Activity alternatives: Consideration of different means to achieve the same project objective
- No-go alternative: The proposed project/activity does not proceed, implying that the current situation or status quo remains

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

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

5.1.1 Location alternatives of open cast mining blocks

From the CPR conducted in house, the study area was considered due to the positive results obtained during the prospecting phase and exploration drilling with regards to the underlying coal on the farm Klipspruit 136 HT. In February 2012 ,23 boreholes were drilled. Two coal seams namely, Gus & Dundas were intercepted. There is a dolerite dyke which forms the southern boundary of the coal deposit, the dolerite dyke is described as the only major controlling feature in the study area. This dyke is said to have intruded an east-west trending fault, causing an upliftment of the coal deposit to the south and eroding the other seams, leaving only Gus and Dundas intercepted.

In June/July 2007, a similar but separate program was carried out in the farm Mooihoek 168 HT to confirm the information and data collected during the previous program in 2003. Only two seams, the Dundas and Targas, were intercepted, according to the Consulting Geologist that was in-charge of the drilling program. The Absence of the other seams was assumed to be replaced by the dolerite intrusions. The Karoo rocks are said to be heavily intruded by the Karoo Dolerite, which has displaced large areas of the Karoo Sequence and devolatilised the coal seams to form primarily anthracitic coals. On this drilling program (Mooihoek Project), 9 boreholes were drilled, with the Dundas being 1.6 to 2.15m thick and the Targas being 0.75 to 0.9m thick 50 metres below the Dundas seam.

The proposed location and layout for the associated infrastructure of the proposed mine is a preliminary conceptual plan as decided by the applicant and consultation with engineers and making use of available desktop information. The sensitive areas and buffer zones have been overlain with the preferred location and layout for the associated infrastructure. Alternative sites surrounding the mining blocks have been identified, assessed and discussed with the applicant to reduce negative impacts on the environment. See **Figure 17** for the mine layout.

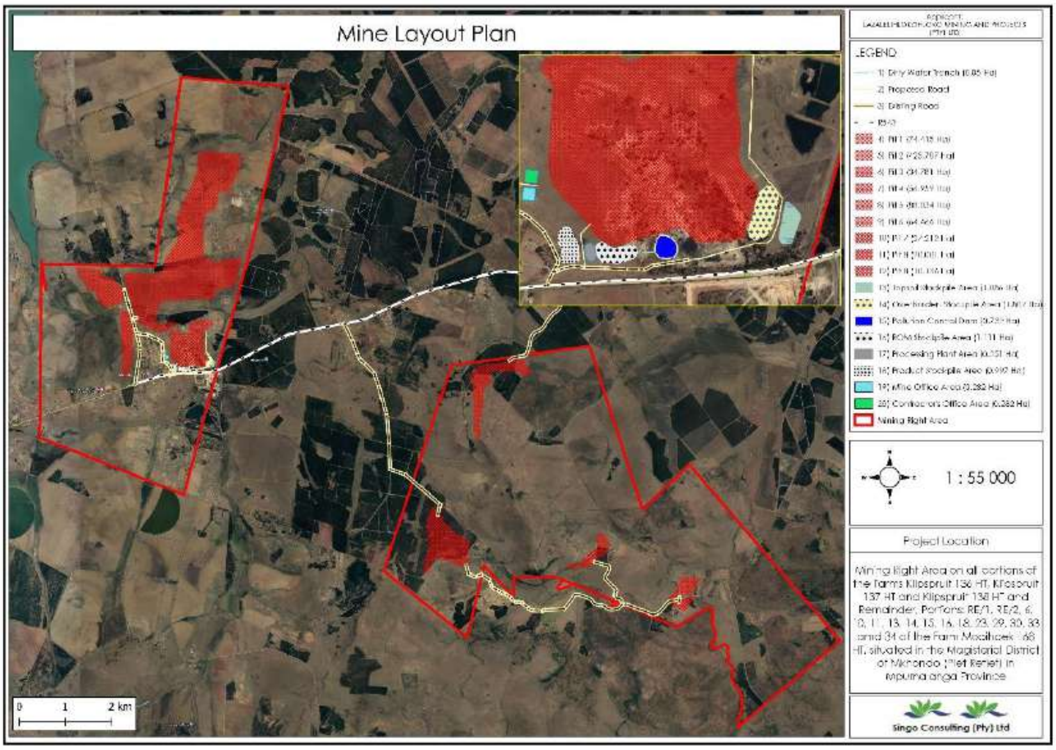


Figure 17: Mining right layout.[Singo Consulting,2022].

Process alternatives

5.1.1.1 Mining method

One alternative option for the main mining process has been identified, namely:

- *Open cast:* This is the current proposed mining process. Previous mining around the area by Kangra coal have been reported. The project area falls within the Utrecht coal field and has two coal seams identified from Borehole information. Drilling was done on spacing of 160mX130m grid to a number of 4 boreholes within mining permit area. Of the 4 seams, only seam 3 and seam 4 fall within minimum height cut off of 0.5m as specified in SANS 103:2004. Algorithmic ordinary Kriging method of estimation was applied in order to estimate coal resources tonnage and quality estimates to report gross tonnes in-situ of measured coal resources within project area is reported to be 88893348 tonnes in accordance with SAMREC code in line with SANS (10320:2004, edition 1).

5.1.1.2 Water supply

Initially it was indicated in the scoping report that two alternatives are considered for the water supply. However, it was considered necessary to source water from several sources and accordingly water will be sourced from borehole for domestic usages. The water that will be used for dust suppression will come from dewatering of the PCD. Excess mine water will be pumped to a Raw Water Dam from where it will be utilized in the mining operations as dust suppression and washing. Potable water will be required for ablution and shower facilities in the change house and office use.

5.1.2 No-go alternative

No-Go alternative: The current land use is mainly cultivated land (maize and grazing). Should the proposed mining development not take place, the land will continuously be used for agricultural purposes, depending on the landowner's needs and desirability for the future. Food security is undoubtedly one of the most important sectors in Mpumalanga, nationally and the world, with agriculture contributing to the GDP. Furthermore, Mpumalanga has more agricultural distribution in the country (see Section 7.7.1.3). The no-go alternative also means that all potential negative impacts associated with the proposed mine and its associated infrastructure would not occur.

Project alternative: Coal has always been a very strategic resource in South Africa, as approximately 80% of the current electricity supply is acquired from coal-burning power stations. Coal has also played a major role as an export commodity to countries that still use coal as the primary resource for electricity generation. Coal is essential in ensuring economic growth in South Africa, until time that renewable energy resources have been established and supply sufficient and fairly cheap electricity to the national grid. This will, however, only be implemented in the next 5-10 years and will only contribute to a portion of the national grid energy supply. The effects of renewable resources contributing significantly more than coal will only be seen after 2030, depending on national policy and implementation with the inclusion of the Covid-19 global pandemic and Moody's downgrading of South Africa. By not implementing this project, approximately 83 permanent jobs will not be created.

Not implementing this project has significant positive impacts from an environmental and social perspective. The impact of greenhouse gases, which contribute to climate change, will be significantly reduced (or cease to exist) should coal not be burned at power stations. The construction and operational phases of the project and the scars left by unsatisfied rehabilitation and poor topsoil restoration efforts (as seen with many coal mines on the Highveld, including Witbank, Piet Retief and Ermelo area), will not impact the local community, receiving environment and surrounding environment. Coal mines have a legacy of depleting and polluting water sources required for human consumption.

The negative and positive impacts are addressed in the impact assessment section where mitigation measures and recommendations are made to decrease negative impacts. Where this is not possible, fatal flaws are identified that needs to be addressed.

6 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

The PPP was developed to ensure compliance with environmental regulatory requirements and to provide I&APs with an opportunity to evaluate the proposed project. During this process, stakeholders can provide inputs and receive feedback from the environmental specialists, other stakeholders and the CA.

6.1 Objectives of public participation

- Provides I&APs with an opportunity to voice their support, concerns and questions regarding the project, application or decision.
- Provides an opportunity for I&APs, EAPs and the CA to obtain clear, accurate and understandable information about the environmental, social and economic impacts of the proposed activity or implications of a decision.
- Provides I&APs with an opportunity to suggest ways of reducing or mitigating negative impacts of an activity and enhancing positive impacts.
- Allows the applicant to incorporate the needs, preferences and values of I&APs in the application.

6.2 Legislation

The PPP must comply with the following = important sets of legislation that require the PPP as part of an application for authorisation or approval:

- The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
- The National Environmental Management Act (Act No. 107 of 1998)
- The National Environmental Management Waste Act (Act No. 59 of 2008)
- The National Water Act (Act No. 36. Of 1998)

Adherence to the requirements of the aforementioned legislation will allow for an Integrated PPP to be conducted, and in so doing, satisfy the requirement for public participation. The details of the integrated PPP are provided in the following.

6.3 Identification of I&APs

During the scoping phase, the following methods were used to develop a stakeholder database which was used to ensure a proper representation of I&APs. This included answering the following questions:

- Are landowners to the proposed study area?
- Are there local municipality/ward councillors with jurisdiction in the area or who represent the ratepayers association?
- Is there an authority or organ of state with jurisdiction in respect of any aspect of the activity?
- Have any I&APs responded to the Background Information Document (BID), advertisements and site posters?
- Have any I&APs attended a public meeting?

An I&AP database was compiled of key stakeholders and I&APs identified for notification of the EAP. The I&AP database includes, amongst others, landowners, communities, regulatory authorities and other special interest groups.

6.4 Notification and register of I&APs

Prior the acceptance letter from the DMRE, the PPP commenced on **26th of April 2019**.The notification procedure undertaken during the scoping phase included the following:

- Site notices plugging within and around the proposed mining right area on the **02nd of May 2019**.
- Newspaper advertisement on the **26th of April 2019** in the Excelsior news, page 08.
- Draft Scoping report sent to all stakeholders as well as Interested and Affected parties through emails, hard copy courier and submission from the **26th of April 2019**.
- Final scoping report submitted to the competent authority on the **27th of May 2019**.

6.5 Background information document

Included in the I&AP notification letters and e-mail is a BID. The BID includes the following information:

- Locality map and description
- Project description and background
- Legal framework
- Explanation of the scoping and EIA process to be followed
- An invitation to get involved and comment on the proposed project
- Time frames of the scoping report

6.6 Notification of availability of scoping report

This draft scoping report was made available for public review for a period of 30 calendar days in accordance with Section 40 (3) of the 2014 EIA regulations. This report was shared to all identified stakeholders through emails and courier as well as submission to the local municipality and the Piet Retief public library as well as soft copies obtainable from Singo Consulting (Pty) Ltd. All incoming comments received from stakeholders and I&APs are therefore included in the Issues and Comments register. Identified stakeholders include; Department of Agriculture, SANRAL (South African National Roads Agency Limited), Department of Water and Sanitation (DWS) together with community members, other departments are anticipated to comment such as the; DRDLR (Department of Rural Development and Land Reform), MTPA (Mpumalanga Tourism & Parks Agency), SANBI (South African National Biodiversity Institute) , Eskom, Anglo American (Thungela), DARDLEA (Mpumalanga Department: Agriculture, Rural Development, Land and Environmental Affairs) ,DFFE (Department of Forestry , Fisheries & the Environmental Affairs), DMRE (Department of Mineral and Resources and Energy) Reports were also hand-delivered to some stakeholders' premises and couriered to others. The SR was made available at the Piet Retief public library (Now known as Mkhondo Public Library) and could be also obtained from Abel Mojapelo (abel@singoconsulting.co.za) from Singo

Consulting and Rudzani Shonisani (rudzani@singoconsulting.co.za). With submission of the application to the DMRE, the formal 300-day EIA process was initiated, as per the NEMA regulations.

All comments received from stakeholders and I&APs are included in the Issues and Comments register. Comments were received from:

- The Department of Agriculture
- South African National Roads Agency Limited (SANRAL)
- The Department of water and sanitation (DWS)
- The Department of Rural Development and Land Reform (DRDLR)
- Mpumalanga Tourism & Parks Agency (MTPA)
- South African National Biodiversity Institute (SANBI)
- Eskom
- Mpumalanga Department: Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)
- Department of Forestry, Fisheries and the Environment (DFFE) - Formerly Known as Department of Environmental Affairs (DEA).
- Town planning (Mkhondo Local Municipality)
- The community

6.7 Consultation with stakeholders during the scoping phase

Scoping report was shared to stakeholders for a 30-day review period. Comments received during this period were attended by project EAP and incorporated in the final scoping report. Results of this consultation are included in the final scoping report which was respectfully submitted to the competent authority for their adjudication.

6.8 Consultation with stakeholders during the EIA phase

During the EIA phase, the following activities will be undertaken:

- Allow I&APs to comment on specialist findings, impacts assessments, EMPr, MWP, etc.
- Verify that comments raised by I&APs have been accurately recorded
- Have a public meeting after releasing the draft EIA report
- Allow all stakeholders to comment on the draft EIA report

An Interested and Affected Parties (I&AP) database was compiled of key stakeholders and I&AP's identified for notification of the Environmental Authorisation Application. The I&AP database includes, amongst others; landowners, communities, regulatory authorities and other specialist interest groups. A list of I&APs is attached in consultation report.

The project area is surrounded by other communities are suggested and an overview of Settlements related to the Proposed Project is denoted below as according to Atha Africa Ventures Pty Ltd report:

- Dirkiesdorp: Dirkiesdorp is defined as a rural node by the Mkhondo Municipality IDP (2011). It is a sprawling formal rural centre, which converges along the R543, half way between the towns of Wakkerstroom and Piet Retief. WSP was informed that the town of Dirkiesdorp was established in the 1980s, when a local farmer opened a drug and alcohol abuse rehabilitation centre for Black African people living in the vicinity of his farm (pers. comm. Themba Trust, March 2012). In 1985, the Themba Trust (a non-profit organisation opened in 1983 by a Lutheran missionary) opened an agricultural high school for boys, and in 1996 bought a piece of land nearby to start a separate boarding school for girls (pers. comm. Themba Trust, March 2012). The schools have subsequently consolidated to form a mixed-gender school, which is rented by, and teachers are paid for by, the Department of Education.

  The Trust has also set up a number of other social and educational facilities within Dirkiesdorp, including a crèche, and training and skills development centres. The Themba Trust also owns a number of plots of land and buildings in 19 the town, which are rented out to local entrepreneurs for a tuck shop, bakery, second hand shop, computer classes and by the Department of Health as a clinic. The residents near the centre of Dirkiesdorp have access to basic municipal and community services including water points within some houses or within properties, pre-paid electricity, and some water-borne sewerage. Social facilities include a police station, clinic, social centre for the elderly, and a secondary and high school. Further out from the centre of the town, houses access boreholes and rivers for water, make use of pit latrines, for sanitation and wood for heating and cooking.

  The town is considered safe by local residents (pers. comm. Dirkiesdorp resident, March 2012), with relatively little crime compared to more urban areas. The extended Dirkiesdorp area is comprised predominantly of large family (traditional Zulu) homesteads, with some individual houses. The dwellings are constructed from a variety of materials, ranging from permanent brick structures to “wattle and daub” traditional mud structures. The employment levels are very low in Dirkiesdorp (pers. comm. Themba Trust, March 2012). HIV and AIDS,and related health impacts, are key health concerns in the community. According to the Themba Trust, the HIV infection rates are high. This is likely to be due to the low levels of education and employment in the community. Another social issue highlighted during the study was alcoholism, which was stated as a concern by one of the community members interviewed (pers. comm. Dirkiesdorp resident, March 2012). Once again, the low level of employment could be a direct cause of this issue. Income is likely to come from working on nearby farms and towns, but mainly through social grants and a limited percentage through entrepreneurial enterprises, such as a road-side tuck shop, hair salon, and taverns (pers. comm., Dirkiesdorp resident, March 2012).

- KwaNgema: The KwaNgema settlement is located midway between Piet Retief and Dirkiesdorp. This is a large, sprawling community, without a key central point . It is comprised predominantly of scattered traditional homesteads. KwaNgema, however, appears to be more established, with larger, cohesive homesteads, which include visible small-holdings for subsistence crop farming. This community appears to have a stronger focus on agriculture activities, specifically crop and cattle rearing. Little evidence of social services or municipal services was observed within the settlement. There is limited electricity and water supply services (Mkhondo IDP, 2012). According to the Mkhondo Local Municipality IDP (2011), there are severe service backlogs in this area (especially with regards to the provision of electricity). Comments within the IDP by communities indicate that housing is insufficient, with a number of people living in shacks and mud huts. Water is trucked in by the municipality, however is limited and does not reach all areas of the settlement. The roads in this area are also poor, being comprised of gravel, which is not graded regularly, resulting in the roads often being impassable. The IDP (2011) also highlights the need for crèches, schools, community halls, healthcare houses and many other social and basic services to be provided to the KwaNgema area. Currently, developments are still not picking up rapidly as supposed to be, thus far there’s only one health care facility in existence called Kwa-Ngema clinic).

6.9 NOTIFICATION AND REGISTER OF I&APS

The notification procedure included the following:

- Newspaper advertisement: Published in ‘Excelsior Nuus/News on **26th of March 2019** for Scoping report availability and consultation as seen on **figure 16.**
- Site notices were plugged on the same day as the community meeting - **02nd of May 2019** at Municipal Town Hall (Piet Retief).
- Draft Scoping Report was shared among stakeholders for review and commenting from the **03rd of April 2019th – 03rd of June 2019**.
- A Landowner meeting with Kangra Coal was held on the **23rd of May 2019** at Kangra mine (Driefontein).

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Excelsior

Deadline for all news articles should be in no later than Tuesday at 12:00

Tel.: 017 826 2176/2191
Fax: 017 826 2177
excelsior@lantic.net
19 Kruger Street
Piet Retief

"Wings for life" run for those who can't!

Wings for Life world run

Monique Potgieter

Come sunshine or rain on Sunday, 5 May 2019, at 11:00 UTC (Coordinated Universal Time) and 13:00 South African time, thousands of people will partake in this global charity run hosted by "Wings for life" all over the world.

With a moving finish line, a "catcher car" chases runners along a course designed by the organisers that are hosting at different locations all over the world. After about half an hour or a few kilometres the car should start passing runners, going faster until each runner is caught. Runners can celebrate their own personal achievement of kilometres ran when they are caught. The last man or woman caught will be declared global champion. 92.14 km is the current record for the "Wings for life" world run. If you are not able to make it to one of the event locations you can download the Wings for Life World Run App and be chased by a Virtual Catcher Car at the same time as the rest of the people around the world. All entry fees and donations go directly to life-changing spinal cord research projects and clinical trials. For more information please visit the "Wings for life" website. www.wingsforlifeworldrun.com

A team from Piet Retief High School will also join in the fun at the event hosted in Centurion. They will participate in the race on behalf of the "Hope for Henno Organisation." Anyone is welcome to join their team or make a donation. For more information please contact Marijke de Waal on 084 469 8158.

NOTICE OF COAL MINING RIGHT APPLICATION, ENVIRONMENTAL AUTHORISATION, INVITATION TO PUBLIC MEETING AND AVAILABILITY OF THE SCOPING REPORT ON PORTIONS OF THE FARMS; MOOIHOEK 168 HT PORTIONS (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) KLIPSPRUIT 136 HT PORTIONS (RE, 1, 2, 3, 4) KLIPSPRUIT 138 HT PORTIONS (RE, 1, 2, 3, 4) LOCATED AT PIET RETIEF MAGISTERIAL DISTRICT, MPUMALANGA PROVINCE

This notice serves to inform all interested and affected parties that in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002); National Environmental Management Act (Act No. 107 of 1998) as amended (in April 2017) and the National Water Act of 1998, that **Lazalehlhlokohloko Mining and Projects (Pty) Ltd** intends to carry out environmental authorisation process (Scoping & Environmental Impact Assessment Reporting (S&EIR)) and an Integrated Water Use Licence Application (IWUL) for coal mining right with

DMR Ref.: MP 30/5/1/2//3/2/1(10230)MR.

Description: Lazalehlhlokohloko Mining and Projects (Pty) Ltd holds a **prospecting right MP 30/5/1/1/2/5058 PR** and intends to establish a coal mine through both open pit and inderground mining methods with associated infrastructures.

Project Location: The proposed mining right area is located approximately 24 km south-western side of Piet Retief, Magisterial District: Piet Retief under Mkhondo Local Municipality, Mpumalanga Province.

Size of the site: The application is on; Mooihoek 168 HT Portions (RE, 1,2, 3,6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33), Klipspruit 136 HT Portions (RE, 1, 2, 3, 4), Klipspruit 138 HT Portions (RE, 1, 2, 3, 4) and its approximately **7675.58640 ha.**

Notice of Scoping report: This serves to notify I&AP's of the mining right, environmental authorisation application and availability of the Scoping Report for public review for a minimum of 40 days from the **23rd of April 2019 to the 3rd of June 2019.** Report will be available at: **Piet Retief Public Library: Address B10 Retief Street (Longitude, 27.10; Latitude, -26.71).**

Telephone number: 017 826 8100 and fax number: 017 826 3129, can also be sent via e-mail upon request and via dropbox link from the EAP.

Notice and invitation to a Public Meeting: A **public meeting** will be held on **Thursday, the 2nd of May 2019 from 10:00 - 12:00 at Cifi Hall, Kingdom Hall, Jehovah's Witnesses, 9 Botha Street at Piet Retief.** All interested and affected parties are welcome to attend the meeting.

A Water Use Licence Application (WULA) under the provisions of the National Water Act No. 36 of 1998 (NWA) is required for the mining operations. WULA will be applied for and submitted to the Department of Water and Sanitation as a request for Section 21 of the NWA. There are pans and wetlands around the Mining Right area, which must be authorised. It is anticipated that Lazalehlhlokohloko Mining and Projects (Pty) Ltd will require water for mining operations and potable use. There are associated tributaries and wetlands near the proposed mining right area. The development of the mine would therefore be 500 m away from the wetland. An integrated WULA application will be followed for the following water uses:

- 21(a) Abstraction from a borehole
- 21(c) and (i) Activities within 500 m of a wetland
- 21(g) Dust suppression
- 21(g) Coal stockpiling
- 21(g) Mine Residue Disposal
- 21(g) Dirty Water dam(s)

Other required Section 21 water uses will be detailed in the Scoping Report for public review.

For further information and more details of this article, please contact the following representatives as mentioned below:

Consultant Contact Person	Applicant Contact Person:
Singo Consulting (pty) Ltd Office No. 14, First Floor (South Block) Corridor Hill Crossing 9 Langa Crescent Corridor Hill, eMalahleni Lead EAP: Siyabonga Mashigo Cell: 065 875 8194 Fax: +27 86 5144 103 E-mail: siyabonga@singoconsulting.co.za Assistant EAP: Rudzani Shonisani Cell: 078 548 1244/079 930 4772 Fax: +27 86 5144 103 E-mail: rudzani@singoconsulting.co.za	Private Bag X 7294 Suite No. 13 Dieheuwel eMalahleni Contact Person: Mtongeloa William Sindane Cell: 072 896 3622 Fax: 086 505 2695 E-mail: wlmprojects@gmail.com

Plaaslike talent geniet Ghoemas

Kate-Merie Ferreira

Op Woensdag, 17 April is die Ghoemas by die Sun Arena, Time Square Menlyn Main aangebied en hierdie spoggerige geleentheid is nie net deur bekroonde akteurs, aktrises en sangers bygewoon nie, maar ook deur Piet Retief se eie Michael Blignaut!

Michael is deur sy produksiemaatskappy, Starburst Promotions, genooi om as hul gas saam na die Ghoemas toe te gaan. Om 17:00 moes gaste by die Maslow Hotel, Time Square wees om te registreer as deel van die groep wat die aand se verrigtinge sou bywoon. 'n Ligte ete en drankies is bedien voor die toekennings om agtuur verfilm is.

"Toe ek al die bekendes om my begin raaksien, toe weet ek, ek is nou by die Ghoemas en wat 'n ongelooflike geleentheid was dit nie om met die ervare ouens in die bedryf te kon gesels nie," het Michael gesê. Om 19:30 moes almal hulle sitplekke inneem en om 20:00 het verfilming begin. Die hele Starburstgroep het saam gesit en so kon hulle al die bekende kunstenaars wat by die maatskappy geteken is, ontmoet.

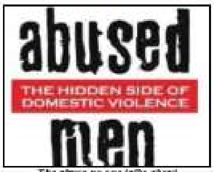
Die aanbieder vir die aand was Willem Botha, by het al die benoemdes in hulle verskeie kategorieë genoem, die wenners is aangekondig en elkeen het met trots sy Ghoema op die verhoog gaan ontvang. Demi Lee Moore het met vyf Ghoema-toekennings weggestap en Taryn Lamb met vier.

Na die Ghoema-vertoning is almal genooi vir 'n "Makietie" by die Altitude Champagne Bar, in die Maslow Hotel en daar is saam met van die grootste name in die musiek- en TV-bedryf gekuier.

"Dit was beslis 'n aand wat ek nooit sal vergeet nie en hopelik in die nabye toekoms sal 'n Ghoema-beeldjie vir my ook beskore wees."
- Michael Blignaut

Ons hoop saam met jou so Michael! Geluk aan al die wenners.

Violence and domestic abuse against men



The abuse no one talks about

Kate-Merie Ferreira

Stereotypes concerning violence and domestic abuse are almost exclusively geared towards women being the victims, when in fact, men are facing the same problems.

They are just not willing to come forward out of fear of being perceived as weak or less of a man.

Women are often seen as the weaker, gentler sex and men are seen as being stronger and more prone to violence, the expectation is that men are not allowed to cry or show emotion. Men regularly suffer under physical abuse like biting, spitting, kicking, hitting and being pushed around. Although the physical bealings can be brutal, emotional abuse is more of a struggle for the 'stronger sex'.

Signs of emotional abuse include controlling and manipulative behaviour from female abusers. This entails withholding affection, threatening to kill themselves or others, threatening to take custody of the children, stalking, making the man feel like it's his fault or minimizing the abuse.

This behaviour from women is often excused with things like, "she was abused when she was younger", "she experienced severe emotional trauma" or "it's just the hormones". None of these are valid reasons for spousal abuse and behaviour like this should not be taken lightly.

Men are far less likely to come forward and talk about the abuse and this feeds the problem, they often feel that the police can't help them or that they will not believe them.

If you find yourself in a situation like this, you are not less of a man for reporting it, there are people going through the same thing and staying in this harmful situation is not good for anyone. It is important to not retaliate when abuse is taking place, keep evidence of the abuse and report the issue immediately. You are not weak for coming forward and you are not alone!

For more information on abuse or for help when going through this situation, feel free to visit these websites or call one of the following numbers.

- National counselling line: 0861-322-322 - Counsellors help callers with challenges such as trauma, suicide, and relationship issues.
- Website: www.lifeline.co.za
- Stop Gender Violence helpline: 0800-150-150 - National toll-free helpline for survivors, witnesses and perpetrators of gender-based violence.
- Family and Marriage Association of SA:
- National office: (011) 975-7106/7
- E-mail: national@famsa.org.za
- Website: www.famsa.org.za

Figure 18: Proof of newspaper publication shown in red .

Figure 19: Community Meeting.[Singo Consulting,2019**].**

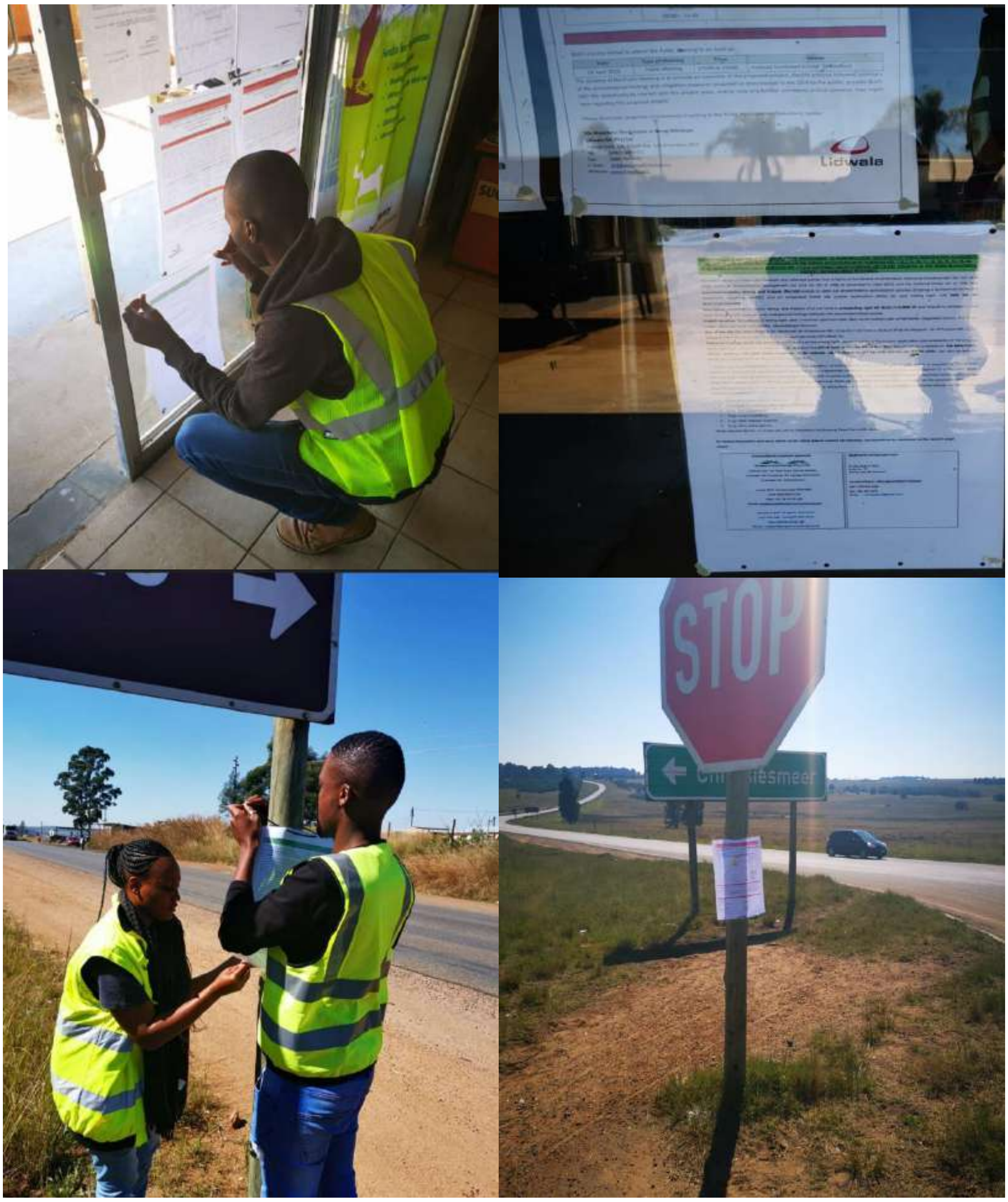


Figure 20: Plugging of site notices.[Singo Consulting,2019]

Appeal received

No appeal has been lodged thus far for the proposed mine area.

This draft EIA report will be submitted for public review for a period of 30 days. All comments received will be incorporated into the final EIA report that will be submitted to the DMRE.

This draft EIA will be made available for review at the location listed below and is also available on request through the environmental Technician from Singo Consulting (Pty) Ltd: abel@singoconsulting.co.za & admin@singconsulting.co.za. Electronic copies (Via WeTransfer, Dropbox, Email, etc.) will be available from Singo Consulting (Pty) Ltd on request. Hard copies will be submitted to the MLM as well as the Piet Retief public library for all public to review.

Areas	Contact Person	Addresses
Public library Piet Retief	N/A	Piet Retief, 2380
Driefontein Police Station	Constable Simuzwane (072 5064 324)/ (076 9546 203)	141/129 Driefontein Road, Daggakraal, 2431
Dirkiesdorp Police Station	Serg L.D Luyele (072 5064 324)	1 Main Street Dirkiesdorp Piet Retief 2386
KwaNgema Clinic	Simphiwe Mavuso (017 8266 946)	Unnamed Road, Ngema Tribal Trust
Mkhondo Local Municipality	Vusi Dube (087 630 0180/082 065 4597)	33 Mark & De Wet Streets, eMkhondo

6.10 Summary of issues raised by I&APs

Comments and concerns raised following the final SR will be recorded. There will be a public review period for the draft EIA comments received during this period will be captured and responded to in an updated report which will be included in the Final EIA report.

Names of I&APs	Organisation/Capacity	Position
Ramavhona T	Dept of Environmental Affairs	Official
Mkhabela A	Dept of Economic Development & Tourism	Official
Mazibuko T	Mkhondo Local Municipality	Official
Nevondo Seani	Dept of Water & Sanitation	Official
Khumbelo Makhuvha	Mpumalanga Tourism	Official
Mary M	Dept of Agriculture, Forestry & Fisheries	Official
Isaac Ledwaba	Dept of Labour	Official
Jan Olivier	SANRAL	Statutory Controller
Herry Ludere	Eskom	Officer Land & Rights Negotiations
Lazarus Masuku	Dept of rural development and land reform	Official
Niketiwe Dlamini	Kangra Coal	Environmental Consultant (Landowners)
Conrad Hiestermann	Mooihoek 168 HT	Landowner

Remo Beneke	Reheivo Boedery	Landowner
Nevi tunhuma	Jindal Africa	Landowner
Bradley Gibbons	African Crane Conservation Programme, Endangered Wildlife Trust	Highland Grassland Field Officer (I&AP)

Table 15: Summary of issues raised by I&APs.

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an **X** where those who mustbe consulted were in fact consulted.		Date Comments Received	Issues raised	EAPs response to issues as mandated bythe applicant	Section and paragraph reference in thisreport where the issues and orresponse were incorporated.
AFFECTED PARTIES					
Landowner/s					
Klipspruit 138 IT - Portion 0 & 2 Niketiwe Dlamini	X	25-04-2019(via email) – Scoping phase	• We proposed the meeting to take place on the 23rd of May 2019 Kangra Driefontein Mine.	• The 23rd of May 2019 is perfect we will avail ourself.	
Mooihoek 168 IT Conrad Hiestermann	X	10-05-2019(via email) -	• I Conrad Hiestermann, owner of Mooihoek 168 would like to register as an affected party.	• note that we have registered you as Interested and Affected Party as per your request. All concerns and issues raised regarding the project	

		Scoping phase		are taken into consideration as they will help us to develop a detailed EIA report.	
Mooihoek 168 - Portions 2,6,18,26 **Reheivo Boerdery** Remo Beneke	X	01-05-2019 (via email) - Scoping phase	• we request to register Reheivo Boerdery as interested and affected parties in the coal mining right application as advertised in Excelsior news dated 26 April 2019	• note that we have registered you as Interested and Affected Party as per your request. All concerns and issues raised regarding the project are taken into consideration as they will help us to develop a detailed EIA report.	
JINDAL AFRICA Nevin Tunhuma	X	25-04-2019 (via email) – Scoping phase	• No comments have been received as yet.	• No response has been received from Jindal Africa however Lazelelihlokohloko will continue with the consultation process. Mr Nevin was invited to the meeting on behalf of Jindal Africa.	
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties					
	X				

Municipal councilor					
Municipality					
T Mazibuko	X	23-04-2019 (via email) – Scoping phase	• No comments have been received.	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder.	
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Lazarus Masuku Cindy Benyane	X	25-04-2019 (via email) – Scoping phase 22-05-2019(via telephone call) – scoping phase	• No comments have been received as yet.	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder. • A call was made to 013 752 4054, however till to date, no responds have been received concerning the land claim outcomes. The Applicant is determined to contact the land enquiry throughout.	

environmental affairs Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA Ramavhona TRamavhona	X	25-04-2019 (via email) – Scoping phase	• No comments have been received.	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder.	
MPUMALANGA PROVINCE REPUBLIC OF SOUTH AFRICA Regional Director: Mr A Mkabela	X	25-04-2019 (via email) – Scoping phase	• No comments have been received.	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder.	
water & sanitation Department: Water and Sanitation REPUBLIC OF SOUTH AFRICA Nevondo Seani Pieter Ackerman	X	25-04-2019(via email) – Scoping phase	• The Department of Water and Sanitation has noted your Notice for Mining rights by Lazalelihlokohloko Mining Projects (Pty) Ltd. We have noted that you will be applying for an Integrated Water use Licence with our Department, kindly apply through our online eWULAAS system. I am currently working for the Vaal and Orange water Management areas and you can further send requests regarding the area. However do Notify Mr Mbulaheni Lindelani for all projects within the Olifants water management area	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder and also a draft scoping report was delivered to Ms. Nevondo on Friday the 25th of April 2019.	.

			for further assistance. Do not hesitate to ask further questions regarding your application.	• Mr Mbulaheni was further consulted however no response was received.	
MPUMALANGA THE PLACE OF THE RISING SUN Khumbelo Makhuvha	**X**	25-04-2019(via email) – Scoping phase	• No comments have been received.	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder.	
agriculture, forestry & fisheries Department: Agriculture, Forestry and Fisheries REPUBLIC OF SOUTH AFRICA Mary Mogale	**X**	25-04-2019(via email) – Scoping phase	• No comments have been received.	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder.	
labour Department: Labour REPUBLIC OF SOUTH AFRICA	**X**	23-04-2019 (via email) – Scoping phase	• No comments have been received.	• BID, DMRE letters and Google earth view were sent as part of the consulting email to the stakeholder.	

Isaac Lidwaba					
Jan Oliver	X	23-04-2091 (via email) – Scoping phase	• No national roads will be affected by the Mining Right Application. SANRAL therefore has no objection to the application nor comments. No national roads will be affected by the Mining Right Application.	• Thank you for your response, we will act as stated in the letter.	
Herry Ludere	X	14/05/2019(via email) – scoping phase	• Please receive attached Eskom Distribution Consent Letter, Annex D & E and map layout. If you accept Eskom's condition please complete Annex D and E and send back to me before commencement of the project.	• Thank your comments will be incorporated into the final EIA.	

Online Consultation		14/11/2022 (SAHRA online portal – Scoping phase	proposed development is located within an area of moderate and very high Palaeontological Sensitivity as per the SAHRIS PalaeoSensitivity map. As such, a field-based based Palaeontological Impact Assessment (PIA) is requested to be undertaken by a qualified palaeontologist	Palaeontology Study was conducted and uploaded on SAHRA online portal.	
Communities		02/05/2022 (face to face) – Scoping phase	How is the proposed project going to affect us. Mines come and promise us nice things then they do not deliver.	An Agricultural Impact assessment which is part of the 106 days will be done and consultation with the landowners and farmers will be held whereby issues will be addressed, either moving the farmers or remaining as the specialist studies are being done. If there's a need for farmers to be moves, thus it will be engaged during the 106 days. At the back of the background Information Document (BID) there is a comment sheet where you can comment or raise issues. Please notify others if you see the notices as we cannot reach everyone by emails and newspaper some people do not have emails. Please note that	

				this is not the last meeting. We are still going to have meetings.	
			• Rivers and streams get affected. • What is the guarantee? • What about the attendance? some people don't even know about this meeting. • There are a lot of communities affected and this is not even half.	• Emails for consulting were sent and other lawyers were consulted with a request to inform those that might be interested or affected by the project proceedings.	
			• How certain are we that we as the community in large we will benefit from the mining activity.	• The reasons why mines/workers are striking is because there is a gap between the LED and the SLP. There must be communication between the SLP and the LED. We come to you with the action plan. We are trying to close the gap with a FET. CSI from the mine, which is committed in the development of the community. We are coming to you with the SLP to make sure that people around the area are employable. MQA= we want to train people who will at the end get certificates. We will develop a data base.	

		• Some Coal mine around once closed because their SLP was disorganised. The SLP letters are only verified and issued by my office and I will also need a Bar. • How do you make sure that the community is informed about the project? • Please visit the mines every time when it starts operating so that you ensure that all the commitments, they said they will fulfil is indeed adhered to. • Will you only hire people with experience ?	• Yes Sir So, the BAR will be left here for your attention because even other departments have been requesting for the BAR. • we plead with the community to work with us, especially about informing others about the project. • Your request is noted and it will be implemented. • we want to bring a machine called simulator, where people will be trained for six months. A simulator is a machine that mimics the mining environment. Surrounding mines will be allowed to use the machine.	

Traditional Leaders					
N/A					
Other Competent Authorities affected					
Interested & Affected Parties					
Bradley Gibbons		29/04/2019 (via email) – Scoping phase	• I would like to register as an interested and affected party for this application with reference: MP 30/5/1/2/3/2/1 (10230) MR.	• Please note that we have registered you as a I & AP. Kindly find the attached Background Information Document where you can raise your issues and concerns about the proposed project.	

7 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE DEVELOPMENT FOOTPRINT

Specialist studies were conducted during the proposed project's EIA phase (see **Table 16** below).

Table 16: Specialist reports conducted during the EIA phase and associated appendices.

Specialist study	Appendix
Hydrological study	Appendix 8
Geohydrological Assessment (Groundwater)	Appendix 8
Soil, Land Use and Land Capability Assessment	Appendix 8
Competent Person Report (CPR)	Appendix 8
Traffic Impact Assessment	Appendix 8
Blast Impact Assessment Report	Appendix 8
Mine Work Programme	Appendix 8
Heritage Impact Assessment	Appendix 8
Blast Impact Assessment Report	Appendix 8
Geotechnical	Appendix 8
Waste Classification	Appendix 8
Palaeontology Study	Appendix 8

The following section provides the baseline bio-physical and socio-economic environmental conditions currently present on the project site, obtained from the aforementioned specialist reports and inputs were required.

7.1 Description of current land cover

Land cover information is a crucial reference dataset that informs a variety of activities ranging from environmental planning and protection, development planning, economic development, compliance monitoring, enforcement and strategic decision making. When the global accessibility of Landsat 8 satellite imagery became available, it offered the opportunity to create the national land-cover dataset for South Africa, circa 2013-14, which replaced and updated the previous 1994 and 2000 South African National Landcover datasets (GEOTERRAIMAGE, 2015). The 2013-14 National Landcover dataset is based on 30 m x 30 m raster cells and is ideally suited for ± 1:75,000 - 1:250,000 scale GIS-based mapping and modelling applications. From the 2013-14 National Landcover dataset, the current land cover for the study area included multiple classes, the majority being: cultivated commercial fields, cultivated commercial pivots, natural and wetlands (see **Figure 21** below).

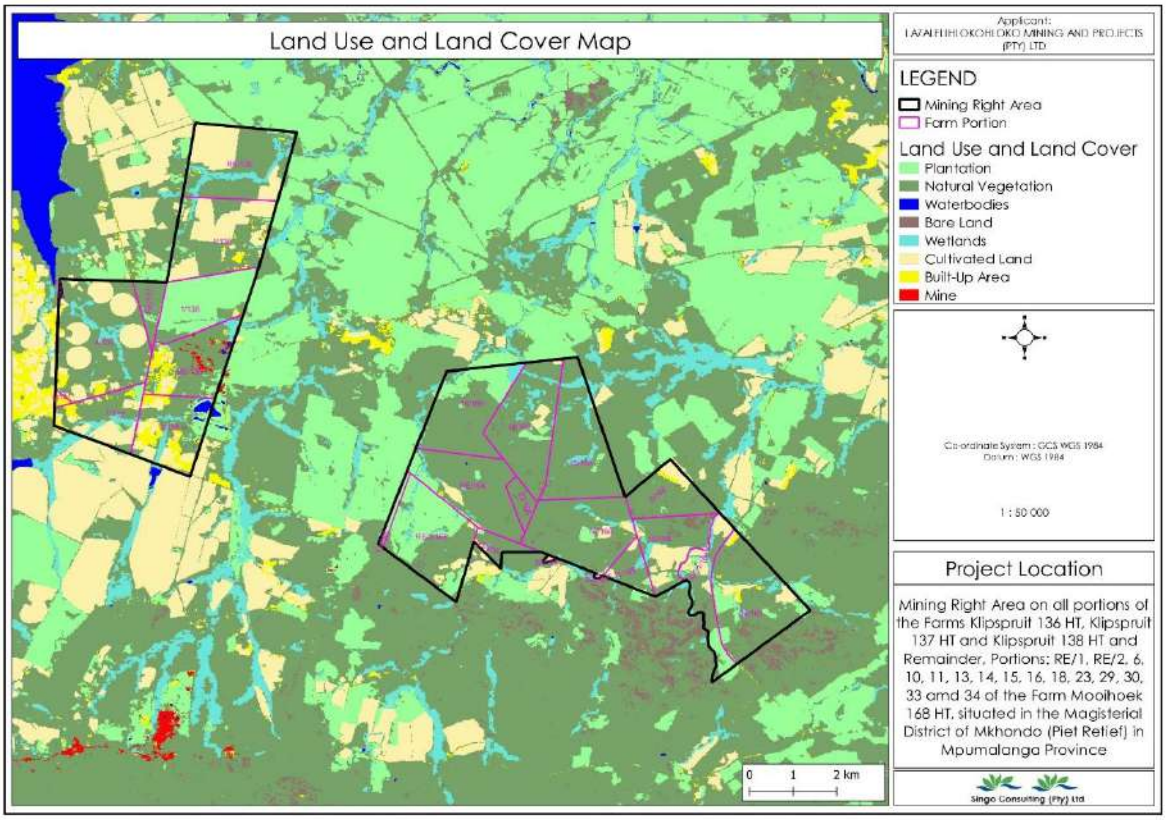


Figure 21: The study area in relation to current land cover.[Singo Consulting, 2022].

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The vast majority of the land is used for agricultural purposes, like maize farming, and includes grazing for livestock and Plantation. Sections of cultivation and wetlands are also included in the study area. The area mainly compromises cultivated lands and falls under CBA irreplaceable, ESA local corridor, heavily/moderately modified old lands and other natural areas (Figure 22).

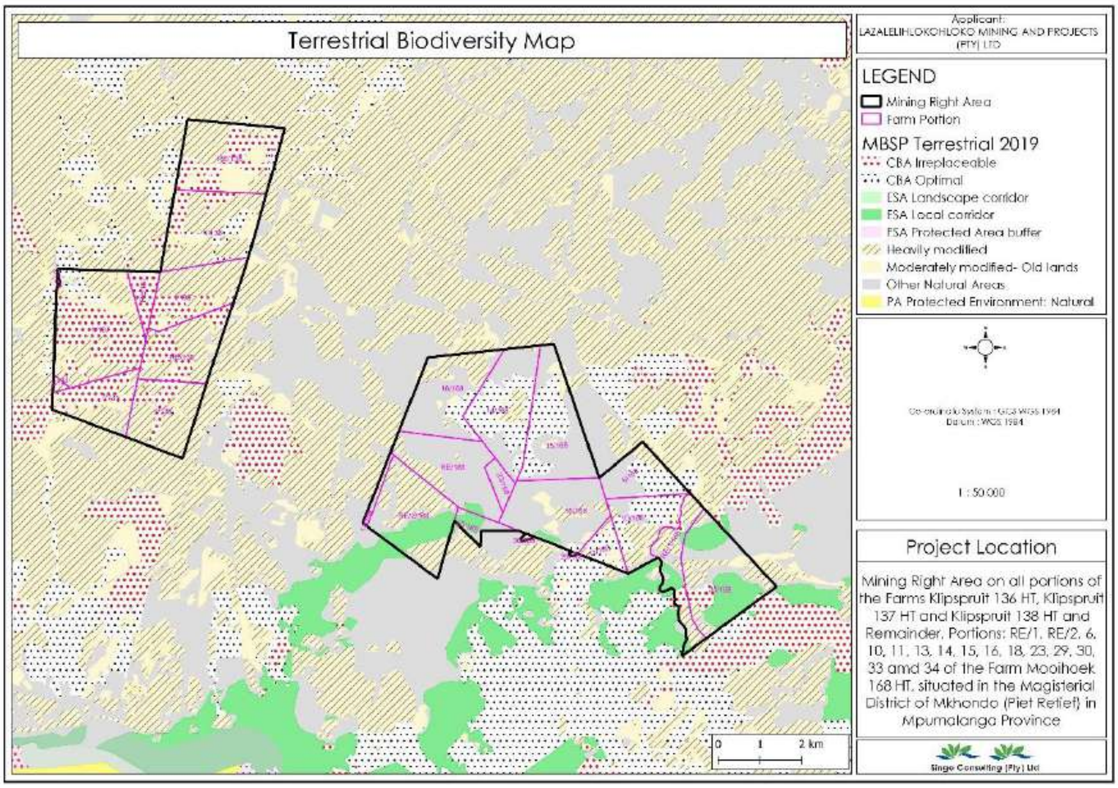

Figure 22: Critical biodiversity of the area.[Singo Consulting,2022].

7.2 Geology

The geology information of the proposed project has been compiled by Singo Consulting (Pty) Ltd, the results contained in this section therefore are a result of the CPR compiled by the mentioned company on Appendix 8.

7.2.1 General geology

The Karoo Supergroup is underlain by the Witwatersrand, Ventersdorp and the Transvaal Supergroups. The latter was deposited during the Archean period (3.1–2.0 MYA) followed by the deposition of the Karoo Supergroup on top of the latter during the Phanerozoic period (60 MYA) (McCarthy and Rubidge, 2005). The main Karoo Supergroup basin covers over 50% of South Africa’s surface and it is made up of five groups namely Dwyaka which preserves evidence of the widespread Gondwana glaciation in the form of glacial sediments (diamictites & tillite) followed by the Ecca Group which is known as the ice age which preserves records of sedimentation in a shallow, landlocked sea and it is a coal bearer; The overlying Beaufort Group whereby the sediments mark a period of extensive flood plains in warmer and drier climates, with sedimentary input from all directions during the early Triassic period (~260 to 210 Ma); followed by the Stormberg Group which marks the return of semi-arid and arid conditions during the late Triassic period (~210 Ma) then lastly the Drakensberg Group which was deposited during early to Middle Jurassic period (~180 Ma) and it is dominated by the flood basalt. The sedimentary sequence represents environments ranging from glacial to arid and it is capped by the basaltic lava of the Drakensberg group.)

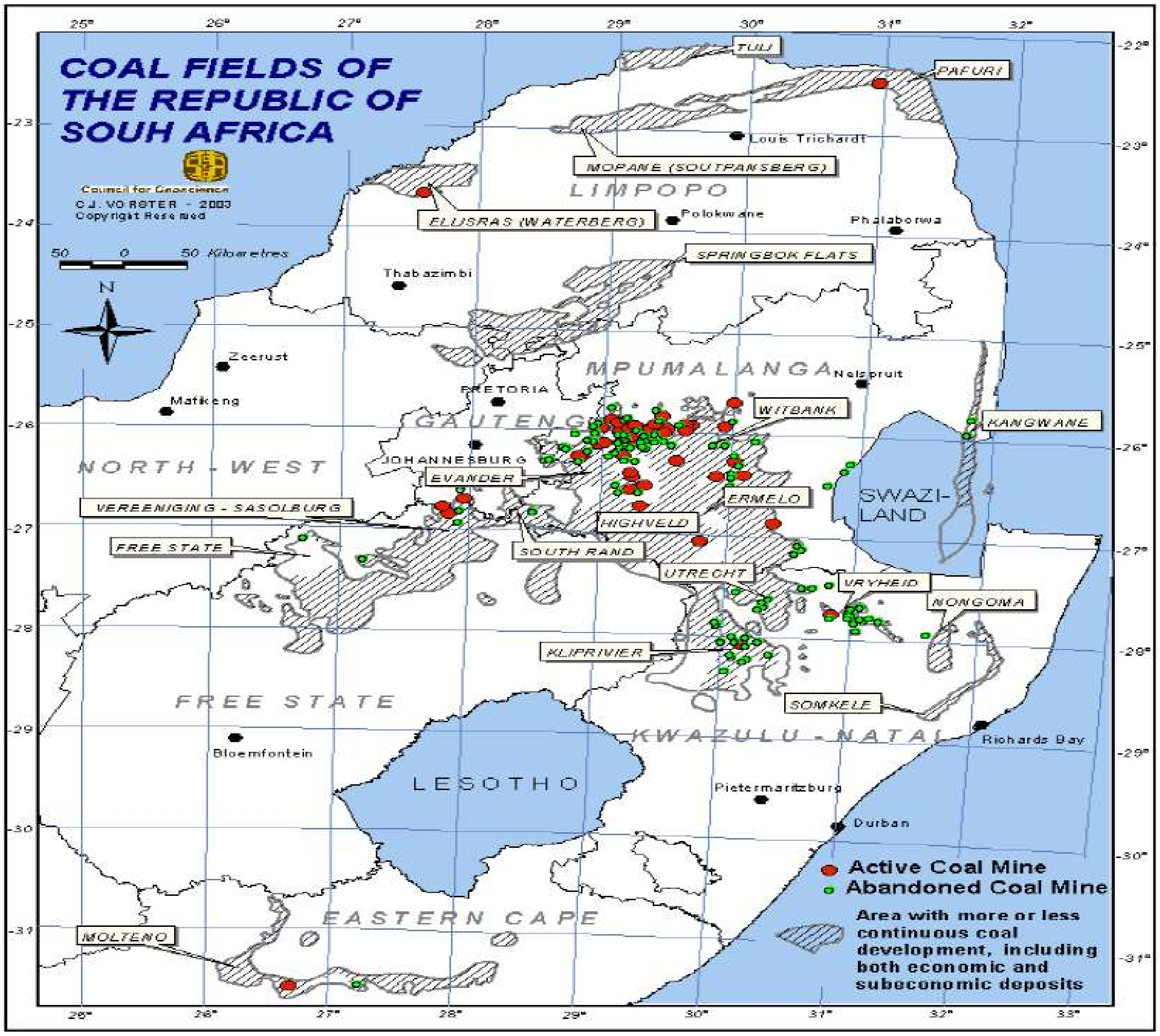

Figure 23: Coalfield map of South Africa, [Source - Council for Geoscience ,2003].

Dwyka Group

It is dominated by diamictites, conglomerates, black shales, mudstone, siltstone and sandstones with thin coal beds (Paul & Selden, 2012). The Group consists mainly of diamictite (tillite) which is generally massive with little jointing, but it may be stratified in places. Subordinate rock types are conglomerate, sandstone, rhythmite and mudrock (both with and without dropstones). In the southern part of the

basin, under the influence of the Cape Fold Belt, the diamictite display a distinctive ‘tombstone’ morphology because of selective weathering along axial-plane cleavage.

Ecca Group

The proposed study area is also covered by the Ecca Group (Vryheid formation) of the Karoo Supergroup. The coal bearing group is the Early Permian-age Ecca Group, which primarily consist of siltstones, organic-rich mudstone, sandstone and minor conglomerates which were deposited on the northern shoreline of the Karoo Sea under warm climate conditions in shallow water deltas and wetlands (Catuneanu et al., 2005). The Ecca group produces abundant coals in its marshy depositional environment, mostly in the northern part of the basin. The Ecca group contains almost all of South Africa’s coal resources and it is made up of sixteen formations, but our main focus or interest is the Vryheid formation which comprises mudrock, rhythmite, siltstone and fine- to coarse-grained sandstone (pebbly in places). The Formation contains up to five (mineable) coal seams. The different lithofacies are mainly arranged in upward-coarsening deltaic cycles (up to 80m thick in the southeast). Fining-upward fluvial cycles, of which up to six are present in the east, are typically sheet-like in geometry, although some form valley-fill deposits. They comprise coarse-grained to pebbly, immature sandstones - with an abrupt upward transition into fine-grained sediments and coal seams since it covers the proposed prospecting area.

Volksrust Formation

Volksrust Shale Formation to the old “Upper Ecca Beds”, with the choice of name based on a description given by Blignaut et al. (1952). The Volksrust formation mainly comprises of silt-rich, grey to black shale containing thin, bioturbated siltstone or sandstone lenses. Deposits of this formation interfinger laterally with the underlying Vryheid Formation and overlying Beaufort Group rock deposits. The rock sediments are fine-grained overall, indicating that the rock sediments were deposited in both lacustrine to lagoonal and shallow coastal settings. The general thickness of the unit is between 150-250m and it is dominated by dark grey-green siltstones and mudstones, with phosphatic/carbonate/sideritic concretions. Cadle (1975) documents that the Volksrust Formation shows an overall coarsening-upward trend. Coals occur interbedded with the mudstones in places. The Volksrust Formation is postulated to have formed in shallow to deep water basinal conditions.

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7.2.2 Local geology and coal seams

The local Geology of the project area is comprised of Alluvium, Vryheid Formation and the Karoo Dolerite suite, see **Figure 24**.

Alluvium

Alluvium is loose, unconsolidated soil or silt that has been eroded, changed in some way by water, and then redeposited in an area that is not marine. Various elements including silt, clay, 7 tiny particles, and sand make up most of the alluvium. It is referred to as "cover" because these sediments conceal the underlying bedrock and are quite recent (Quaternary in age). The ultimate source of alluvium is weathering and erosion of bedrock like basalt or granite, as well as other unconsolidated sedimentary deposits like colluvium (deposited by gravity), loess, or eolian sand (deposited by wind), or alluvium itself. Important alluvial characteristics include composition, texture, and landform, which eventually affect the characteristics of alluvial soils. (Boettinger, 2005). The Project area is mostly covered by alluvium therefore, according to the the (USGS- Scientific Investigations Report 2013–5185) there are two methods that can be used can be used to calculate the alluvial diamond resource within diamond-bearing zones, integrating measurements of the volume of alluvium based on drainage system models and the other examining historical data.

Vryheid formation

The majority of the economically extracted coal in South Africa occurs in rocks of the Vryheid Formation, which ranges in thickness in the MKB from less than 70.0 m to over 500.0 m. It is thickest to the south of the towns of Newcastle and Vryheid, where maximum subsidence took place (Du Toit, 1918; Cadle, 1975; Whateley, 1980a; Stavrakis, 1989; Cadle et al., 1982) and where the basin was the deepest. The fundamental idea, distinctive characteristics, and borders of the Vryheid Formation, as described by Du Toit (1954) and others, are those of the "Middle Ecca," according to SACS (1980). Studies on the Vryheid Formation were primarily stratigraphic before 1973. When Hobday (1973) proposed deltaic depositional systems for the Vryheid Formation, this scenario altered, and academic investigations shifted to a focus on the deposition process. Rapid sediment flow into the basin was caused by bedload-dominated fluvio-deltaic systems that prograded south and southwest and had source areas to the northwest, north, northeast, and east of the current basin edge (Cadle, 1974; Hobday, 1973; Ryan, 1968). (Cadle and Cairncross, 1993).

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The Vryheid Formation's stratigraphy is currently characterized as a series of five coarsening-upward phases that exhibit extraordinary lateral continuity throughout the whole distal portion of the Karoo Basin (Cadle, 1982). Each of the five stages of coarsening-upward begins with a fine-grained marine facies, which progresses into a coarser delta front and delta plain-fluvial facies as it progresses. The Vryheid Formation has a number of coal seams, most of which are connected to the coarser-grained river facies at the top of each sequence. Although there is some debate on the precise correlation in the various coalfields, these coal seams may be tracked laterally across the whole area of occurrence of the Vryheid Formation in the MKB. The South African coalfields have a wide variety of coal kinds (organic content), mineral matter compositions, and ranks (maturity) due to regional variances

Karoo Dolerite Suite

The Karoo Dolerite Suite represents a network of dykes and sills which occur as feeders or tongues to the flood basalt province (Walker and Poldervaart, 1949) and are best developed in the main Karoo Basin. Multiple dolerite intrusion events occurred in the Karoo, both predating and postdating the flood basalts (Erlank,1984; Mountain, 1968; Walker and Poldervaart, 1949), therefore making it nearly impossible to associate them with any single intrusive or tectonic event (Chevallier and Woodford, 1999; Duncan and Marsh, 2006; van Zijil, 2006a0). Because the lowest (flysch) levels of the sedimentary rocks of the Karoo Supergroup are argillaceous and the top (mollase) units are relatively weakly arenaceous, these rocks normally do not provide satisfactory pavement aggregates. The Drakensberg flood basalt eruptions (183–1 Ma), which occurred at the conclusion of the Karoo sedimentary succession deposition, were fed by a vast network of dolerite intrusions, according to Duncan and Marsh (2006). The Karoo Dolerite Suite is the collective name for these intrusions, and they have been successfully and widely employed as sources for pavement aggregate.

Utrecht Coalfield

The Utrecht Coalfield covers 500,000 hectares within the Utrecht and Paulpietersburg magisterial districts (Spurr et al., 1986). The coalfield stretches through the Elandsberg and Schurweberg mountain ranges in a south-westerly direction from the town of Paulpietersburg in the north-east. The Utrecht Coalfield and the northern part of the Klip River Coalfield are divided by a desolate, dolerite-intruded terrain at the western boundary. The boundary is drawn along the Pongola River and the Loskop fault in the northern region, where the Utrecht Coalfield and the Ermelo Coalfield are next to each other.

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The Vryheid Formation's total thickness in the area ranges from 300 m in the west to 380 m in the east. The coal zone, which includes the sedimentary succession from Coking to Fritz seams are characterized by fluvially dominated, fining-upward, carbonaceous fines typically cap conglomeratic sandstone cycles or even coal One or more regressive deltaic deposits dominated by sandstone. The coal zone is covered by sequences at the surface, the overlying Volksrust Formation occurs northern section of the coalfield. According to Spurr et al. (1986), it is around a borehole drilled on Schurvekopje 128, which was 70 m thick, collared in rocks from the Beaufort Group. This unit, like others in KZN, is dark grey siltstones and mudstones dominate.

The four economic seams present in the coal zone of the Utrecht Coalfield, from the bottom up, are the Coking, Dundas, Gus, and Alfred seams. Other seams, such as the Targas, Rider, Fritz, and Eland are too thin to mine with current mining equipment.

The Coking Seam

The Coking Seam is generally thin, with a maximum thickness of 1.5 m at Makateeskop (Spurr et al., 1986) and an average thickness of 0.9 m. The seam is generally composed of good quality coal, primarily bright, thinly banded coal, with intra-seam partings of sandstone or siltstone where it thickens. Roof and floor rocks are usually competent because they are either medium- to coarse-grained sandstones or medium- to fine-grained sandstones.

The Dundas Seam

The Dundas Seam is located about 15 meters above the Coking Seam and has a maximum documented thickness of 2.6 meters (Spurr et al., 1986). The thickness of the Dundas Seam in the west of the Utrecht Coalfield is highly variable, and where exploited, the seam reached a thickness of approximately 2 m. It was made up of an upper mixed dull and bright ply, a central bright portion, and a bottom zone with mixed coal and fines. It produced bituminous coal and was also used as a source of export quality anthracite by Kangra Holdings at Longridge. Dundas Seam accounts for only 8% of the total Utrecht Coalfield's remaining resource tonnage Historically mined areas. The Dundas Seam roof was generally competent, being made from medium-grained sandstone The floor attendant was inept carbonaceous siltstone and mudstone, which resulted in a variety of mining problems. The seam is thin to the east of the coalfield, but the absence of its quality improves when the bottom and poorer top portions are removed. In this case, both the competence of the roof and floor varies.

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The Gus Seam

The Gus Seam is located approximately 17 meters above the Dundas Seam and was the most heavily worked seam in the Utrecht Coalfield. It has a maximum thickness of 3.3 m and an average thickness of more than 1 m in the coalfield's southern part. To the north, the seam divides into two sub-seams separated by a 3-12 m thick sandstone parting. The Gus Seam in the vicinity of Utrecht can be divided into three distinct quality zones or plies. The upper portion of the seam is mostly dull coal, the middle portion is mostly bright coal, and the bottom portion is mostly poor-quality dull coal with a consistent siltstone or mudstone parting. At the Kempslust Colliery, where thinly laminated fine-grained sandstone formed an extremely incompetent roof, the seam roof and floor competence ranged from fairly high to severely poor (Spurr et al., 1986). The Gus Seam, which ranks second behind the Alfred Seam in the Mintek (2007) assessment, is responsible for 30% of the Utrecht Coalfield's remaining resource tonnage.

The Alfred Seam

The Alfred Seam is located about 14 m above the Gus Seam. The seam has a maximum thickness of 3.8 m and an average thickness of 1.9 m. The mineable section at the now-defunct Umgala and Zimbutu collieries was approximately 3m thick (Spurr et al., 1986). The coal is generally dull to dulllustrous, with bright coal interbanded. The Alfred Seam is a composite seam (composed of three separate plies) that ranges in thickness from 1.5m to 3m in places such as Zoetmelksrivier. The upper part of the seam is made up of carbonaceous mudstone and low-quality high-ash coal (N40%). Except near areas of dolerite dyke intrusion, the roof to the Alfred Seam was generally reported to be moderately competent. A medium- to coarse-grained sandstone, strong enough to support mechanical equipment, was typically used to form the floor. For quality reasons, the Alfred Seam was not historically as extensively worked as the Gus Seam. However, in 1981, the Alfred Seam won the majority of the Utrecht Coalfield production (Spurr et al., 1986), as it was worked by both the Zimbutu and Umgala collieries, as well as the Zoetmelksrivier 86 Colliery. According to the Mintek (2007) report, the Alfred Seam is the most important in the Utrecht Coalfield, accounting for 54% of the remaining resource tonnage.

Structure and Intrusions

The Utrecht Coalfield contains five major dolerite intrusions (Spurr et al., 1986), and dolerite intrusions have a significant impact on the rank and quality of the coals in the coalfield. They are also the primary

source of structural discontinuities and faults, with throws of up to 150 m recorded where dolerite sills (particularly the Zinguin Sill) intrude through the coal zone (Spurr et al., 1986). Sills beneath the coal zone have a greater metamorphic effect on the coals than sills above the coal zone. Even with its considerable thickness, the Zuinguin Sill can reach within 50–60 m of a seam and have relatively little impact on the coal, suggesting that it had the lowest temperature of intrusion of any of the dolerites in the Utrecht Coalfield (Spurr et al., 1986).

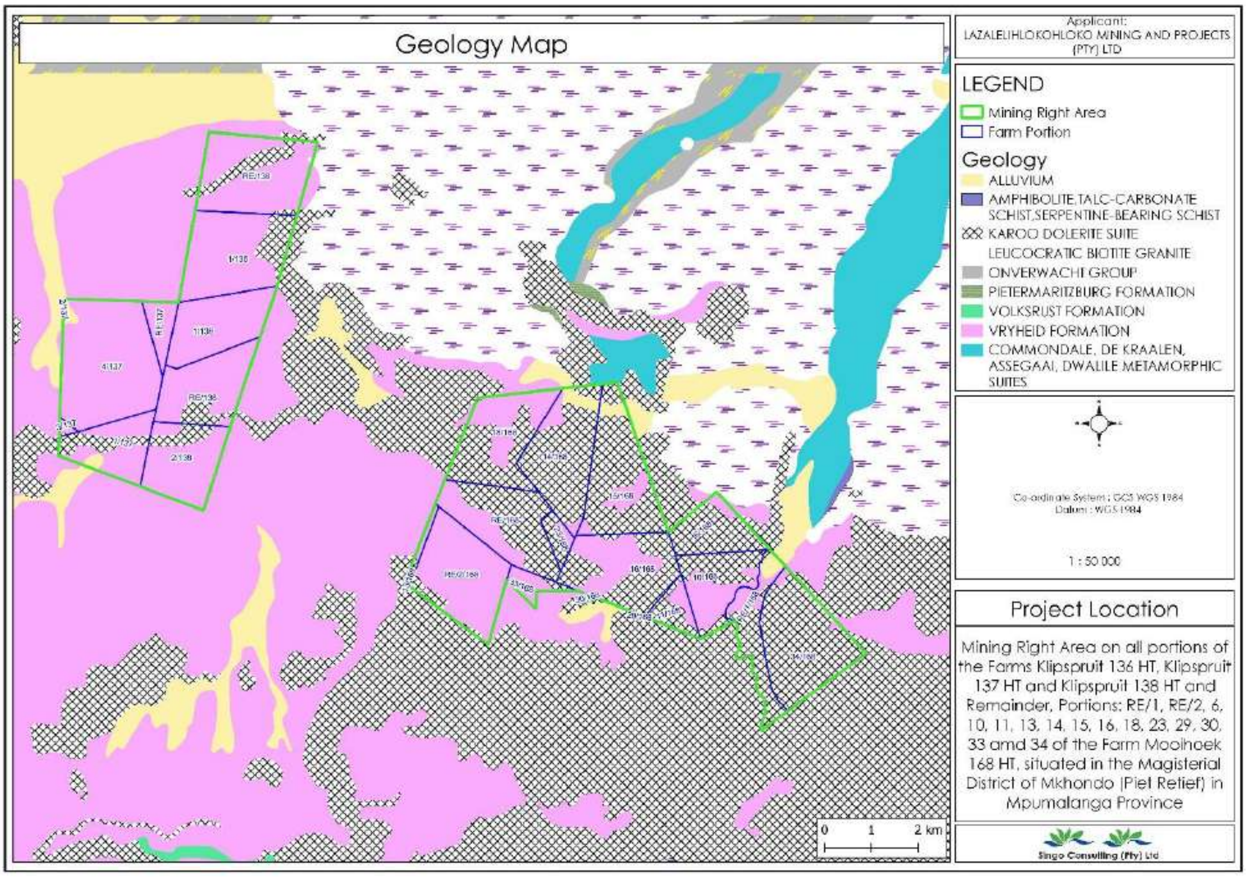

Figure 24: A Simplified geological formations map for the proposed project area.[Singo Consulting,2022]

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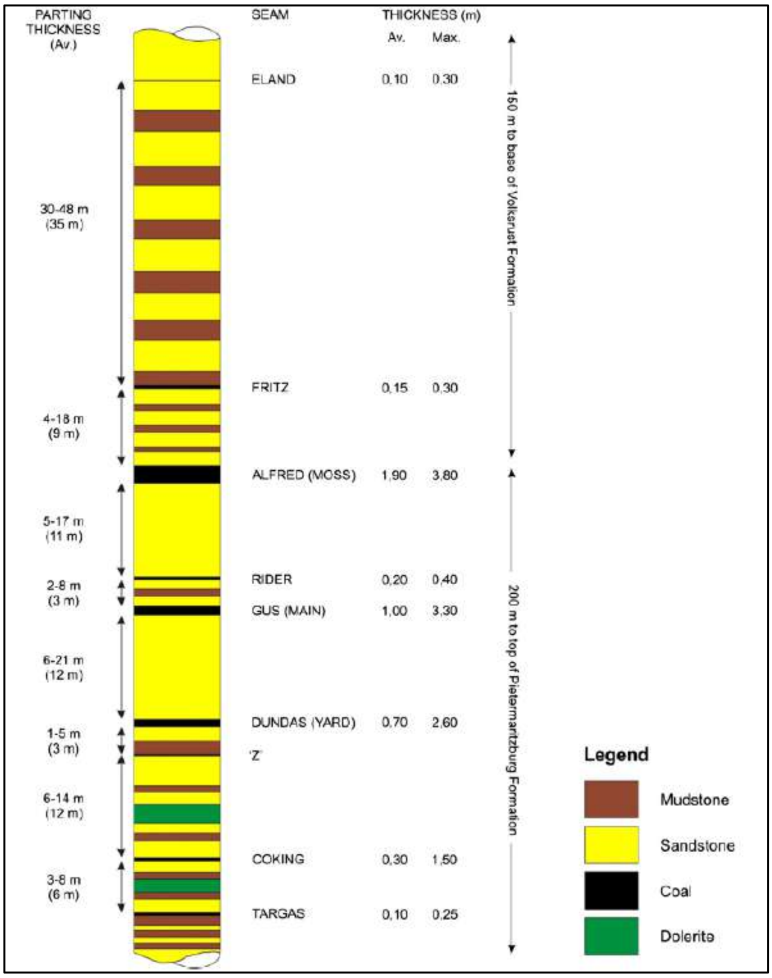

Figure 26: Stratigraphic column of Utrecht coalfield.

7.3 Soil

From the soil study conducted in house, the proposed project area is associated with Association of classes 1 to 4 : undifferentiated structureless soil, Association of classes 13 & 16 : undifferentiated shallow soil & land classes, freely drained structureless, structureless soil. This type of soil can be defined based on their soil depth, soil drainage, erodibility and natural fertility. Figure 27 below for the soil classes map.

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The soils in the area vary significantly in physical and chemical composition over the different areas. They are strongly influenced by the underlying rocks (geology) from which they are derived from through the process of weathering, as well as by their position in the landscape and the origin of the parent material (in-situ versus colluvium derived).

Primary topsoil is the uppermost layer of soil used in site rehabilitation. It is salvaged from the surface horizons of areas to be disturbed, is relatively stable, contains seeds and microorganisms and is relatively fertile. Secondary topsoil (if used) is placed directly in contact with waste rock and may be obtained from subsurface soil horizons, including weathered rock**.** The color of soil identified during site assessment in the proposed area are dark brown to red and light brown.

These colors are caused by accumulations of organic matter in soils. Humus coats the soil particles, giving them a red color. Usually, the darker the color, the more organic matter the soil contains, and the more fertile and productive is the soil where dark colors are typical of A horizon. These are the colors of well-aerated soils well-aerated means that air moves freely into and out of the pore spaces of the soil. Some soils have light brown color where it mixed with sand caused by erosion and weathering but not dominating extending well down into the subsoil. That is usually an indication that top soil layer is become dry fast as sand soil dominated, but because second layer from top soil is dark brown to red color the area is classified as wet area. In wet soils, organic matter breaks down very slowly and the soil is darkened by the partially decomposed organic matter that accumulates.

From a desktop study that was conducted, this map shows that the Mining Permit area is covered with **freely drained structureless soils** and **Undifferentiated structureless soils**.

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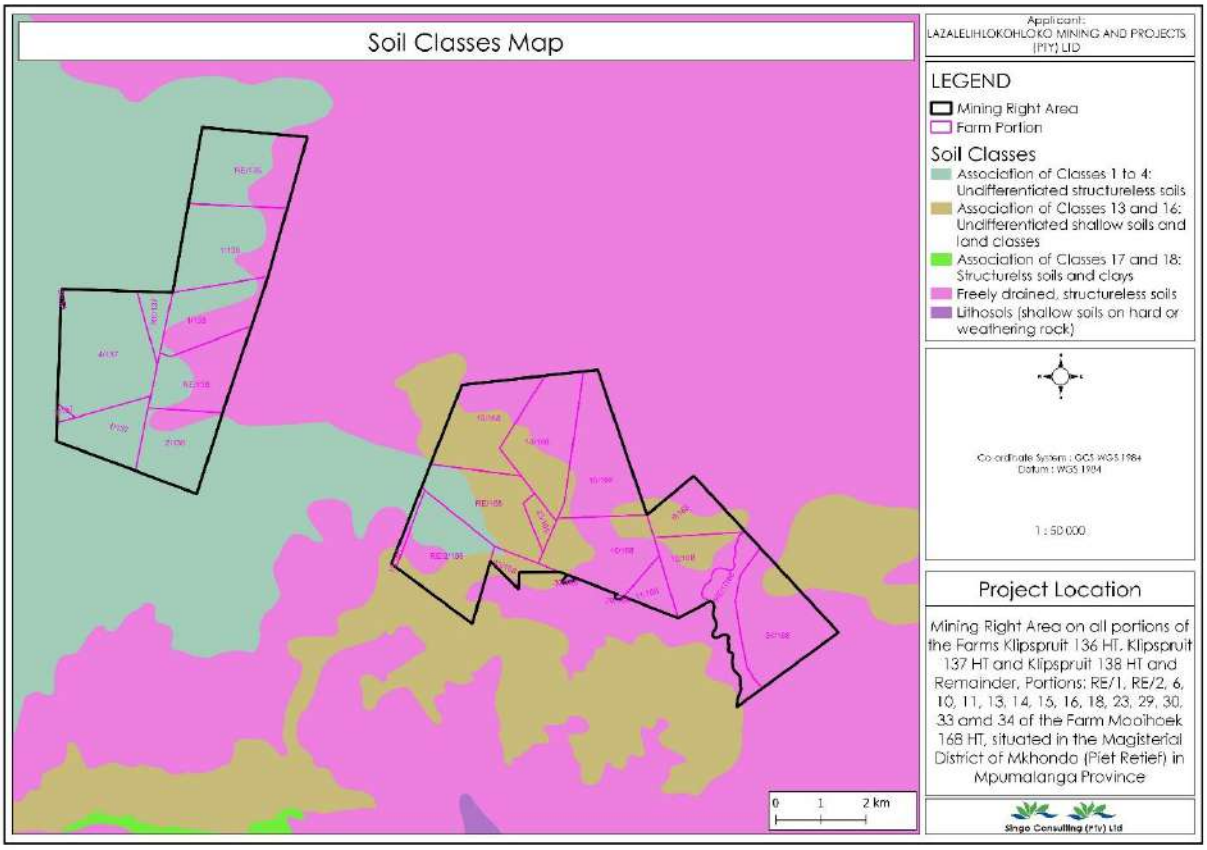

Figure 27: Soil classes map.[Singo Consulting, 2022].

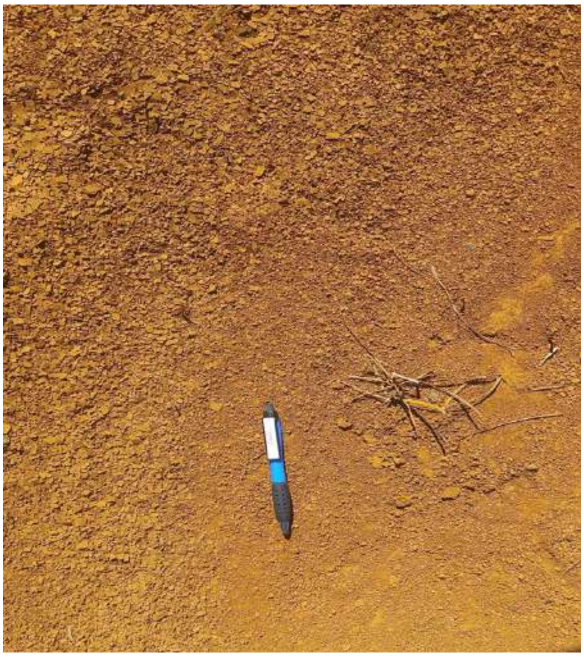

Photo 1: Soil type of the proposed area.[Singo Consulitng,2022].

Recommendations.

- The project operations must stay inside the clearly delineated footprint zones;
- During the construction period, bare soils within the access roads can be routinely moistened with water to minimize dust, especially when strong winds are anticipated according to the local weather prediction; and
- Soil Compaction is usually greatest when soils are moist, so soils should be stripped when moisture content is as low as possible. If they have to be moved when wet, truck and shovel methods should be used as bowl scrapers create excessive compaction when moving wet soils;
- As much as is practically possible, the projected development and construction activities' footprints should be clearly marked to limit vegetation clearing activities inside the infrastructural footprint;

  Usable topsoil from the construction of the surface infrastructure areas must be removed prior to construction and stockpiled separately within the demarcated areas with measures to

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protect this valuable resource from impacts such as chemical contamination as well as mixing with less valuable overburden types.

- Revegetate with an indigenous grass mix, to re-establish a protective cover, in order to minimise soil erosion and dust emissions.
- The post closure land use should be aimed at forestry with indigenous species.

7.4 Climate

The study area is situated in the Mpumalanga Highveld Region, which is a summer rainfall region. The climate is temperate with warm summers and cold, dry winters. Precipitation usually occurs in summer, as mist, rain and hail. Convectional thunderstorms are common and the source of most precipitation. Hail can be expected to occur about six days per year.

The prevailing wind direction throughout the year is from the north-west, but storm winds (i.e. high-velocity winds) generally blow from the south-east, with the strongest winds occurring in late winter and early spring. Maximum evaporation occurs in summer (October-January), due to high summer temperatures. The annual rain fall of the area in question is between 601-800 mm (see Figure 28).

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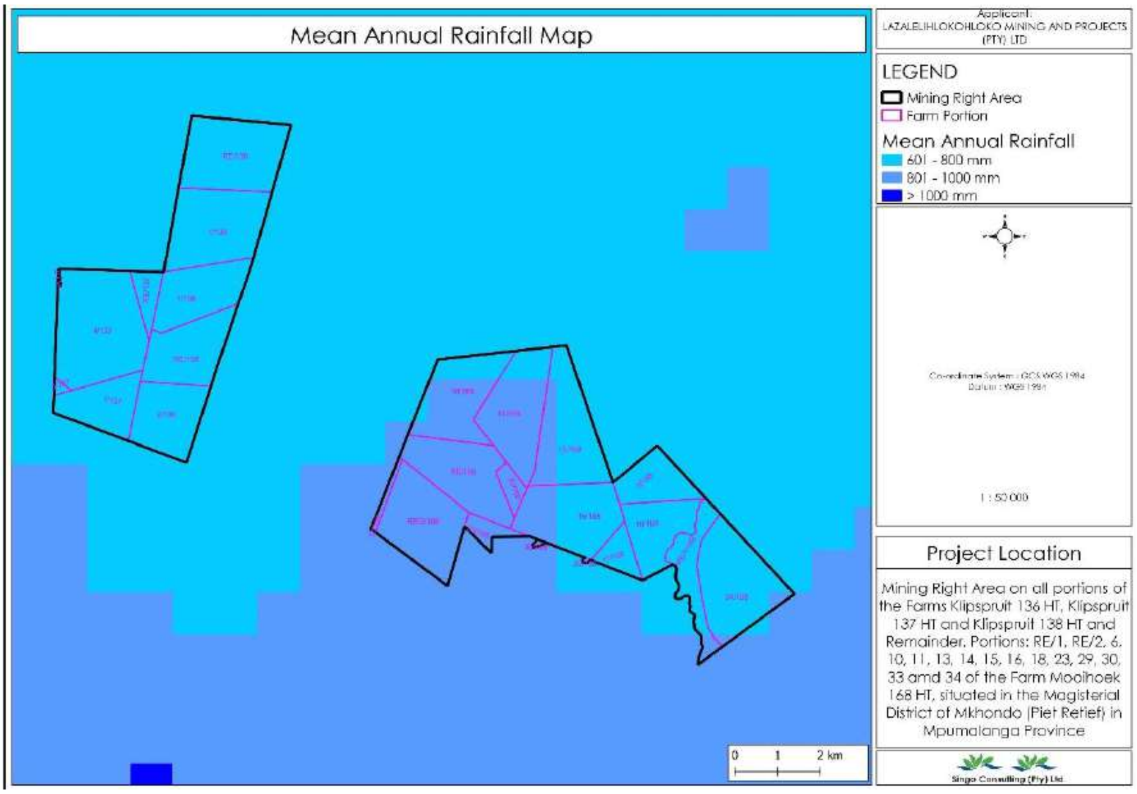

Figure 28: Rainfall in the area.[Singo Consulting , 2022].

7.4.1 Local climate

Piet Retief has the moderate climate prevailing. There is a lot of rainfall in the summer, and in the winter, it is quite dry again. According to Köppen and Geiger (1936), this climate is classified as Aw: Tropical wet and dry or savanna climate. The average annual temperature is 16.1 °C. Precipitation is approximately about mm per year. The temperatures are highest on average in December, at around 954 °C. July is the coldest month of the year, with an average of 1 °C. See **Figure 29** below.

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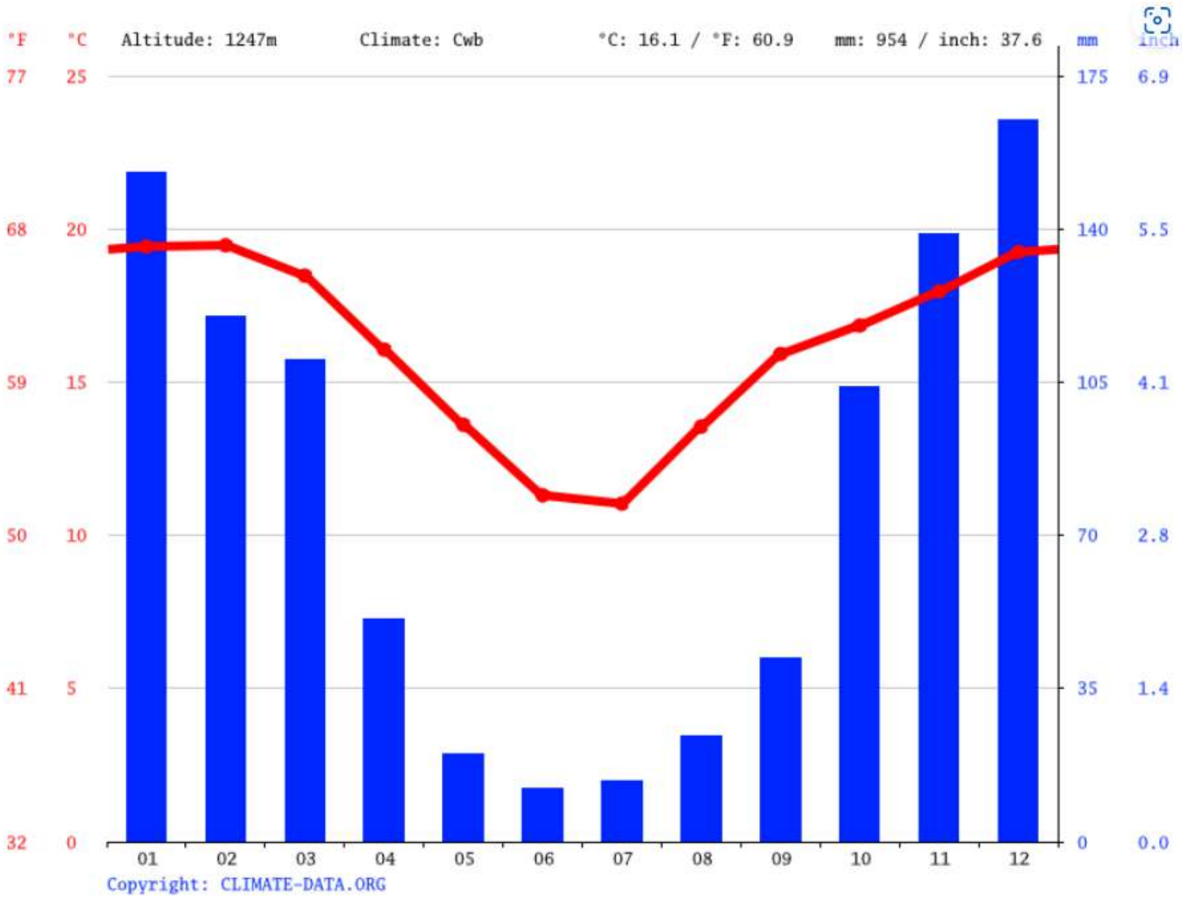

Figure 29: Average temperature and precipitation in Piet Retief. [CLIMATE – DATA.ORG].

7.4.2 Local temperatures, rainfall and wind

The region is the coldest during June when the mercury drops to 0.1°C on average during the night and overall, annual temperatures vary between -1.9 to 0°C, 0.1- 2 °C and 2.1- 4 °C (Figure 30).

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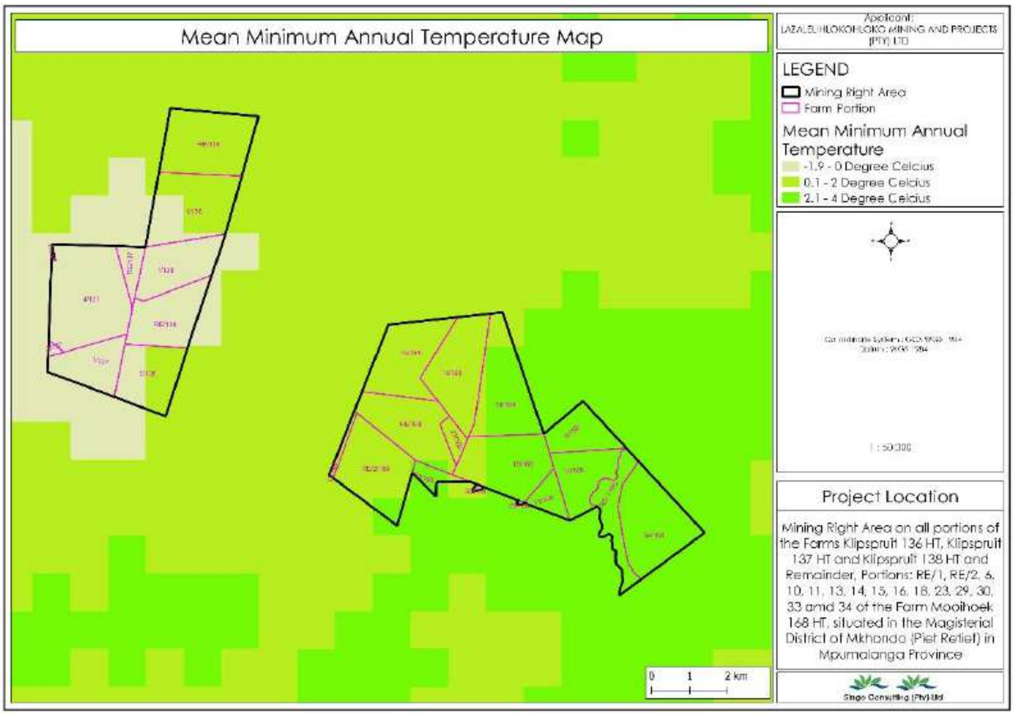

Figure 30: Annual temperature ranges of the project area. [Singo Consulting,2022].

Piet Retief is a slightly moist area. Less rainfall occurs in the area, as shown in Figure 31.

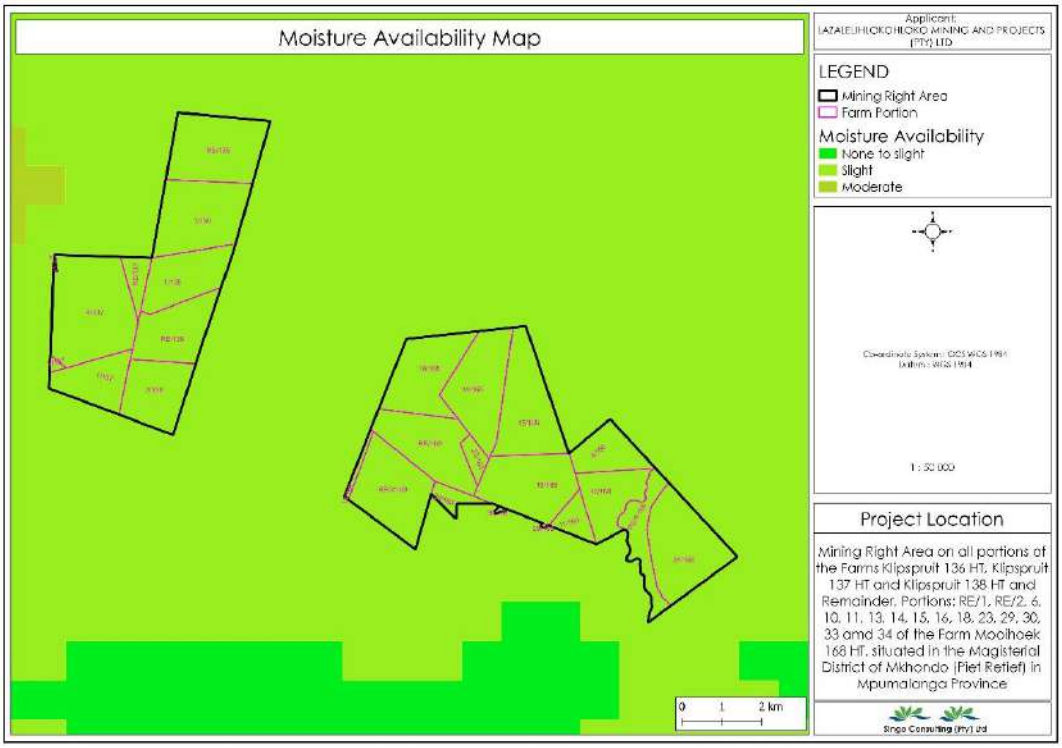

Figure 31: Moisture content Map of the proposed project area.[Singo Consulting, 2022].

7.4.3 Topography

The topology of the area is illustrated below by Figure 32 below. A topographical map shows the physical features of the land. Besides just showing landforms such as mountains and rivers, the map also shows the elevation changes of the land. The topography of the project area is situated in a flat terrain as illustrated by the contour lines below.

Elevation is shown using contour lines. When a contour line is drawn on a map it represents a given elevation. Every point on the map touching the line should be the same elevation. On some maps, numbers on the lines will let you know what the elevation is for that line. Contour lines next to each other will represent different elevations. For example, the further the contour lines are to each other, the gentle the slope of the land.

In this environmental project, topography is used to determine how soil can be conserved and how water will flow over the land. Data from topography can help to conserve the environment. By understanding the contour of the land, scientists can determine how water and wind may cause erosion. They can help to establish conservation areas such as watersheds and wind blocks. In this project contour lines indicates higher chances of soil erosion as they are closely packed together.

The topography of the study will be analysed based on its slope types and landforms observed onsite as well as seen on Figure 32. The highest point in the study area is at an elevation of 1380 mamsl in the northeastern direction and the lowest point is at an elevation of 1220 in the southern direction of the study area.

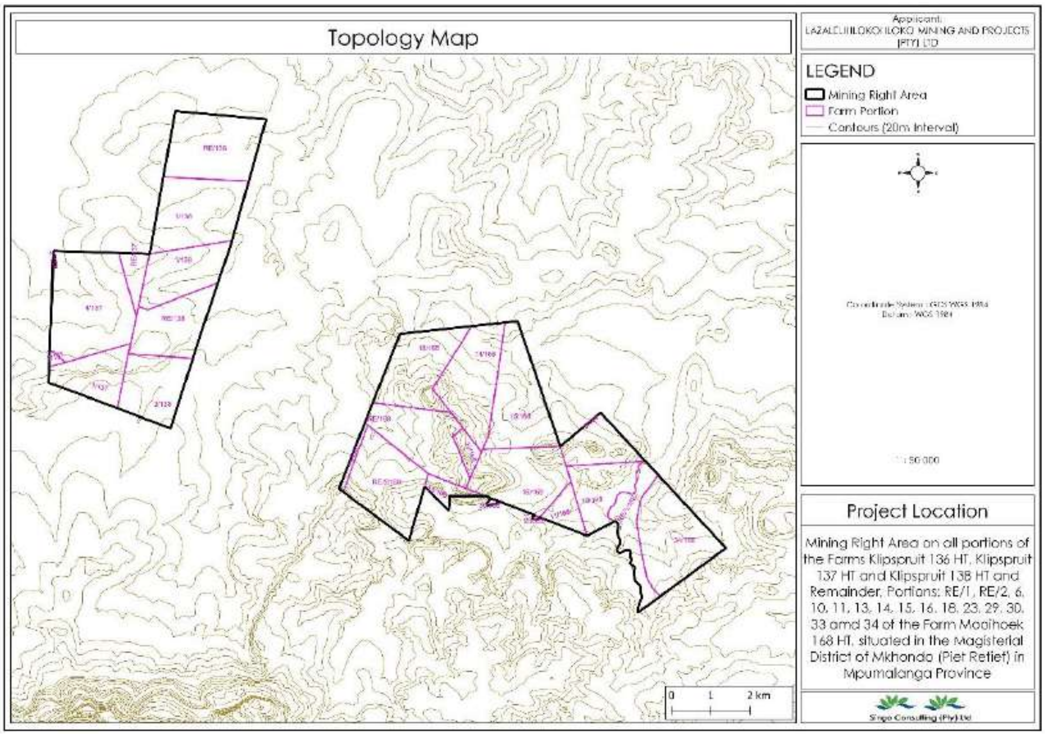

Figure 32: Topography of the project area.[Singo Consulting,2022].

7.5 Surface water

The Surface Water Assessment was undertaken during ground truthing on the 5th of May 2019.

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The proposed Coal mining right area falls within the W51B & W51C quaternary catchment in the Olifants Water Management. The identified water bodies within the mining right area and in the close proximity of the project include the Non perennial river, Perennial river, Channelled valley bottom, Depression and seep . Figure 33 below illustrated the water resources within the project area. The hydrology of the study area shows the presence of water bodies, once identified the project before it commences, the designing of the area will be influenced by the nearby waterbodies. These identified water bodies also recharge groundwater in that area.

Table 17: Water Management Area, QC, Catchment area and MAP.

Quaternary Catchment	Water Management Area	S-Pan Evaporation		Rainfall	
		Evaporation Zone	**MAE (mm)**	**Rainfall Zone**	**MAP (mm)**
W51B	Inkomati-Usuthu	13A	1400	W5A	864
W51C	Inkomati-Usuthu	13A	1400	W5A	903

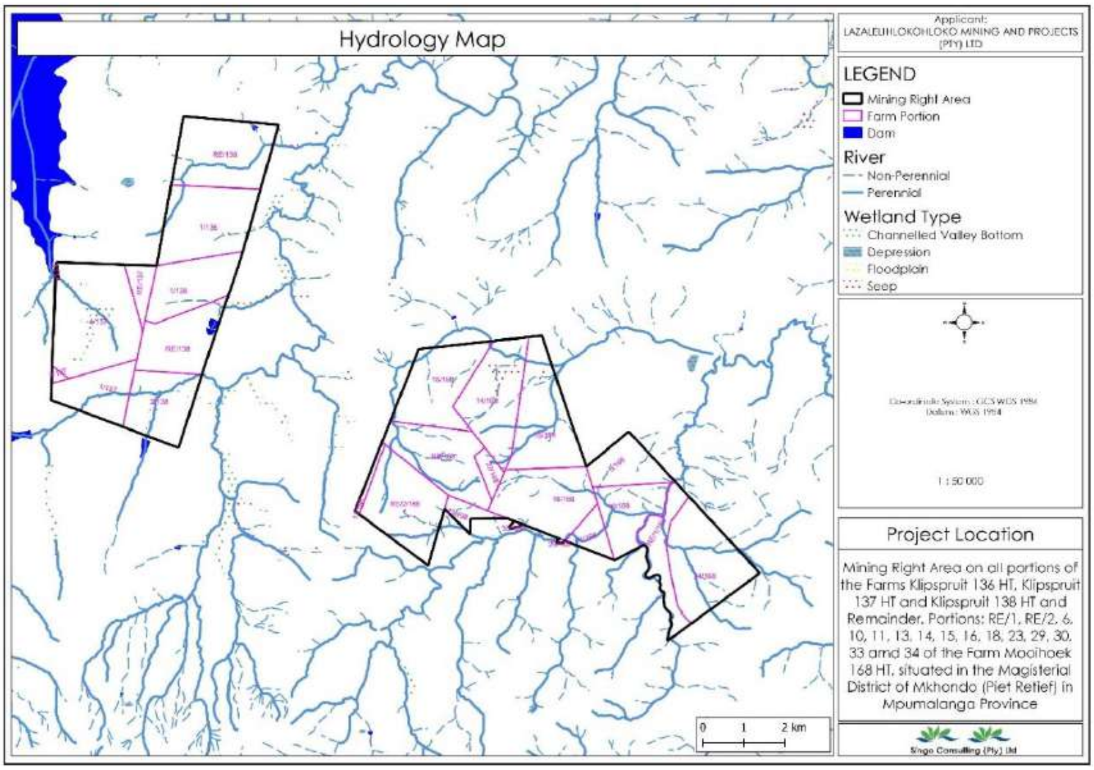

Figure 33: Hydrology map of the proposed area.[Singo Consulting, 2022].

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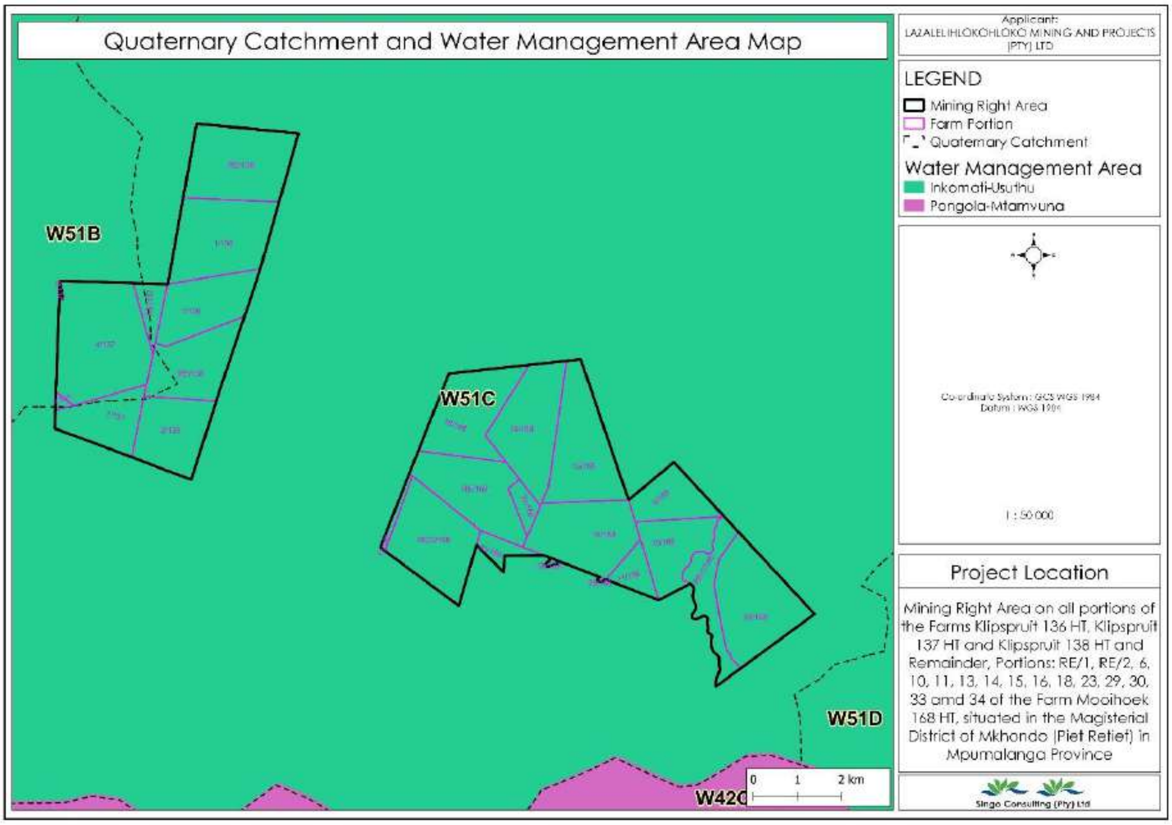

Figure 34: Quaternary catchment and water management area map. [Singo Consulting,2022].

The project area is largely utilized for crop fields with some areas for grazing of livestock. The most significant impacts to the Hydrology of the wetlands is impoundments, abstraction and road establishments. The significant impacts to the Geomorphology result due to in-fillings at impoundments and watercourse crossings; reduced vegetation cover can be included to the impacts to the Geomorphology as this leads to loosened or compacted soils which alter water movement in the soil. The vegetation is considered moderately modified as large areas of the wetland present hydrophytic vegetation; however, vegetation modification with alien invasive species was observed particularly in the depression wetland.

A minimum buffer zone of 500 m is recommended for the wetlands with regards to a mining operation (Macfarlane et al. 2009). These minimum buffer widths (to protect core wetland habitat and aquatic functioning) are calculated based on a simple classification of wetland types and land use categories, broadly grouped as riverine and palustrine systems. Ecological and landscape characteristics are then assessed to establish the need to increase the buffer width, if at all. This buffer zone is determined before mitigation measures have been applied and will be the initial mitigation measure. No post-mitigation buffer is determined due to the nature of the proposed project. It is recommended that all mining and mining related activities be beyond wetland areas and the buffer zone. The determined buffer zones are presented in **Figure 35**. It is recommended that the operational phase buffer zone be applied throughout all phases of the project. Mitigation measures to be implemented during the construction and operational phase have been included in the study conducted in house.

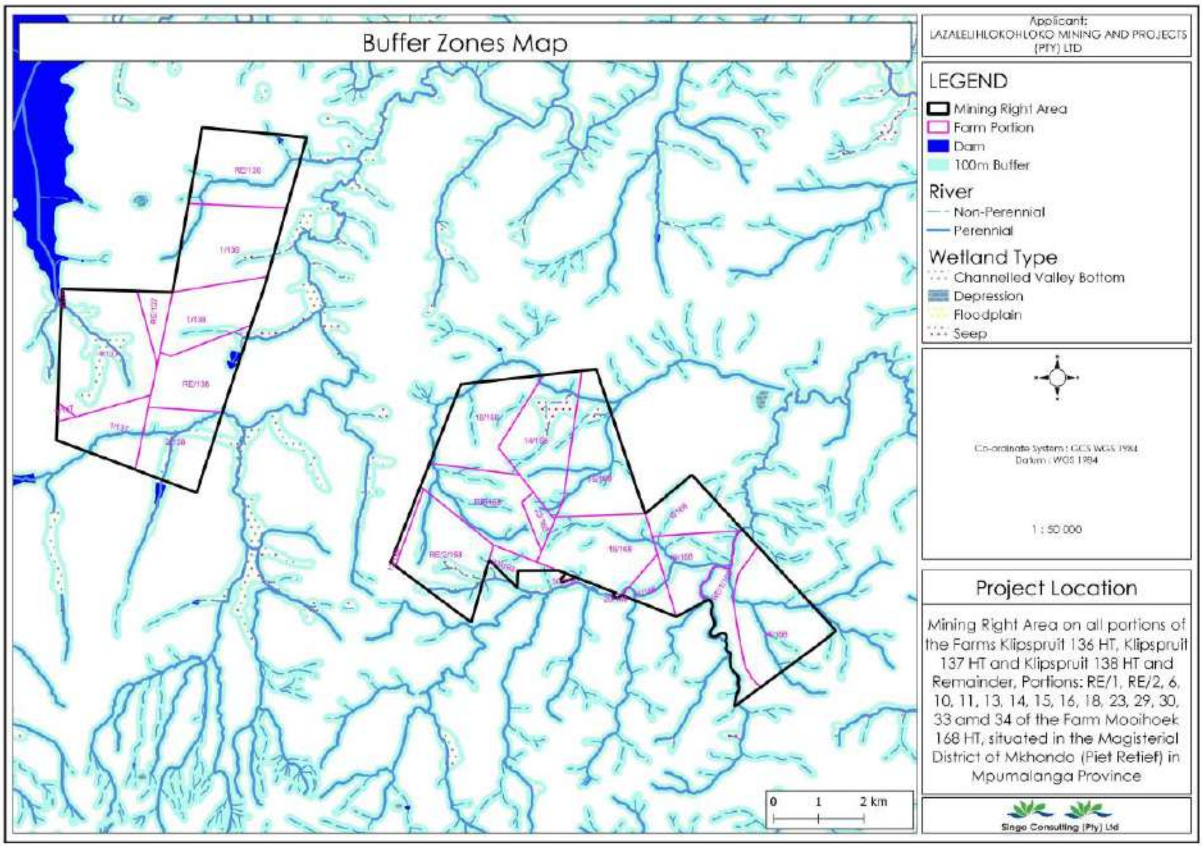

Figure 35: Buffer map of the proposed mining area.[Singo Consulting,2022].

Photo 2: Water bodies observed on site. [Singo Consulting,2022].

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Recommendations:

- Construction should preferably take place in the dry season, as surface water runoff is minimal.
- Additional storm water concentration must be contained.
- Latrines should be kept away from sensitive drainage areas. Temporary latrines used during construction must be connected to the bulk sewerage lines if possible. Alternatively portable latrines should be sealed units that can be cleaned by truck and the waste must be taken to a suitable sewage facility for treatment. They should be well maintained and regularly cleaned and sewage should not be allowed to directly access the groundwater. Latrines must be used as a priority. “Go to the bush” must be prohibited.
- No uncontrolled discharges from the construction camp should be permitted.
- All vehicles shall be properly maintained and serviced so that no oil leaks occur on site.
- Any stockpiled soil and rock should have storm water management measures implemented.
- The large roof structures to be implemented may enhance storm water volumes that need to be managed.
- The storm water canal dumping storm water directly on the site must be rerouted.
- A storm water plan must be available and used during all the phases of construction.
- Vehicles and machines on site must be maintained properly to ensure that oil spillages are kept at a minimum.
- Spill trays must be provided for refuelling of plant vehicles.
- The designing of PCDs, Stormwater management areas, should consider the water bodies, slope and climate of the area, to effectively prevent pollution or contamination.
- The designing of the infrastructures should take into consideration the gentle slope around the mining right area to effectively manage water.
- The area falls on weathered aquifer, wastewater should be properly diverted from seepage, as the aquifer is weathered, and contamination is highly likely.
- Proper stormwater management is recommended to prevent the risk of water resources contamination.

7.5.1 Hydrocensus

The main objective of the hydrocensus (conducted on the mining right farm) is to identify the baseline groundwater use and users in the study area. The project area falls within the **W51B & W51C** quaternary catchment area. Hydro census for the MRA will be conducted during the EIA Phase.

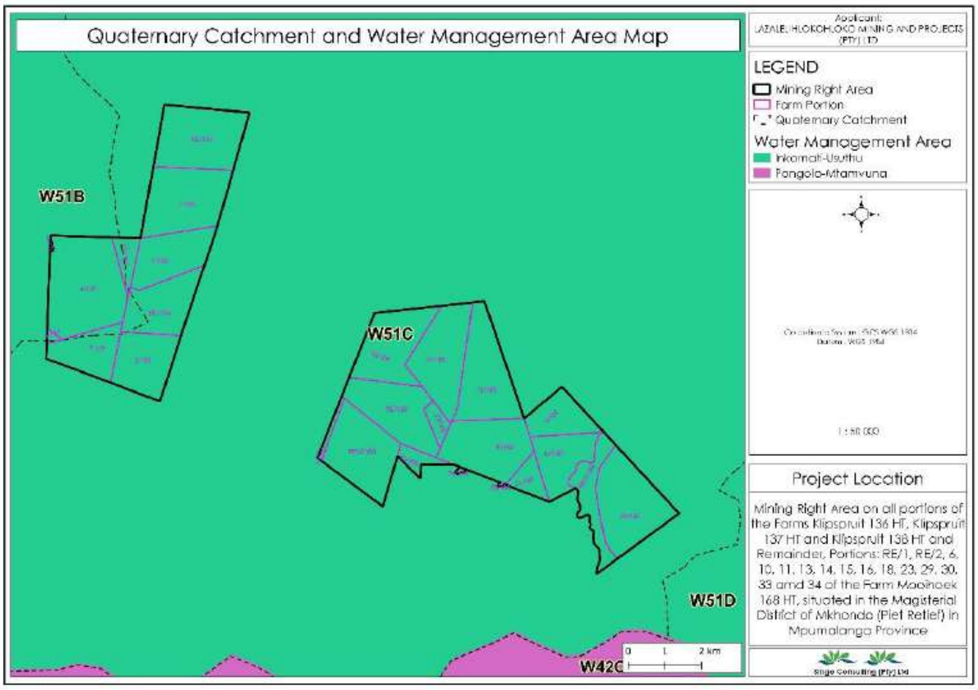

Figure 36: Quaternary catchment (X11A).[Singo Consulting,2022**].**

The Hydrocensus main objective is to record the groundwater data available i.e., counting the number of boreholes if present, recording their names, conditions, coordinates as well as measuring the water levels. This helps to identify the baseline groundwater use and users within the study area.

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7.5.2 Acid mine drainage generation capacity

Acid mine drainage (AMD) poses a serious threat at mines, especially coal mines where there is an abundance of sulphide minerals. AMD is expected to occur due to the extraction of sulphide ores like chalcopyrite, pyrite or arsenopyrite ores. As such, AMD studies must be included as one of the impacts to be mitigated in the mining area. The presence of AMD in a mining area is indicated by a drop in pH.

The following equations show the process of AMD in four steps. This process is self-propagating until the ferric iron or pyrite is depleted. Generally, when pyrite combines with oxygen and water, AMD forms. If AMD gets into surface waterways, the acidity and metal content can produce significant environmental problems over large distances. Once AMD reaches surface water, the acidity may cause significant environmental problems over long distances and destroy the aquatic life.

1. **Oxidation of Polysulfide to sulphate by O_2**

$2FeS_2 + 7O_2 + 2H_2O \rightarrow 2Fe_2+ + 4SO4_2- + H+$

2. **Oxidation of Fe_2+ (ferrousiron) to Fe_3+ (ferriciron) by O_2**

$4Fe_2+ + O_2 + 4H+ \rightarrow 4Fe_3+ + 2H_2O$

3. **Hydrolysis of iron (ferriciron→ferrichyfroxide, “yellowboy”)**

$4Fe_3+ + 12H_2O \rightarrow 4Fe\ (OH)_3 + 12H+$

4. **Oxidation of polysulfide to sulphate by Fe_3+ at low pH**

$FeS_2 + 14Fe_3+ + 8H_2O \rightarrow 15Fe_2+ + 16H+$

Total: $FeS_2 + 15/4\ O_2 + 7/2H_2O \rightarrow 2Fe\ (OH)3 + 2SO_42- + 4H+$

AMD can be treated in various ways, including:

- Increasing pH or raising alkalinity. This can be achieved by adding lime or other alkaline materials to neutralise the acidity (like $NaCO_3$ or NaCl).
- Removing metals like iron, zinc and aluminium from water.
- Conducting passive (limestone leach beds) and active (treatment plants) AMD treatments.

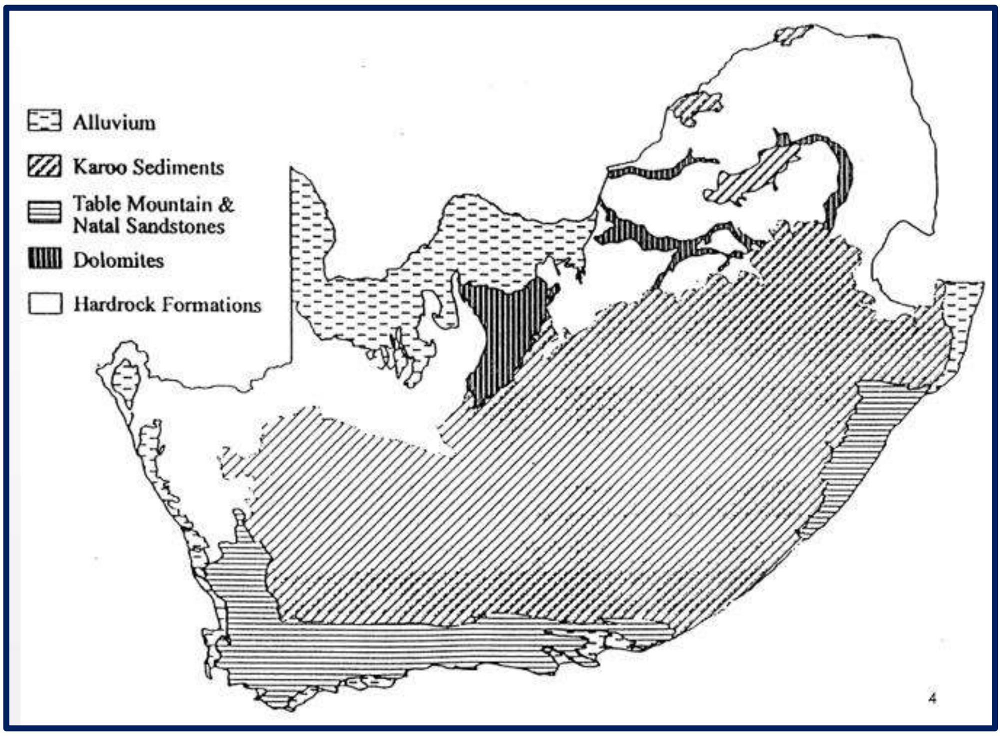

Figure 37: Aquifers of South Africa.

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

7.5.3 Freshwater assessment

A freshwater assessment was conducted by Singo Consulting making use of QGIS for the proposed area. The outcomes of the area showed that the area contains CBA irreplaceable, CBA optimal, ESA local corridor, Heavily Modified , Moderately Modified - old lands and other natural area . This means that the area's desired state is to maintain an at least semi-natural ecological condition. Examples of compatible land use for such an area are low-impacts ecotourism or recreation, sustainably managed rangelands and/or certain forms of low-density housing. The ESA wetland system must be avoided with a 100 m buffer and excluded from any mining activities.

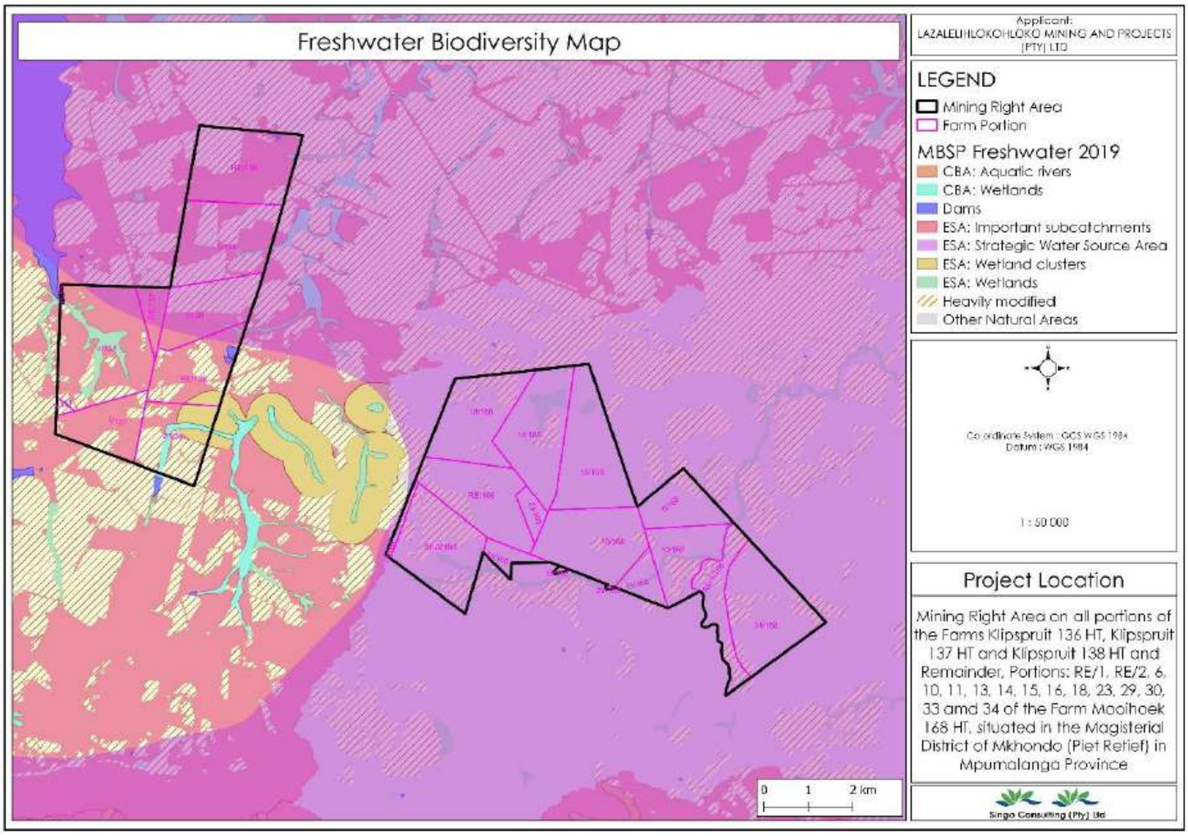

Figure 38: MBSP Freshwater assessment 2019 .[Singo Consulting,2022].

7.5.4 Regional groundwater occurrence and aquifers

The hydrogeology study for the proposed project was compiled by Singo Consulting (Pty) Ltd. The results contained in this section therefore are a result of the hydrogeological assessment compile by the abovementioned company. This study has been included in this report and attached as Appendix 8.

Based on the study area's structural geology and geomorphology, the following characteristics may enhance aquifer development:

- The fractured transition zone between weathered and fresh bedrock
- Fractures along contact zones between the host rocks (usually the result of heating and cooling of rocks in the intrusions)
- Contact zones between sedimentary rocks of different types
- Interbed or bedding plane fracturing
- Openings on discontinuities formed by fracturing
- Faulting due to tectonic forces
- Stratigraphic unconformities
- Zones of deeper weathering
- Fractures related to tensional and decompression stresses due to off-loading of overlying material
- Groundwater occurs within the joints, bedding planes and along dolerite contacts
- Groundwater potential is generally low in these rocks, with 87% of borehole yielding < 3 l/s

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

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

7.5.5 Shallow weathered Karoo aquifer (unconfined): Overburden/weathered zone aquifer

Unconsolidated colluvium and weathered sediments overlie the consolidated formations and dolerite intrusions. The underlying mudstone and siltstone bedrock often result in perched aquifer conditions. The depth of weathering generally ranges between 5 to 12 mbgl in the study area and experiences relatively high recharge from rainfall (3% of MAP) (GCS, 2014). The water level of this perched aquifer is shallow and may daylight as springs occasionally when intersected by barriers such as topography, dykes and basement highs in valleys and topographic lows/depressions (GCS, 2014). This aquifer is low yielding (0.01 – 0.14 l/s) due to the thickness. As a result, groundwater is rarely abstracted from this aquifer. This aquifer is important as it often acts as a pathway for contaminants migrating from surface activities to surface water bodies such as rivers.

7.5.6 Upper fractured aquifer: Unconfined to semi-confined, less than 70-90 mbgl

The Vryheid Formation of the Ecca Group, Karoo Supergroup is characterised by thick sandstone and gritstone, alternated by sandy shale and coal beds. Most of the groundwater flow associated with mining will occur along the fractures, cracks and joints that are present within Karoo Sediments, and along contacts with dolerite intrusions. These conductive zones effectively interconnect the strata of the Karoo sediments, both vertically and horizontally into a highly heterogeneous and anisotropic unit. The dolerite sill and dyke intrusions prevalent in the Karoo Supergroup and the study area generally act as aquitards and compartmentalize the groundwater regime. However fractured contact zones between the host rock and the intrusions often represent highly conductive groundwater flow paths. The horizontally and vertically extensive nature of the dolerite intrusions means that these conductive zones are interconnected and govern groundwater flows. The aquifer characteristics of these contact zones are heterogeneous. The fractured Karoo aquifer can be classified as a minor (low yielding) aquifer system (Parsons, 1995) which displays variable yields and water quality. The Ecca Group is not known for the development of major aquifers, but occasional moderate - yielding boreholes may be present. This aquifer is reported to be approximately 40 m thick and exhibits characteristics of the intergranular and fractured regime (Barnard, 1999), which indicates that groundwater storage and flow occurs mainly within the fractures of the rock. Dominant yield classes vary from the 0.1 - 5.0 l/s ranges.

7.5.7 Local hydrogeology

Three distinct superimposed groundwater systems are present. These are the upper weathered Ecca aquifer, the fractured aquifers in the unweathered Ecca sediments and the aquifer below the Ecca sediments.

7.5.8 Groundwater levels

The depth to groundwater level i.e. the top of the saturated zone generally lies between 5 m and 40 m below surface. The probability of striking water is highest in the first 10-15 m or so below groundwater level. Peak strike depths range from 15-50 m below the surface. Below 50 m strike frequency averages about one third of that between 10 m and 40 m. The chances of striking water are neither enhanced nor reduced by the presence of dykes.

Dykes should not be regarded as hydrogeologically different from the gneisses, granites and granitoids in which they occur, but as part of a hard-rock entirety. Their water-bearing characteristics should be seen neither as barrier nor as conduit, but as variable in the adjoining country rock. Dyke contacts are not per se water strike zones. Success depends on whether country rock, dyke or both are weathered and fractured to below the water level.

Deeper strikes do not necessarily result in higher yields. There is no material difference between shallow-strike and deep-strike median yields. The effect of greater pumping drawdown is apparently counteracted by a decrease of fracture aperture and 5.5 Groundwater potential contaminants.

7.5.9 Regional vegetation

The project area falls within the Savanna biome. This Biome is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It extends beyond the tropics to meet the Nama-Karoo Biome on the central plateau, the Grassland Biome at higher altitudes towards the east and extends down the eastern seaboard interior and valleys where it grades into Albany Thicket in the Eastern Cape.

According to Mucina and Rutherford (2006) the proposed MRA falls within the grassland Biome within the North - Eastern Highveld Grassland vegetation type as per Figure 39 below.

Distribution: The vegetation area is between Mpumalanga and Swaziland, and marginally into northern KwaZulu-Natal: Occurs along the gentle slopes of the Escarpment, from the Phongolo Valley in the south, northwards to the Usutu Valley and to the uppermost Komati Valley near Carolina, including the western grassland areas of Swaziland. Altitude 880 –1 740 m.

Vegetation & Landscape Features: Largely comprised of undulating hills and plains that occur on the eastern edge of the Escarpment. This unit is transitional between the Highveld and Escarpment and contains elements of both. The vegetation structure is comprised of a short, closed grassland layer with many forbs, and a few scattered shrubs on the rocky outcrops.

Conservation: According to (Mucina and Rutherford, 2006) the area is Vulnerable. The conservation target 27% with only 0.4% protected within any formally proclaimed nature reserves (Malalotja, Nooitgedacht Dam and Songimvelo). A number of private conservation areas protect small patches of this unit. It is well suited for afforestation and 30% has already been converted to plantations of alien trees. A further 6% is under cultivation. Erosion potential very low (55%) and low (7%). However, the screening report illustrates low - medium sensitive plant species within and around the application area (see Figure 39).

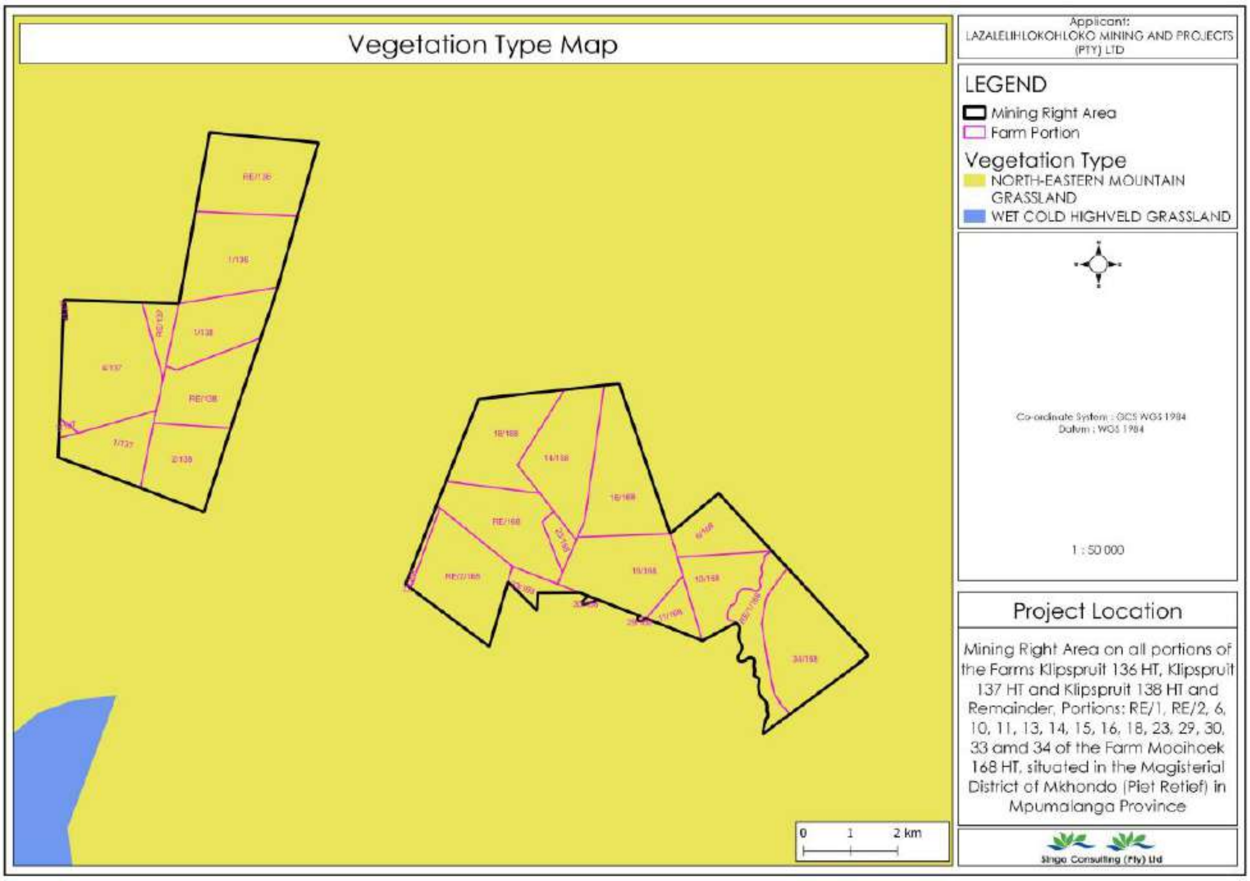

Figure 39: Proposed vegetation type of the proposed mining area. [Singo Consulting,2022].

Photo 3: common vegetation type on site. [Singo Consulting,2019].

7.5.9.1 Terrestrial threatened ecosystem

The South African National Biodiversity Institute (SANBI), in conjunction with the DEA, released a draft report in 2009 entitled *Threatened Ecosystems in South Africa: Descriptions and Maps*, to provide background information on the list of threatened ecosystems (SANBI, 2009). The purpose of this report was to present a detailed description of each of South Africa's ecosystems and to determine their status using a credible and practical set of criteria. The following criteria were used to determine the status of threatened ecosystems:

- Irreversible loss of natural habitat
- Ecosystem degradation and loss of integrity

- Limited extent and imminent threat
- Threatened plant species associations
- Threatened animal species associations
- Priority areas for meeting explicit biodiversity targets as defined in a systematic conservation plan

In terms of Section 52 (1) (a) of the NEM:BA, a new national list of ecosystems that are threatened and in need of protection was gazetted on 9 December 2012 (Government Notice 1002 (Driver et. al., 2004)). The list classified all threatened or protected ecosystems in South Africa in four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), or Protected. The purpose of categorising these ecosystems is to prioritise conservation areas in order to reduce the rates of ecosystem and species extinction, and prevent further degradation and loss of structure, function, and composition of these ecosystems. It is estimated that 9.5% of South African ecosystems are threatened, with CR and EN ecosystems accounting for 2.7%, and VU ecosystems 6.8% of the land area. It is vital that Threatened Terrestrial Ecosystems inform proactive and reactive conservation and planning tools, such as Biodiversity Sector Plans, municipal Strategic Environmental Assessments (SEAs), Environmental Management Frameworks (EMFs), EIAs and other environmental applications (Mucina et al., 2006).

Ecosystem threat status

Ecosystem threat status indicates the degree to which ecosystems (vegetation types) are still intact or, conversely, losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends. Based on the proportion of each ecosystem type that remains in a good ecological condition relative to a series of thresholds of ecosystem loss, ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT) (Skowno et al., 2019). According to the NBA spatial dataset, the project area traverses a VU ecosystem.

7.5.9.2 Methodology and reporting

The information provided in this Ecological Assessment report is based on the two-phased approach that was followed. Phase one entailed a desktop assessment which was completed to gather and assess all available literature and information for the study area. The desktop assessment informed the baseline desktop environment. The data obtained from this assessment augmented the field assessment. Upon the completion of a desktop assessment, a site sensitivity verification was undertaken to assess the status of biodiversity and give an actual indication of species present on site which was discussed in the context of communities within the ecosystem of the area as well as to determine whether further studies would be required.

7.5.9.2.1 Desktop assessment

A desktop review was carried out to identify features of ecological importance within the project area and the surrounding region, which may be impacted by the proposed Project. A regional understanding of the Project area was gained through this process which enabled a more accurate ecological assessment to be undertaken. Information collected during the desktop study included but is not limited to:

- The general vegetation of the region according to the National Vegetation Map of South Africa, Lesotho and Swaziland (Mucina and Rutheford,2012);
- Vegetation types and/or habitats;
- Potential species in the area (based on data for the quarter degree squares that include the project area) according to literature (previous reporting, available species lists for the proposed project area);
- Potential Red Data species and their current status; and
- Current species richness and ecosystem status.

7.5.9.2.2 Field assessment

A site visit was conducted on the **5th of May 2019**, during the wet season. The footprint areas of the proposed Mining Right Area (MRA) were inspected and sampled in the field. Where present, specific attention was paid to potentially sensitive features wetlands and rocky outcrops within or near the development footprint. All plant species present in or near the pipeline footprint areas were recorded and the presence and abundance of listed and protected species were also recorded where present. Sensitive features were mapped and characterised in the field where present.

7.5.9.2.3 Vegetation

The project area falls within the Savanna biome. This Biome is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It extends beyond the tropics to meet the Nama-Karoo Biome on the central plateau, the Grassland Biome at higher altitudes towards the east and extends down the eastern seaboard interior and valleys where it grades into Albany Thicket in the Eastern Cape. According to Mucina and Rutherford (2006) the proposed MRA falls within the grassland Biome within the North - Eastern Highveld Grassland vegetation type.

From the screening report generated in house, it is denoted that the proposed MRA sensitivity ranges from low to Medium. Refer to **figure 37** below.

Table 18: Sensitive plant species found in the Proposed MRA.

Scientific Name	Endemism	Provincial Distribution	Range	Major System	Major Habitats	Description
Indigofera hybrida	South African Endemic	Mpumalanga	Ermelo - Wakkerstroom	Terrestrial	KaNgwane Montane Grassland, Eastern Highveld Grassland	Dry, Highveld grassland
Bowkeria citrina	South African Endemic	KZN, Mpumalanga	Southern Mpumalanga and northern KwaZulu-Natal between Groenvlei, Wakkerstroom and Luneburg	Terrestrial	Wakkerstroom Montane Grassland, Paulpietersburg Moist Grassland, Eastern Highveld Grassland	Forest margins and cliff edges on cool slopes, 1400-1800 m
Melanospermum italae	Not endemic to South Africa	KZN, Mpumalanga	Louwsburg, Piet Retief and near Mbabane (Swaziland)	Terrestrial	Ithala Quartzite Sourveld, KaNgwane Montane Grassland	Mistbelt grassland, in sandy or gritty places around or on rock sheets and around extensive rock outcrops, 1200-1500 m

Gerbera aurantiaca	South African Endemic	KZN, Mpumalanga	KwaZulu-Natal Midlands, Carolina and Badplaas	Terrestrial	Midlands Mistbelt Grassland, Moist Coast Hinterland Grassland, Dry Coast Hinterland Grassland, Northern Zululand Mistbelt Grassland, KaNgwane Montane Grassland, Paulpietersburg Moist Grassland, Wakkerstroom Montane Grassland	Mistbelt grassland, well-drained doleritic areas.
Dracosciadium italae	South African Endemic	KZN, Mpumalanga	Hilltops in the Vryheid-Ngome district, northern KwaZulu-Natal and Wakkerstroom, southern Mpumalanga	Terrestrial	Northern Zululand Mistbelt Grassland, Paulpietersburg Moist Grassland, Wakkerstroom Montane Grassland	Montane and mistbelt grassland, on rock outcrops with dolerite soils, 1200-1600 m
Lotononis amajubica	South African Endemic	Free State, KZN, Mpumalanga	High mountain peaks of southern Mpumalanga, north-western	Terrestrial	Grassland	Well-drained, high altitude grassland, 1600-1800 m

			KwaZulu-Natal and eastern Free State			

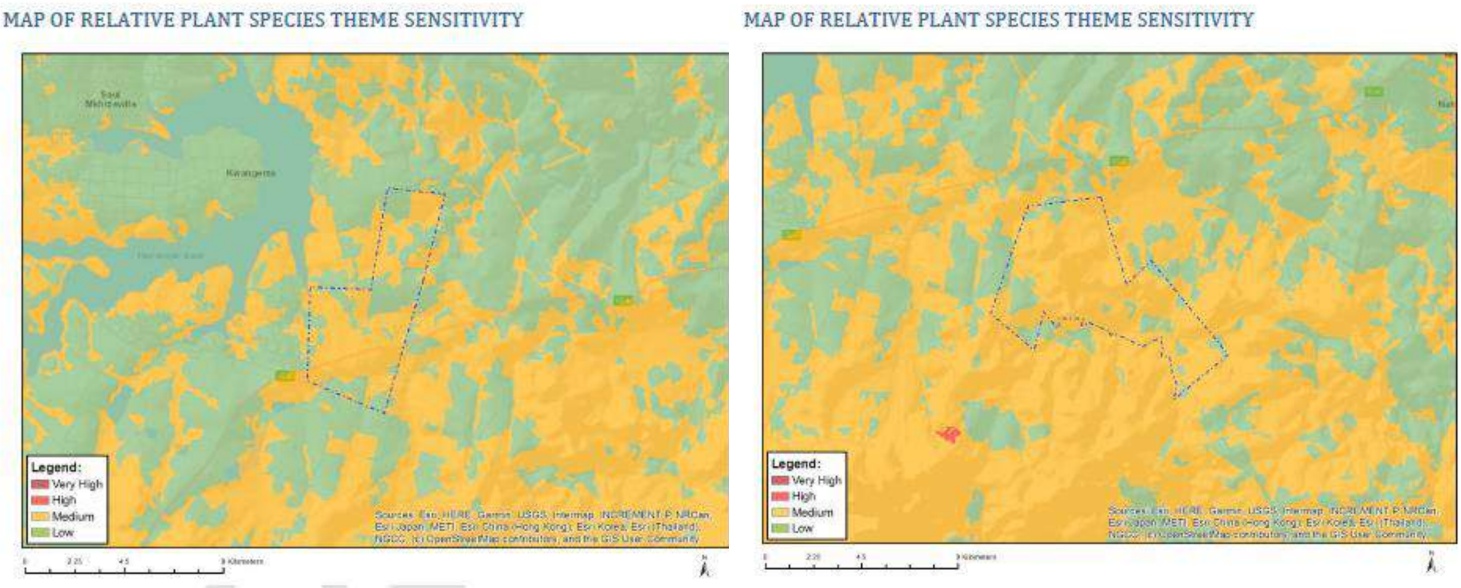

Figure 40: Maps of relative plant species theme sensitivity. [Screening Report].

7.5.9.2.4 Fauna survey

7.5.9.2.4.1 Mammals

According to the screening tools generated in house , the species listed in Table 19 were identified as being possible to occur within the study area. It must be noted that some of these species are very sensitive to habitat and in some instances; the likeliness for them to occur is minimal. Cattle and other domestic animals graze on the property.

Table 19: Fauna dominating the MRA

Scientific Name	Geographical Range	Habitat Regions	Terrestrial Biome	Wetlands	Other Physical features	Biogeographic Regions
Aves-Tyto capensis	wetlands of sub-equatorial Africa and High altitude of the Cameroon mountain.	Tropical, Terrestrial	Savanna or Grassland	Marsh	Endothermic, homoiothermic, bilateral symmetry	Ethiopian
Aves-Balearica regulorum	Uganda and Kenya to Northern Zimbabwe and Northern Mozambique. Angola, North Namibia and east through Botswana to Zimbabwe and South to South Africa.	Tropical, Terrestrial	Savanna or Grassland	Marsh	Endothermic, homoiothermic, bilateral symmetry	Ethiopian

Aves-Sagittarius serpentarius	Africa South of Sahara (except Namibia).	Tropical, Terrestrial	savanna or grassland scrub forest.		Endothermic, homoiothermic, bilateral symmetry	Ethiopian
Mammalia-Chrysospalax villosus	Eastern Cape, Kwazulu-Natal, Gauteng, and Mpumalanga	Temperate; Terrestrial	Savanna or Grassland		Endothermic, homoiothermic, bilateral symmetry	Ethiopian
Mammalia-Ourebia ourebi ourebi	Northern and Southern savanna, across Guinea Savanna to Ethiopia and south through western East Africa to Tanzania.		Savanna or Grassland; scrub forest		Endothermic, homoiothermic, bilateral symmetry	Ethiopian
Invertebrate-Clonia lalandei	Free State, KwaZulu-Natal and Mpumalanga Provinces	Terrestrial				

Invertebrate-Doratogonus praealtus						
Aves-Polemaetus bellicosus	Sub Saharan Africa	Tropical; Terrestrial	Savanna or Grassland; scrub forest		Endothermic, homoiothermic, bilateral symmetry	Ethiopian

(Source, Animal Diversity Web - AWD)

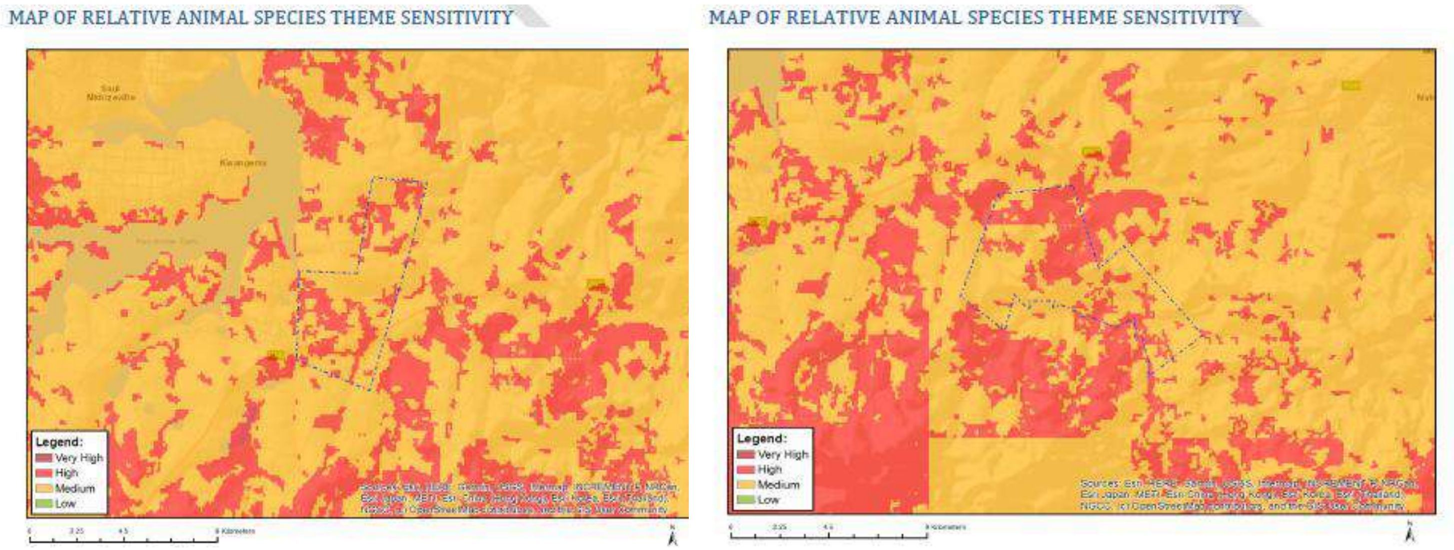

Figure 41: Maps of relative animal Species theme sensitivity.[Screening Report].

The site is also used for grazing by cattle, the study site has evidence of cow droppings (Figure 79). None of the sensitive mammals which were expected were spotted on site. The presence of evidence of disturbance on site, and the seasonality issues may explain why all the sensitive mammals were not seen during the site visit. Some of the expected animals are nocturnal, and thus may only be seen at night. The study site is located within a dam, which may attract a number of animals for drinking and feeding purposes.

7.6 Impact assessment methodology

The significance of the impacts will be assessed using the following impact assessment guideline:

Table 20: Impact assessment

Nature of the impact		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude		
Minor	2	Negligible effects on biophysical or social functions/processes. Includes areas/ environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).

Low	4	Minimal effects on biophysical or social functions/processes. Includes areas/environmental aspects which have been largely modified, and/or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions/processes. Includes areas/ environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions/processes. Includes areas/ environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions/processes. Includes areas/ environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Extent		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

The significance of the ecological impact is calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP=31-60) and Low (SP<30) significance (see Table 21).

Table 21: Definition of significance rating.

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision.
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

7.7 Assessment results

7.7.1 Flora

The study site is naturally characterised by Slightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition (Aristida, Digitaria, Eragrostis, Themeda, Tristachya etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (Acacia caffra, Celtis africana, Diospyros lycioides subsp lycioides, Parinari capensis, Protea caffra, P. welwitschii and Rhus magalismontanum). It is important to note that the site has been completely transformed by agricultural activities, with patches of Eucalyptus Trees. The vegetation is short dense grassland dominated by the usual highveld grass composition consisting of Aristida, Digitaria, Eragrostis, Themeda, Tristachya species on (A, B & C).

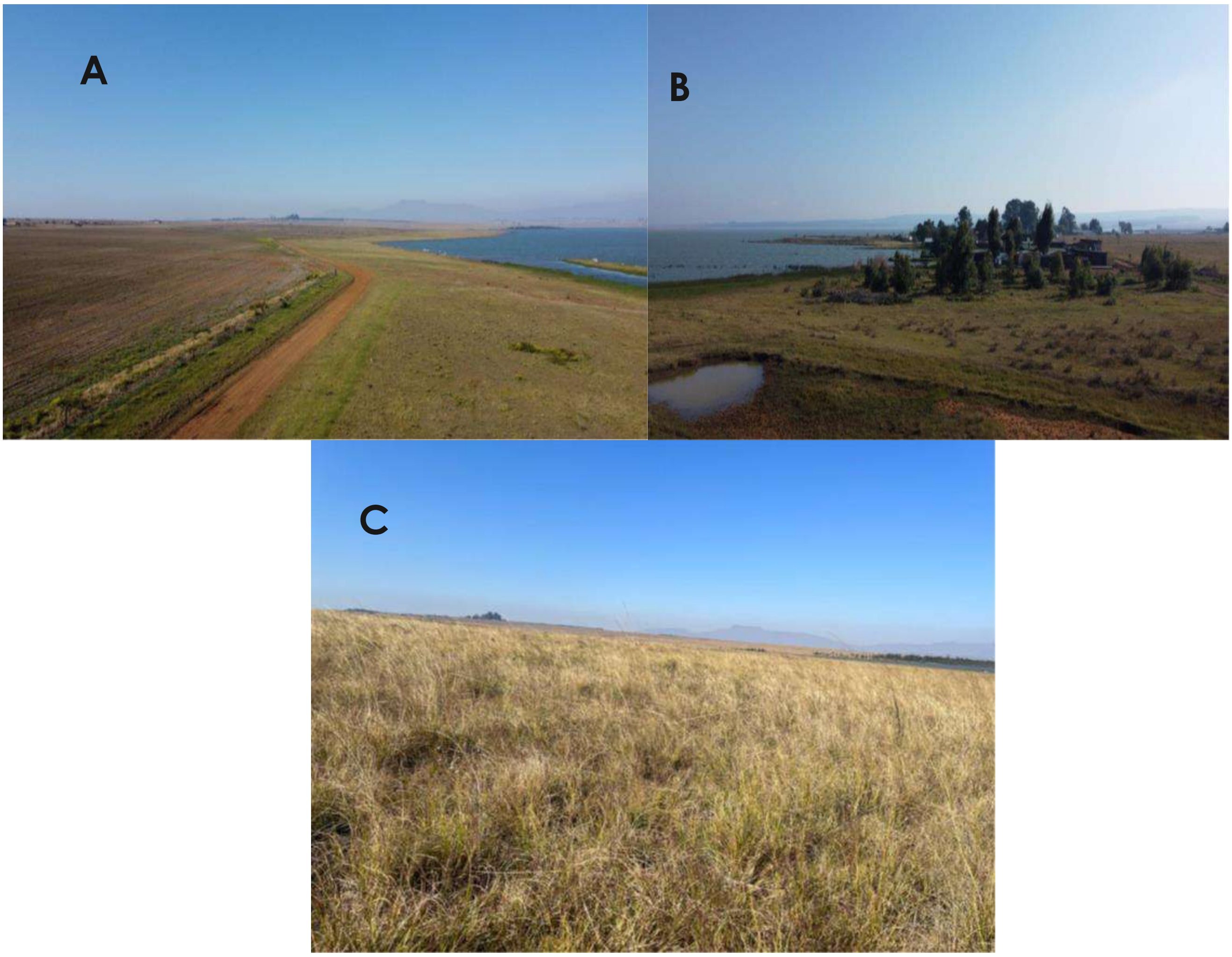

Figure 42: A-Overview of the disturbed lands with evidence of agricultural lands, B- Eucalyptus trees observed onsite, C- Natural vegetation observed onsite. (Nyamoki Consulting, 2022)

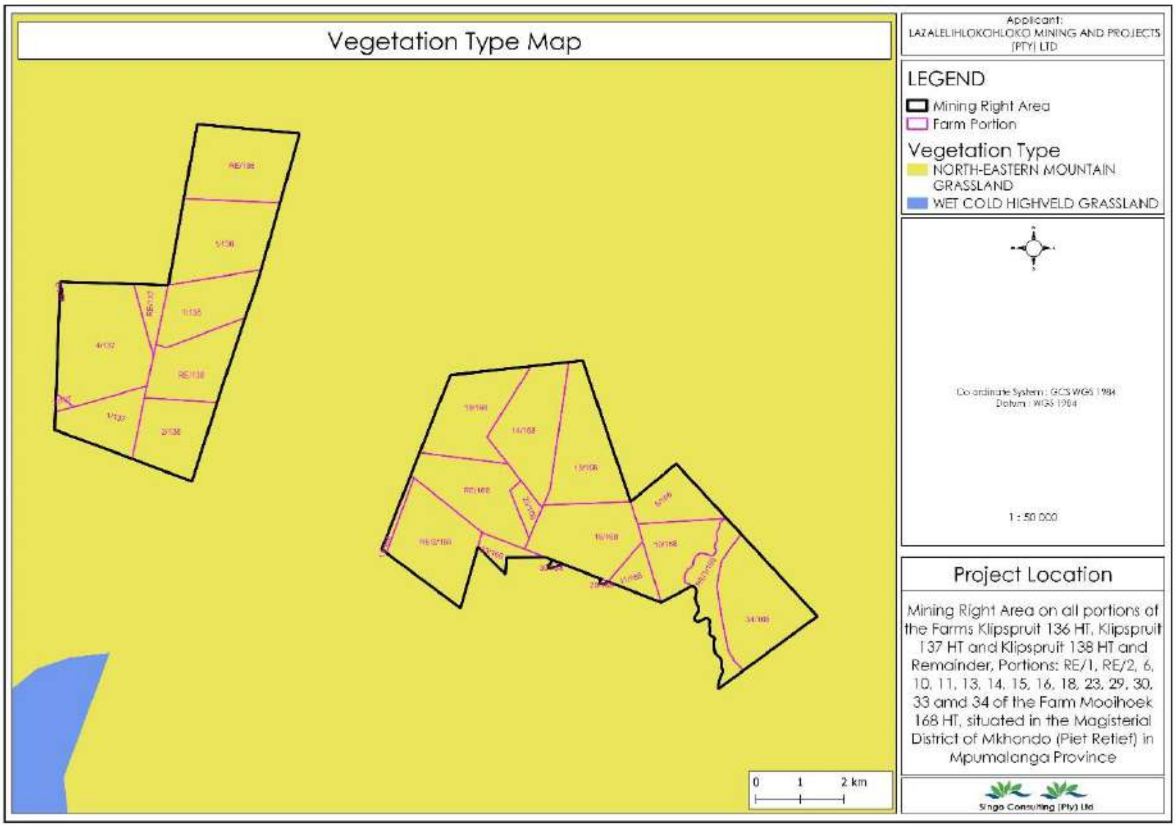

Figure 43: Type of on-site vegetation. [Singo Consulting,2022].

7.7.1.1 Description of the Critical Biodiversity Areas

Critical Biodiversity Areas (CBAs) have terrestrial and aquatic landscape features that are critical in retaining biodiversity and supporting continued ecosystem functioning and services (SANBI, 2007). These form the key output of a systematic conservation assessment and are the biodiversity sectors inputs into multi-sectoral planning and decision-making tools.

The primary purpose of CBAs is to inform land-use planning and the land-use guidelines attached to CBAs' aim to promote sustainable development by avoiding loss or degradation of important natural habitat and landscapes in these areas and the landscape as a whole. CBAs can be used to inform protected area expansion and development plans. The use of CBAs here follows the definition laid out in the guideline for publishing bioregional plans (Anon, 2008):

- "Critical biodiversity areas (CBAs) are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses. "
- "Ecological support areas (ESAs) are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that

support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas."

According to the Mpumalanga conservation plan, the majority of the site is located in a heavily modified area, since cultivation is taking place on-site with the remainder of the site classified as other natural areas (ONA). Moderately or Heavily Modified Areas (sometimes called 'transformed' areas) can be described as areas that have been heavily modified by human activity so that they are by-and-large no longer natural, and do not contribute to biodiversity targets (MTPA, 2014). Some of these areas may still provide limited biodiversity and ecological infrastructural functions but, their biodiversity value has been significantly, and in many cases irreversibly, compromised. ONAs consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (SANBI-BGIS, 2017).

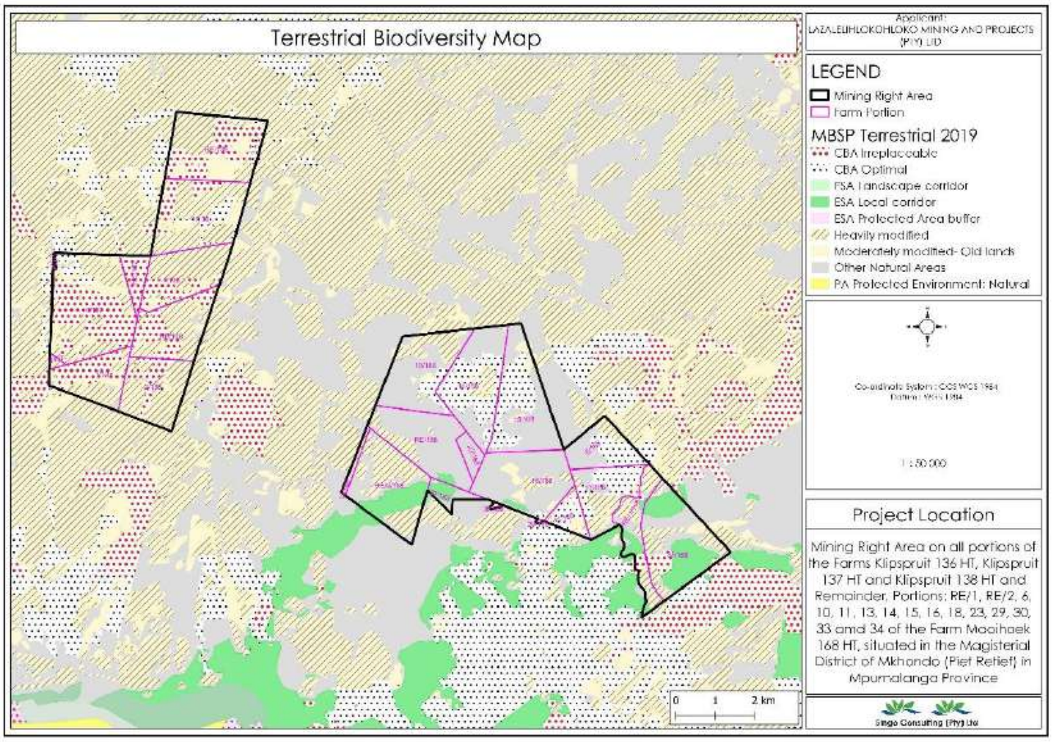

Figure 44: Biodiversity maps of the proposed project areas.[Singo Consulting,2022].

The proposed MRA is entirely covered with high terrestrial biodiversity theme sensitivity as depicted in **figure 42** below. Sensitivity features include CBA 1,CBA 2, Protected Areas Expansion Strategy, Strategic water source area, vulnerable ecosystem, ESA: local corridor and endangered ecosystem.

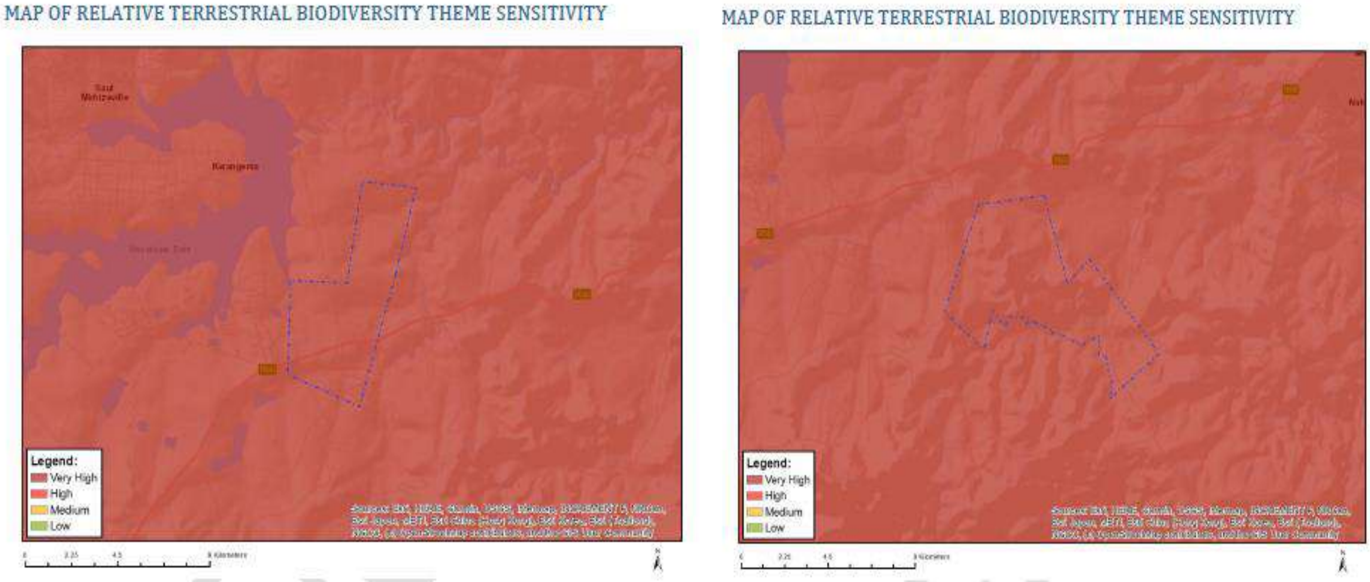

Figure 45: Maps of relative terrestrial biodiversity theme sensitivity.[Screening Report,2022].

7.7.1.2 Mammals

This faunal survey focused mainly on the mammals and birds of the study area. The survey focused on the current status of threatened animal species occurring, or likely to occur in the study area, describing the available and sensitive habitats. Names of the mammal species that were recorded include the Geronticus calvus , Tyto capensis, Mammalia-Ourebia ourebi ourebi and Boophone disticha . Cows were also observed within the project area during assessment. Hunting and killing of mammals observed on site is therefore strictly prohibited at all times for the lifetime of the proposed mining project.

Table 22: Mammal bird list species of the proposed MRA.

Species Status Report

Tuesday, October 25, 2022

Resolution <=100; Map Grid=2730BA; Databse=All

2730BA

Common Name	Scientific Name	Conservation RSA	MTPA	Endemic
Birds				
DONKERHOEK 172 HT				
Secretarybird	Sagittarius serpentarius	VU	VU	
Yellow-breasted Pipit	Anthus chloris	VU	VU	RSA
DRIE HOEK 174 HT				
Yellow-breasted Pipit	Anthus chloris	VU	VU	RSA
GROOTHOEK 171 HT				
Secretarybird	Sagittarius serpentarius	VU	VU	
Southern Bald Ibis	Geronticus calvus	VU	VU	RSA
Yellow-breasted Pipit	Anthus chloris	VU	VU	RSA
KLIPSPRUIT 135 HT				
Southern Bald Ibis	Geronticus calvus	VU	VU	RSA
MOOIHOEK 168 HT				
African Grass-Owl	Tyto capensis	VU	VU	
ROOI KRAAL 173 HT				
Blue Crane	Anthropoides paradiseus	NT	VU	
Blue Crane	Anthropoides paradiseus	NT	VU	
Grey Crowned Crane	Balearica regulorum	EN	EN	
Yellow-breasted Pipit	Anthus chloris	VU	VU	RSA
TAFELBERG 186 HT				
Grey Crowned Crane	Balearica regulorum	EN	EN	
WEEBER 147 HT				
Blue Crane	Anthropoides paradiseus	NT	VU	
ZANDKRAAL 99 HT				
Secretarybird	Sagittarius serpentarius	VU	VU	
Fish				
ANNYS SPRUIT 141 HT				
BANO	Enteromius anoplus - Escarpment form	EN/CR	EN	RSA
BPBR	Barbus brevipinnus - Usutu form		EN	MP
CEMA	Chiloglanis emarginatus	LC	NT	
ANNYSSPRUIT 139 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
ANNYSSPRUIT 142 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
ANNYSSPRUIT 145 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
ASSEGAI 143 HT				

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CEMA	Chiloglanis emarginatus	LC	NT	
DONKERHOEK 172 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
DRIE HOEK 174 HT				
BARG	Barbus argenteus		?? Johan recommend	
VNEL	Labeobarbus nelspruitensis	NT	NT	RSA
GOEDE HOOP 169 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
GOEDE TROUW 144 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
GROOTHOEK 171 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
KLIPSPRUIT 502 IT				
CEMA	Chiloglanis emarginatus	LC	NT	
MOOIHOEK 168 HT				
BANO	Enteromius anoplus - Escarpment form	EN/CR	EN	RSA
CEMA	Chiloglanis emarginatus	LC	NT	
OOGIE 146 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
ROOI KRAAL 173 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
SUSANSKROON 177 HT				
CEMA	Chiloglanis emarginatus	LC	NT	
UITGEVALLEN 175 HT				
BARG	Barbus argenteus		?? Johan recommend	
VNEL	Labeobarbus nelspruitensis	NT	NT	RSA
WEEBER 147 HT				
BANO	Enteromius anoplus - Escarpment form	EN/CR	EN	RSA
BPBR	Barbus brevipinnus - Usutu form		EN	MP
CEMA	Chiloglanis emarginatus	LC	NT	
ZAAIHOEK 188 HT				
BARG	Barbus argenteus		?? Johan recommend	
CEMA	Chiloglanis emarginatus	LC	NT	
VNEL	Labeobarbus nelspruitensis	NT	NT	RSA
Invertebrates				
GROOTHOEK 171 HT				
Aloeides merces	Aloeides merces	LC	Rare	Endemic
LANGGEWACHT 170 HT				
Aloeides merces	Aloeides merces	LC	Rare	Endemic
Amphibians				
Strongylopus wageri	Strongylopus wageri	NT	VU	RSA
Kwaaiboervlei, small stream with vlei and channels, cattle				
Strongylopus wageri	Strongylopus wageri	NT	VU	RSA
Vlei and flooded veld, important site for Strongylopus				

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Strongylopus wageri	Strongylopus wageri	NT	VU	RSA
Large Mammals				
BODENSTADT 164 HT				
Orycteropus afer	Aardvark	LC	LC	
Ourebia ourebi ourebi	Oribi	EN	EN	
DONKERHOEK 172 HT				
Orycteropus afer	Aardvark	LC	LC	
MOOIHOEK 168 HT				
Ourebia ourebi ourebi	Oribi	EN	EN	
ROOI KRAAL 173 HT				
Orycteropus afer	Aardvark	LC	LC	
Ourebia ourebi ourebi	Oribi	EN	EN	
Plants				
DONKERHOEK 172 HT				
Aloe kniphofioides	Aloe kniphofioides	VU	VU	FSA
Dracoscladium italae	Dracoscladium italae	VU	VU	SA
Drimia altissima (=Urginea altissima)	Drimia altissima (=Urginea altissima)	Declining	Declining	
Eucomis autumnalis	Eucomis autumnalis	Declining	Declining	FSA
Merwilla plumbea (=Scilla natalensis)	Merwilla plumbea (=Scilla natalensis)	NT	NT	FSA
GOEDE HOOP 169 HT				
Dracoscladium italae	Dracoscladium italae	VU	VU	SA
GOEDE TROUW 144 HT				
Aloe kniphofioides	Aloe kniphofioides	VU	VU	FSA
GROOTHOEK 171 HT				
Aloe hlangapies	Aloe hlangapies		NT	SA
Aloe kniphofioides	Aloe kniphofioides	VU	VU	FSA
Drimia altissima (=Urginea altissima)	Drimia altissima (=Urginea altissima)	Declining	Declining	
Gladiolus appendiculatus (Wakkerstroom form)	Gladiolus appendiculatus (Wakkerstroom form)		VU	SA
Gunnera perpensa	Gunnera perpensa	Declining	Declining	NOT
Lobelia trullifolia subsp. delicatula	Lobelia trullifolia subsp. delicatula	Rare	Rare	FSA
Lotononis amajubica	Lotononis amajubica	Rare	Rare	SA
Protea parvula	Protea parvula	NT	NT	FSA
Watsonia latifolia	Watsonia latifolia	LC	Rare	FSA
KLIPSPRUIT 137 HT				
Gerbera aurantiaca	Gerbera aurantiaca	EN	EN	SA
MOOIHOEK 168 HT				
Boophone disticha	Boophone disticha	LC	LC	NOT
Eucomis autumnalis	Eucomis autumnalis	Declining	Declining	FSA
Watsonia latifolia	Watsonia latifolia	LC	Rare	FSA
MOOIHOEK 68 HT				
Melanospermum italae	Melanospermum italae	VU	VU	FSA
PAARDEPLAATS 101 HT				
Aloe kniphofioides	Aloe kniphofioides	VU	VU	FSA
PLATJESFONTEIN 76 HT				

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Gunnera perpensa	Gunnera perpensa	Declining	Declining	NOT
Merwilla plumbea (=Scilla natalensis)	Merwilla plumbea (=Scilla natalensis)	NT	NT	FSA
ROODEWAL 190 HT				
Aloe kniphofioides	Aloe kniphofioides	VU	VU	FSA
TAFELBERG 186 HT				
Gunnera perpensa	Gunnera perpensa	Declining	Declining	NOT
UITGEVALLEN 175 HT				
Watsonia latifolia	Watsonia latifolia	LC	Rare	FSA
Watsonia latifolia	Watsonia latifolia	LC	Rare	FSA
UITGEVALLEN 228 HT				
Watsonia latifolia	Watsonia latifolia	LC	Rare	FSA

7.7.1.3 Soils, land use and land capability

The project falls under soil type or association with freely drained, structureless soils in the soil classification map. The Freely drained, structureless soils can be defined based on their soil depth, Soil Drainage, erodibility, and natural fertility. The dominating land-use on-site is Plantation (A), Natural vegetation(B) , Built up/homestead (C),Wetland and Wetlands on site will be buffered to limit and/or avoid physical mining over these areas.

Land capability is divided into three categories: arable and grazing. The potentialities and limitations of arable soils for sustained production of typical farmed crops that do not require specialist site conditioning or site treatment are classified in this categorization. Nonarable soils (soils that cannot be used for cultivated crops over an extended period of time) are classified according to their potential and limitations for sustained production of the common cultivated crops that do not require specialized site conditioning or site treatment. Nonarable soils (soils unsuited for long-term sustained cultivation of cultivated crops) are classified based on their ability to generate permanent vegetation and the risk of soil damage if improperly managed. The projected area's land capability is designated as arable land. Any ground that can be ploughed and utilized to raise crops is referred to as arable land. See land capability map on **Figure 49** below.

Figure 46: On-site land uses.[Singo Consulting,2019].

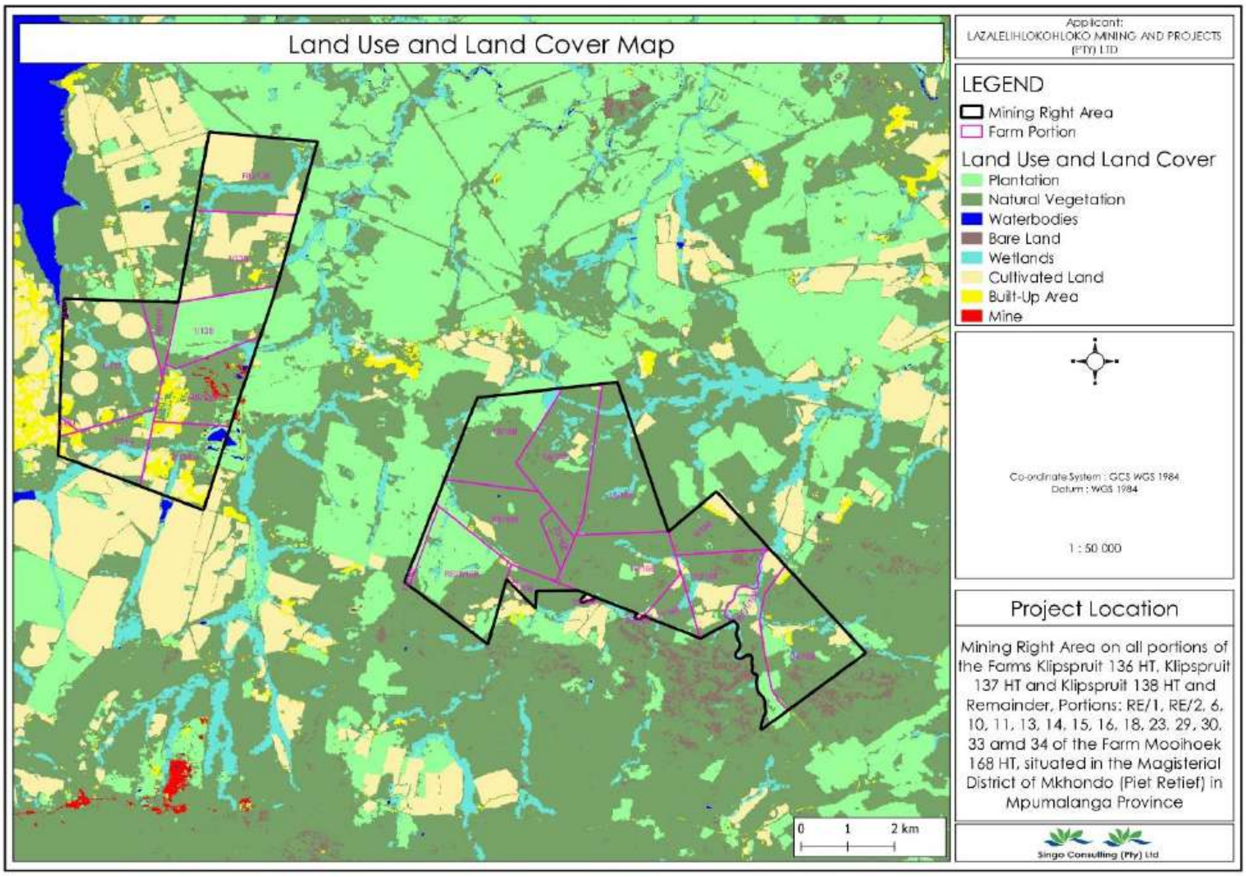


Figure 47: Land use and land cover map of the proposed MRA.[Singo Consulting,2022].

Figure 48: Land capability of the proposed MRA.[Singo Consulting, 2019].

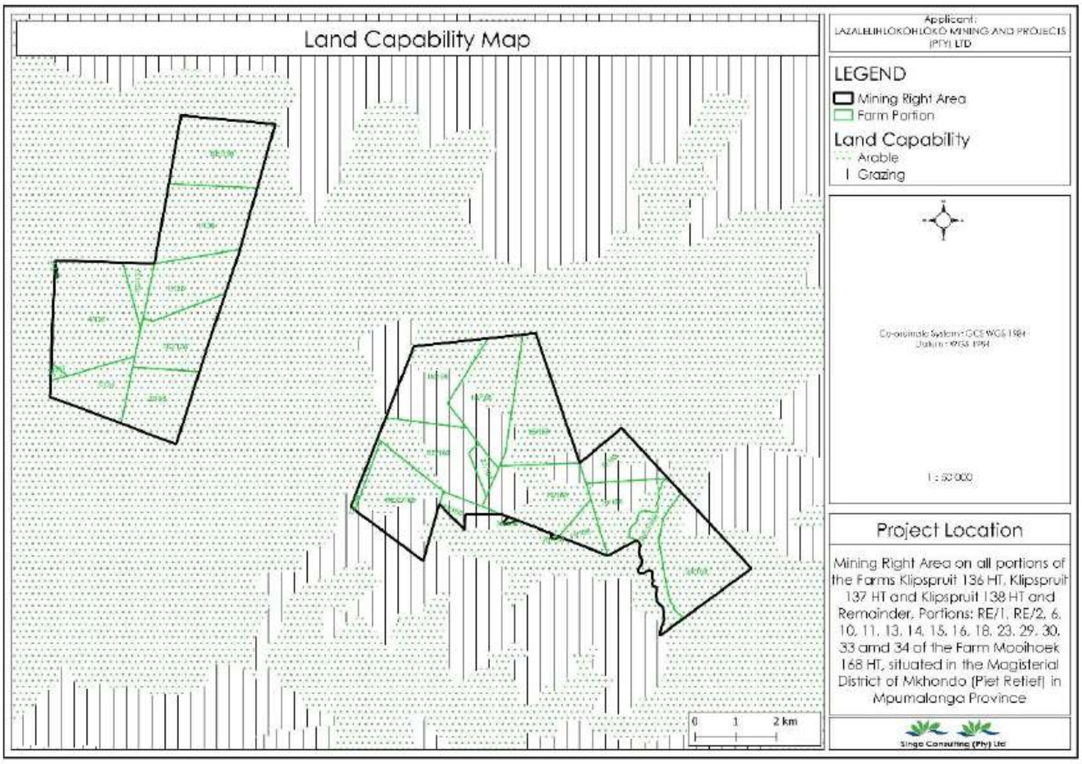


Figure 49: Land capability map of the project area. [Singo Consulting,2022].

8 HERITAGE STUDY

8.1 Historical background

Singo Consulting appointed heritage specialist (Integrated Specialist Services (pty) Ltd) to conduct a heritage impact assessment (HIA) for farm Mooihoek 168 HT, Klipspruit 136 HT , Klipspruit 137 & Klipspruit 138. The This Archaeology and Heritage Impact Assessment (AIA/HIA) is in fulfilment of Section 38 (8) of the National Heritage Resources Act 25 of 1999 (NHRA). Two burial site were observed on site during the ground truthing as shown in **Figure 50**.Heritage Impacted Assessment was uploaded on the SAHRA online portal.

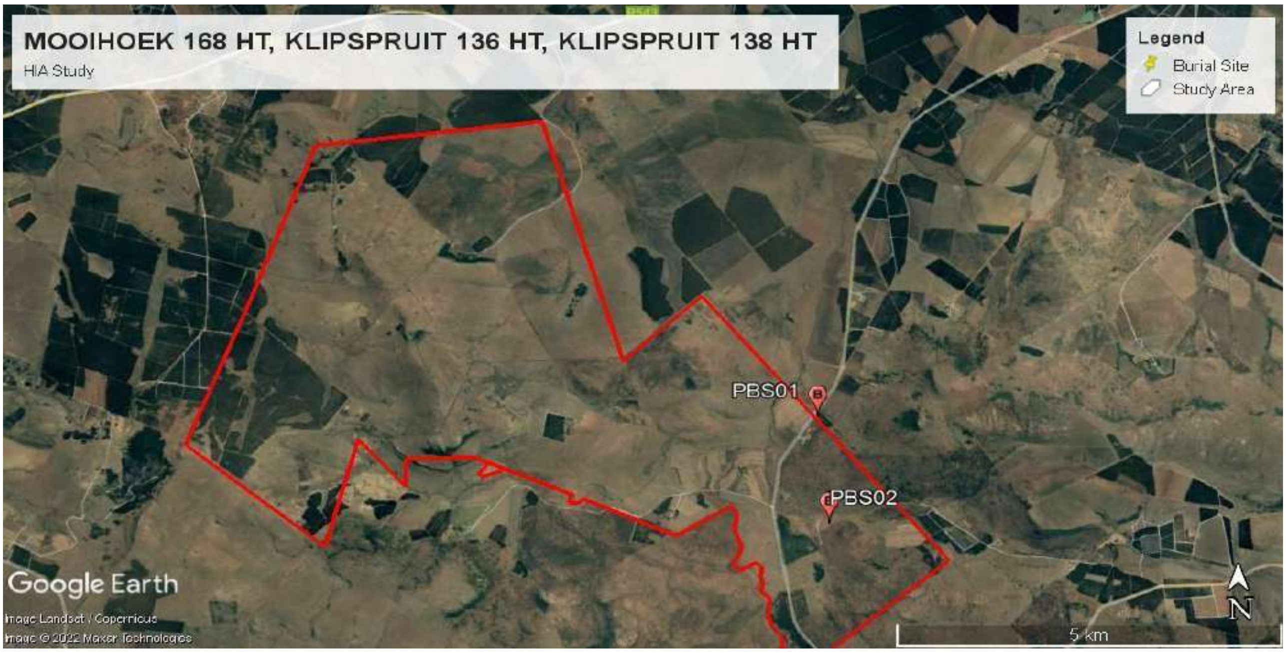


Figure 50: Recorded burial sites within the proposed prospecting site (ISS (Pty) Ltd 2022).

Figure 51: Burial site within the proposed coal mining site.

8.2 SAHRIS database and impact assessment reports in the proposed project area

Several archaeological and heritage studies were conducted in the project area due to a number of applications and these presents the nature and heritage character of the area. The HIA conducted in the area also provide some predictive evidence regarding the types and ranges of heritage resources to be expected in the proposed project area: (see reference list for HIA reports). Several previous Cultural Resource Management projects were conducted in the study area. The studies include residential, powerlines, substations and. The findings by various specialist studies provide an insight into the heritage character of the study area.

8.3 Intangible heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts and cultural spaces associated with group(s) of people. Thus, intangible heritage is better defined and understood by the particular group of people that uphold it. In the present study area, very little intangible heritage remains because no historically known groups occupied the study area and most of the original settler descendants moved away from the area.

8.4 Results of the field study

The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position.

The severe impacts are likely to occur during clearance at the proposed mining development site; indirect impacts may occur during movement of mining and construction vehicles and machinery. The excavation for foundations and fence line posts will result in the relocation or destruction of all existing surface heritage material. Similarly, the clearing of access roads will impact material that lies buried below the surface. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to any mining activities at the site. It is important to note, that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is very low within the proposed mine site.

Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during mining, construction of site offices, clearance of the site and actual mining. The purpose of the AIA is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of the proposed development by means of mitigation measures (see appended Chance Find Procedure). The study concludes that the impacts will be negligible since the site did not yield any confirmable archaeological remains. The following section presents results of the archaeological and heritage survey conducted within the proposed development project site.

8.4.1 Archaeological heritage sites

The site was scanned for archaeological remains, but given the previous and current land use activities, no archaeological remains were identified during the survey. Based on the field study results and field observations, the receiving environment for the proposed mining site is low to medium potential to yield previously unidentified archaeological sites during mining. Literature review also revealed that no Stone Age and LIA sites are not shown on a map contained in a historical atlas of this area. This, however, should rather be seen as a lack of research in the area and not as an indication that such features do not occur.

Human remains and burials are commonly found close to archaeological sites and abandoned settlements; they may be found in abandoned and neglected burial sites or occur sporadically anywhere because of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human burials on the landscape as these burials, in most cases, are not marked at the surface and concealed by dense vegetation cover. Human remains are usually identified when they are exposed through erosion, earth moving activities and construction. In some instances, packed stones or bricks may indicate the presence of informal burials. If any human bones are found during the course of mining work, then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial, they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500) or Department of Health for graves younger than 60 years.

The field survey identified two informal burial sites within the proposed mining right site. The graves are marked by oval shaped stone piles with distinctive headstones. The graves are arranged in rows. The study noted that there are several farm dwellings within the proposed mining site. These farm dwellings are for the previous labour tenants and current farm workers. On the other sections there are recently established homesteads doted within the mining right application site. Based on the field findings, this means that there is potential of informal graves occurring near these isolated farmworker dwellings. The practical solution is to request landowners and residents to declare their family graves located in the mining right site during public participation. It is conceded that some of the farmworker dwellings and farmhouses will be directly affected by the proposed mining and residents may have to be relocated. In the same vein graves associated with these farm dwellings will be affected and therefore need to be documented by a professional archaeologist before mining commences. It should be noted that burial grounds and gravesites. are accorded the highest social significance threshold (see The attached HIA on Appendix 8). They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with without a permit from SAHRA. It should also be borne in mind that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. The possibility of encountering previously unidentified burial sites is medium to high within the proposed mining site, however, should such sites be identified during mining, they are still protected by applicable legislations, and they should be safeguarded.

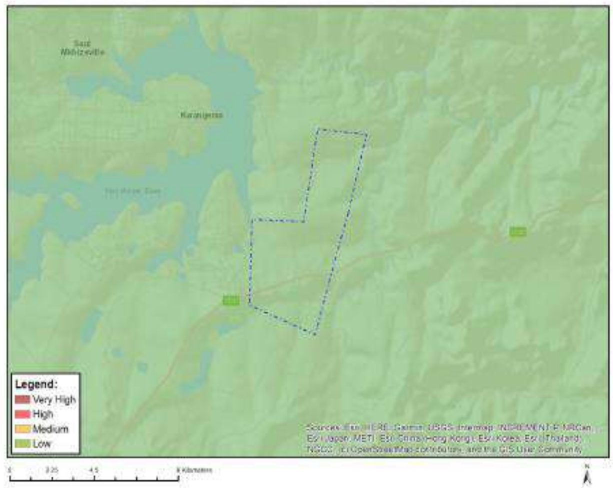
8.4.2 Buildings and structures older than sixty years

In terms of built environment, there are no buildings at the site. Therefore, in terms of Section 34 of the NHRA, the Mining Right Application may be approved without any further investigation and mitigation. The HIA full specialist assessment was conducted and it is attached on **Appendix 8**.

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Figure 52: Maps of relative archaeological and Cultural heritage theme sensitivity. [Screening Report, 2022]

Recommendations:

- It is recommended that SAHRA endorse the report as having satisfied the requirements of Section 38 (8) of the NHRA requirements
- The planners of the mine layout plans must provide for 100m buffer zones from the recorded burial sites
- Given the nature of the study area, a walk down survey must be done by a professional archaeologist once the layout plans for the mine are finalised. This is to ensure that significant heritage resources are identified within the mine footprint.
- The public participation process must request landowners and residents to declare graves located within their properties and residences since it was not practical to visit households during the survey
- From a heritage perspective supported by the findings of this study, the Mining Right Application is supported. However, the Mining Right Application should be approved under observation that mining does not extend beyond the area considered in this report/affect the identified heritage sites.
- Should chance archaeological materials or human remains be exposed during mining on any section of the site, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations.

- Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no significant cultural heritage resources barriers to the proposed Mining Right Application. The Heritage authority may approve the Mining Right Application as planned with special commendations to implement the recommendations here in made.

9.1 Population and development analysis/socio-economic analysis

According to stats SA (2016 community survey) Mkhondo municipality's population has grown from 75 452 to 84 151 in 5 years. This recorded a growth rate of 2.5%per annum between 2011 and 2016. It is estimated that by 2030 the population will have grown to 118 903 (see **Figure 53**). This increase in population is possibly the result of people migrating into the municipal area in search of jobs.

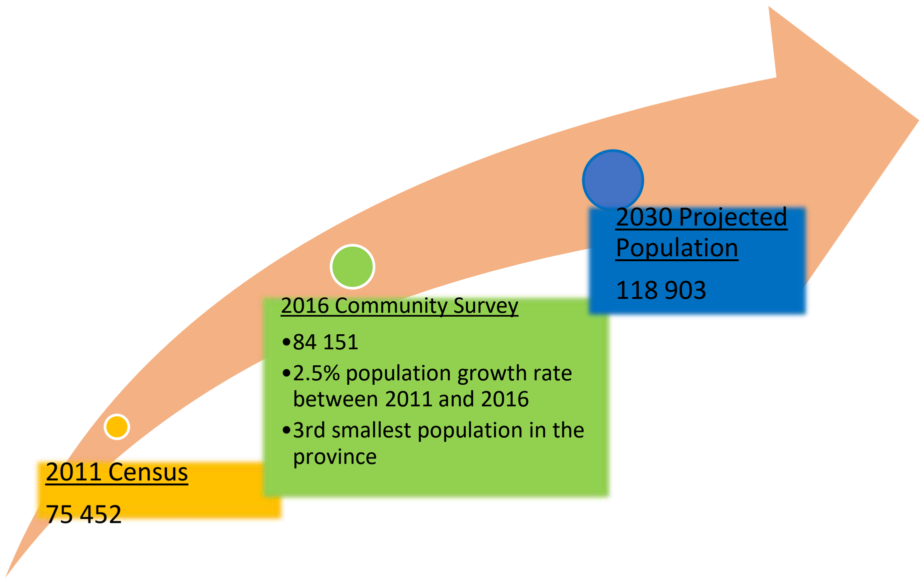
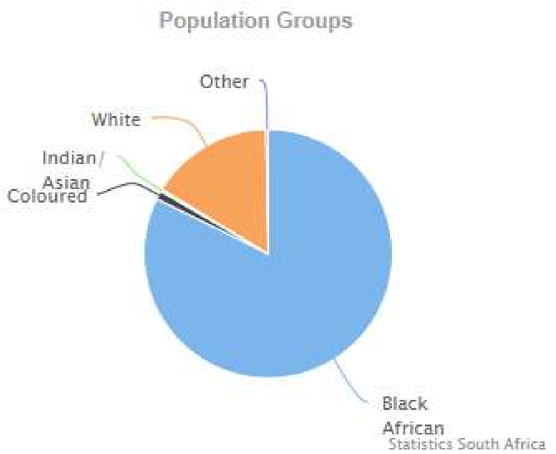


Figure 53: Population data and projections of Mkhondo (Source: Mkhondo Draft IDP 2020/21)



Group	Percentage
Black African	82,3%
Coloured	1,1%
Indian/Asian	0,3%
White	16%
Other	0,3%

Figure 54: Population by race (Source: Stats SA Census)

Mkhondo is composed of all racial groups with the majority being Black Africans which record 82.3% followed by White 16%; Coloured 1.1%; Indian or Asian 0.3%.

9.2 Economy and employment

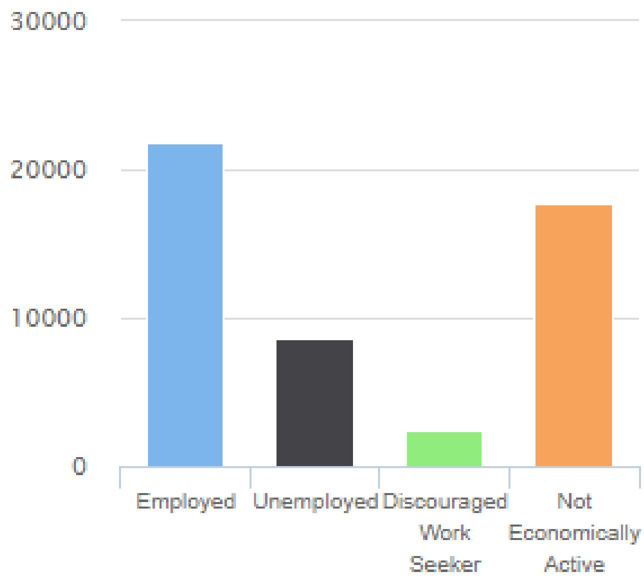


Figure 55: Employment status for working age 15 – 64 (Source: EML 2018 – 2019 Final IDP)

According to the IDP, the income level per household is considered a better barometer of poverty and reflects that 42% can be classified as Indigent as they earn less than R1,600 per month, as per Stats SA 2016. Not all these households have registered to qualify for access to free basic services as provided in the Indigent Policy guidelines. This issue is currently being progressed by the municipal administration.

There is a negative trend developing as more households are reportedly below the poverty line. The average household income level in the Mkhondo Local Municipality areas is reflected as R80 239 per annum, ranking it 9th with respect the overall province statistics standing (Source: Mkhondo Draft IDP 2020/21).

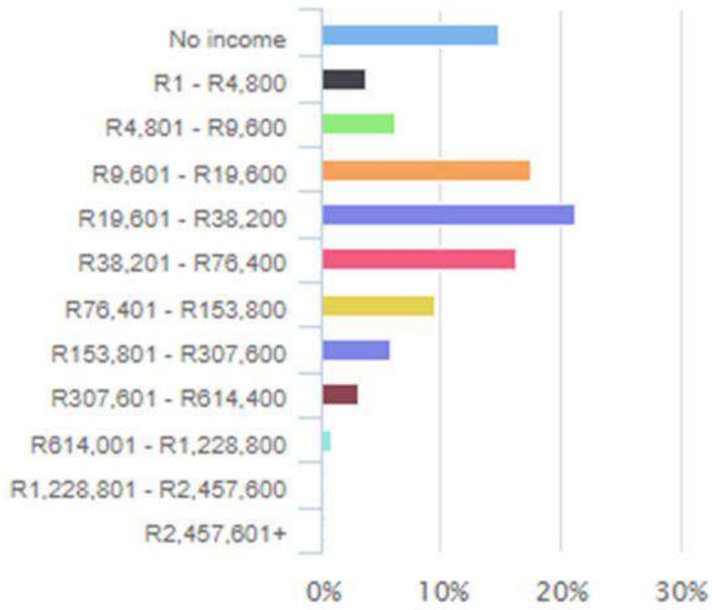


Figure 56: Household Income (Source: Mkhondo Draft IDP 2020/21)

Lazalelihlokohloko Mining and Projects (Pty) Ltd can assist the municipal area in ensuring socio-economic growth via the mining sector.

9.3 Types of living spaces

According to the Stats SA Census, there are 79.3% formal dwellings in the municipality, with an average household size of 3,6 persons per household.

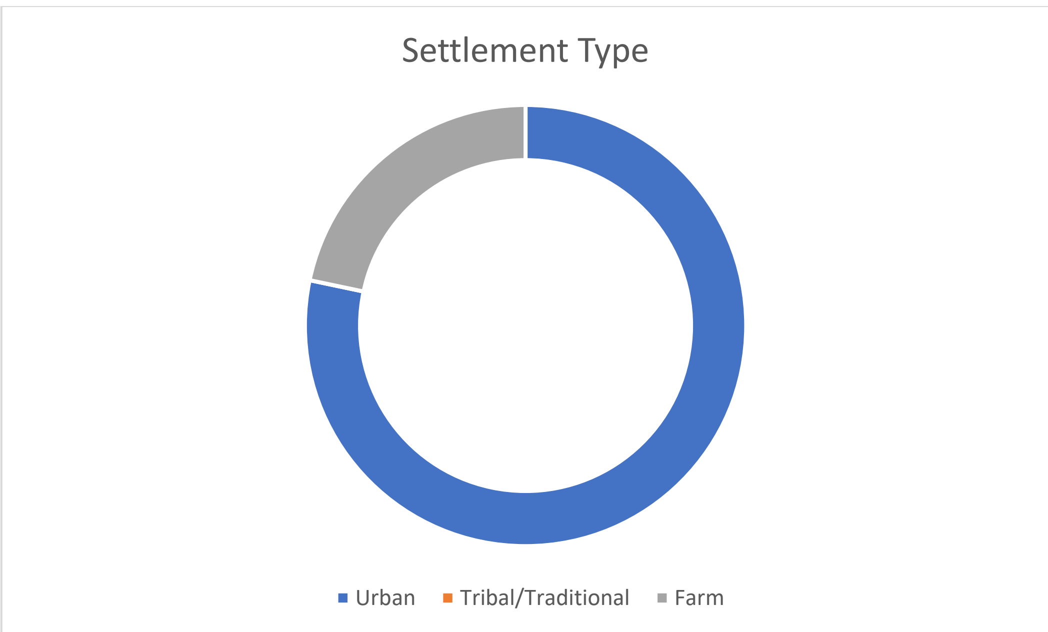


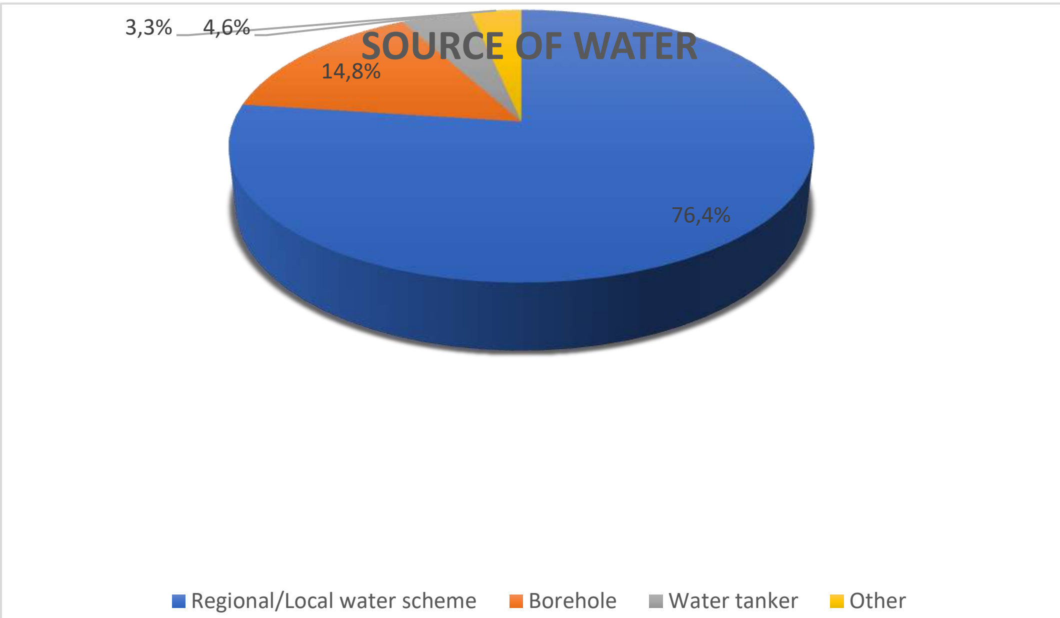
Figure 57: Types of Dwelling (Source: Stats SA Census)

The proposed project area has residential Land Use Rights, thus an application for rezoning to a mining land use has been lodged. We are in the process of this application.

9.4 Basic service delivery

A sizeable number of the households in the municipality have access to basic services like water, electricity, sanitation and refuse removal.

All stands in the Mkhondo Local Municipality, excluding those in the Dirkiesdorp areas (which piped potable water), are connected to a water-borne sanitation system. The water and sanitation services are therefore very closely linked to one another. Those stands that are not connected to the water-borne sanitation system use septic tanks (Mkhondo Draft IDP 2020/21).



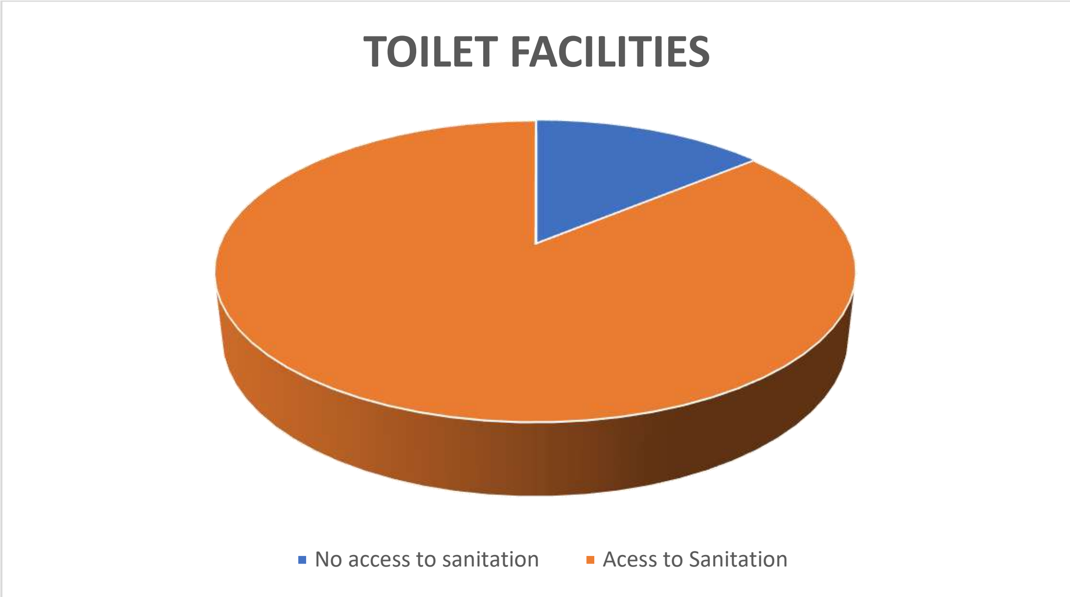


Figure 58: Toilet facilities within MLM (Source: Stats SA Census)

9.4.1 Electricity

The municipality has numerous houses that use electricity for lighting purposes. It is recorded in the municipal IDP that there is still a backlog of at least 1946 households without electricity.

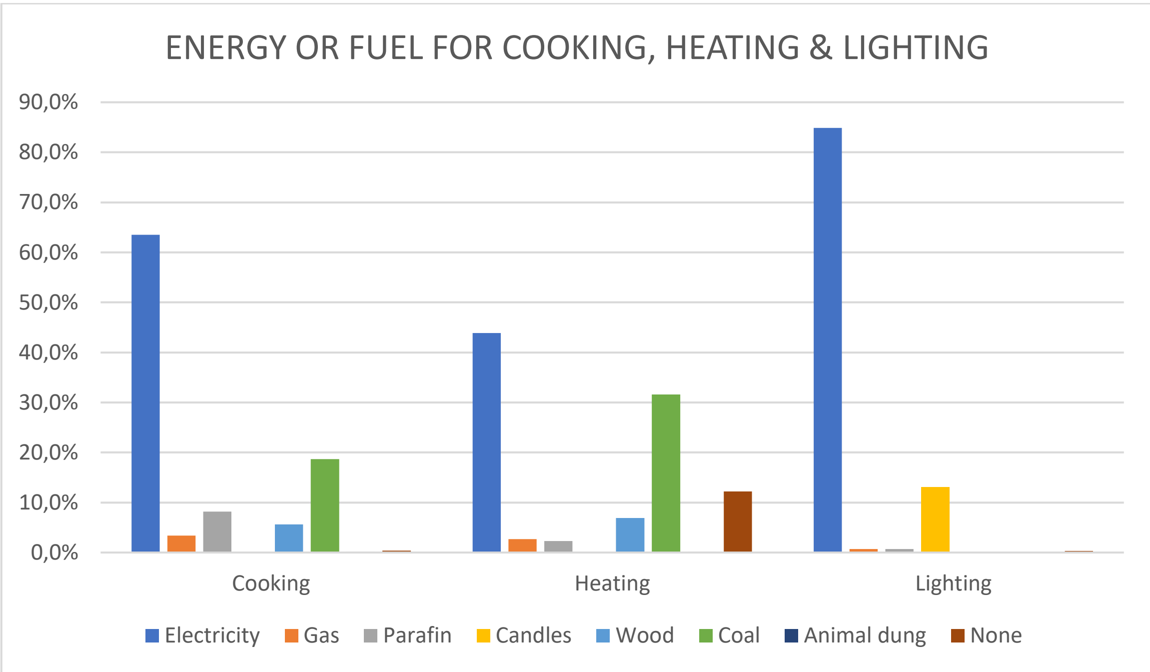


Figure 59: Percentage of Households with access to electricity (Source: Stats SA Census),

9.4.2 Waste management

According to the municipal IDP, MLM faces a challenge with waste removal due to the roads in Kwa Ngema being completely accessible during the rainy season thus additional refuse trucks will be needed in the not too distant future.

Table 23: Percentage of refuse removal.

Refuse removal	Percentage
Removed by local authority/private company at least once a week	73.7%
Removed by local authority/private company less often	2%
Communal refuse dump	1.6%
Own refuse dump	18.5%
No rubbish disposal	3.5%
Other	0.7%

Source: Stas SA Census and CS 2016.

9.4.3 Education

Educational attainment is a key indicator of development in a population. To evaluate long term provision of education, it is important to disaggregate educational attainment for persons older than 20 years. This is an ideal group since they would have completed attending educational institutions. Statistics South Africa generated a measure of educational attainment for persons over age 20. This group is expected to have completed educational enrolment and therefore giving a good measure for completed level of education.

According to the 2016 CS of Stats SA, the Mkhondo Local Municipality has an inherited problem namely that the low-income levels per household in the community correlate to the low education levels in the area.

The 2016 Survey shows that 25% of the population above 15 years of age has had no schooling or did not complete primary school. Of this number 5,528 are basically illiterate and therefore future meaningful employment prospects are virtually impossible.

A further 41% of the population did not complete the schooling curriculum and therefore did not reach the level of matric (Mkhondo Draft IDP 2020/21).

Of those aged 20 years and older, 6.5% have completed primary school, 32.8% have some secondary education, only 12.9% have completed matric,1.3% have some form of higher education, while 4.1% have no form of schooling. (Stats SA Census).

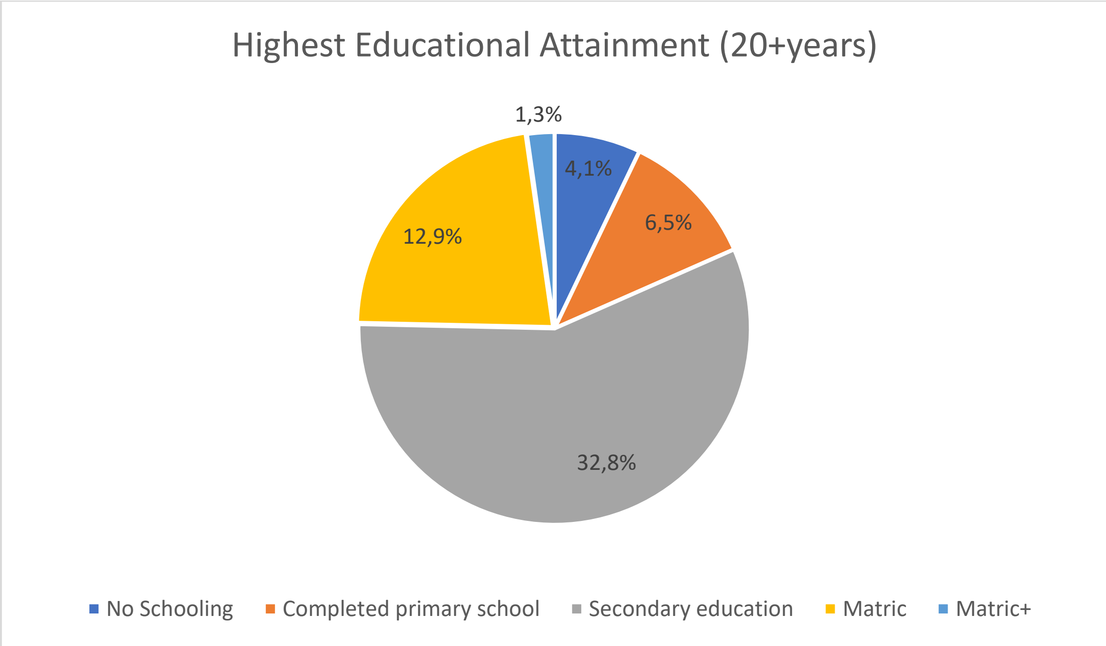


Figure 60: Age 20+ Educational Attainment (Source based on: Stats SA Census).

9.5 Health status

9.5.1 HIV Prevalence rate

The MLM should consider three focus areas with regards to HIV, namely:

- Focus on programmes that will minimise the risk
- Facilitation of programmes with provincial counterparts to address issues of HIV/AIDS
- The municipality should run awareness programmes from the Office of the Executive Mayor, coordinated through the Department of Community Services and Public Safety

In addition to the above-mentioned focus areas, the municipality may engage in the following activities:

- Developing and implementing programmes and projects on HIV/AIDS awareness.
- To provide slots/articles on local media to educate the community on how to prevent infection and provide counselling service to the HIV/AIDS victims.
- Provide support to people living with HIV/AIDS through the home-based care.
- Draft the HIV/AIDS workplace policy to assist the municipality in ensuring confidentiality in the workplace.
- Based on resources available, the municipality will provide support services to HIV/AIDS orphans and child headed Homes

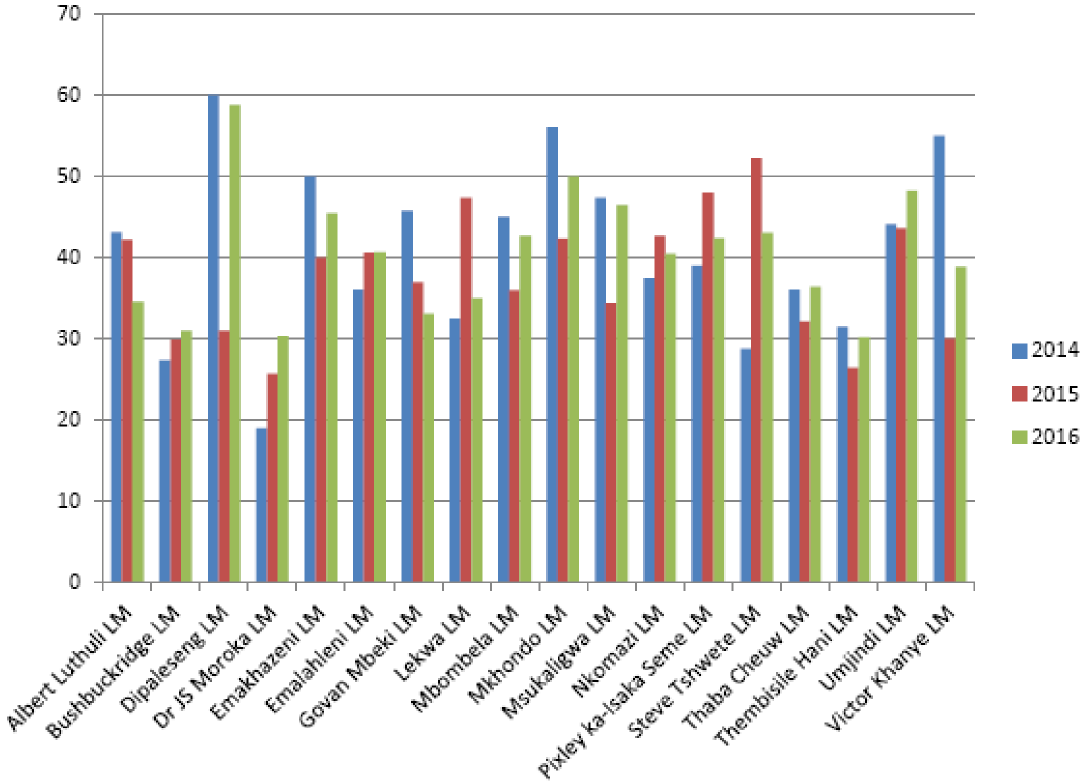


Figure 61: HIV Prevalence by Sub-District from 2014 – 2016 (MLM Draft IDP 2020/21)

9.5.2 Income profile

According to the MLM IDP the income level per household is considered a better barometer of poverty and reflects that 42% can be classified as Indigent as they earn less than R1,600 per month, as per Stats SA 2016.Not all these households have registered to qualify for access to free basic services as provided in the Indigent Policy guidelines. This issue is currently being progressed by the municipal administration.

There is a negative trend developing as more households are reportedly below the poverty line. The average household income level in the Mkhondo Local Municipality areas is reflected as R80 239 per annum, ranking it 9th with respect the overall province statistics standing. The income levels by Ward are demonstrated below and show where the highest level of unemployment and subsequently high poverty conditions prevail (Mkhondo Draft IDP 2020/21).

9.5.3 Key economic activities

With the different aspects listed above, Lazalelihlokohloko Mining and Projects (Pty) Ltd can assist to eradicate the deficiencies found within the MLM.

Figure 62: Key economic activities (Source: Mkhondo Draft IDP 2020/21)

9.6 Stakeholder perceptions

Stakeholder perceptions of a proposed development are critical inputs into the socio-economic process. A thorough understanding of the origin of stakeholder perceptions is therefore required, not only to put impacts into perspective, but to identify mitigation measures that will address potential social risks to the proposed project.

In addition to the stakeholders interviewed for the Social Labour Plan (SLP) study, the SLP also takes into account the stakeholder issues and concerns raised during the public participation process for the scoping and EIA study, which is still on-going. The EIA PPP has already consulted key stakeholders and government departments at a regional level, as well as some farm owners and other local stakeholders. Consultations for the SLP focused on potentially affected parties in the project area. The respondents raised the following main social issues and concerns:

- Loss of agricultural land will impact regional and national food security.
- Coal dust will affect grazing capacity of land as and crop yield of maize.
- Blasting will negatively impact neighbouring houses.
- Most directly affected households indicated that it would be impossible for them to reside near an operational open cast coal mine,
- Loss of jobs for farm workers could lead to resettlement of workers and their families. After the farm owner has sold the land, the farm workers will be without work.
- There are concerns that the project can exacerbate population influx into the surrounding area, placing additional pressure on housing and increasing crime rates in the area.
- Loss of sense of place, mostly as a result of potential air, noise and visual pollution, population influx, increased traffic and perceived increase in crime.
- There are concerns regarding the area’s groundwater, since most farmers and the community depend on boreholes for water supply. Mining pit dewatering could impact the catchment area.
- Pollution of ground and surface water.
- Negative impacts on the W51B & W51C catchment.
- Health problems associated with dust and other particles that emanate from the mining activities.
- Blasting damage will result in structural damage to residential, farming and business structures.

- The land is currently zoned for agriculture. The applicable application for rezoning must be submitted to the municipality.
- Pressure on community services and public infrastructure, especially roads. The proposed coal mine might worsen local road conditions.
- The lack of confidence in the local municipality and DMRE to put the needs of the people first.
- Uncertainties to whether compensation will be sufficient.
- Loss of biodiversity in an area.

10 IMPACT ASSESSMENT

10.1 Methodology

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

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

Table 24: Status of impacts

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

Table 25: Spatial scale of impacts

Rating	Description	Quantitative rating
Very low(VL)	Site-specific: Impacts confined within the project site boundary.	1
Low(L)	Proximal: Impacts extend to within 1 km of the project site boundary.	2
Medium(M)	Logal: Impacts extend beyond to within 5 km of the project site boundary.	3
High(H)	Regional: Impacts extend beyond the site boundary and have a widespread effect, i.e. > 5 km from the project site boundary.	4
Very high(VH)	Global: Impacts extend beyond site boundary and have national/global effect.	5

Table 26: Temporal scale of impacts

Rating	Description	Quantitative rating
Very low(VL)	Project duration: Impacts expected only for the duration of the project or not longer than one year.	1
Low(L)	Short term: Impacts expected on a duration timescale of 1-2 years.	2
Medium(M)	Medium term: Impacts expected on a duration timescale of 2-5 years.	3
High(H)	Long term: Impacts expected on a duration timescale of 5-15 years.	4
Very high(VH)	Permanent: Impacts expected on a duration timescale exceeding 15 years.	5

Table 27: Probability of impacts

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

Table 28: Severity of impacts

Rating	Description	Quantitative rating
Very low(VL)	Negligible: Zero or very low impact	1
Low(L)	Site-specific and short-term impacts	2
Medium(M)	Local scale and/or short-term impacts	3
High(H)	Regional and/or long-term impacts	4
Very high(VH)	Global scale and/or permanent environmental change	5

These five criteria combine to describe the overall significance rating. Calculated significance of impact determines the overall impact on (or risk to) a specified receptor and is calculated as the product of the probability (P) of the impact occurring and the severity (S) of the impact if it were to occur (Impact = P×S). This is a widely accepted methodology for calculating risk and results in an overall impact rating of Low (L), Low/Medium (LM), Medium (M), Medium/High (MH) or High (H). The significance of a particular impact is depicted in Table 30 and assigned a particular colour code in relation to its severity.

Table 29: Overall significance rating

Rating	Description	Quantitative rating
Low	PxS=1-3	(low impact significance)
Low/medium	PxS=4-5	(low/medium impact significance)
Medium	PxS=6-9	(medium impact significance)
Medium/high	PxS=10-12	(medium/high impact significance)
High	PxS=13-25	(high impact significance)

Table 30: Overall significance rating – Severity

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

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings described in the following.

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

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

- Essential: Measures that must be implemented and are non-negotiable.
- Best practice: Recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

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

11 IDENTIFICATION OF IMPACTS

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

- Views of I&APs
- Information based on literature reviews and desktop studies (EAPs, stakeholders, specialist inputs)
- Site visit with the project team
- Legislation
- Guidelines

The following potential impacts were identified:

- Contamination of ground and surface water (including AMD)
- Disturbance of geology and soils
- Land uses and capability
- Socio-economic
- Flora and fauna
- Traffic
- Watercourses (wetlands)
- Dust and air quality
- Blast and vibration
- Heritage and cultural resource
- Paleontological

Proposed specialist studies that will be done to assess the environmental impacts during the EIA phase:

- Geohydrological investigation, impact assessment and modelling
- Wetland delineation and impact assessment (PES and EIS)
- Surface water assessment and Floodline determination
- Civil engineering pollution control dam designs and storm-water management plan
- Blasting and vibration assessment
- Soils and land capability assessment
- Agricultural impact assessment
- Traffic impact assessment
- Rehabilitation management plan
- Heritage impact assessment
- Hydropedological study
- Mine Work Programme
- Paleontological desktop assessment

11.1 Positive and negative impacts of the proposed activities/development and alternatives

A comprehensive impact assessment has been conducted for the studies listed in **Table 31** below. The anticipated impacts are discussed to indicate whether it will be positive or negative.

Table 31: Anticipated impacts.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Surface and groundwater		
Ground and surface water contamination	Negative	• Construction should preferably take place in the dry season, as surface water runoff is minimal. • Additional storm water concentration must be contained. • Latrines should be kept away from sensitive drainage areas. Temporary latrines used during construction must be connected to the bulk sewerage lines if possible. Alternatively portable latrines should be sealed units that can be cleaned by truck and the waste must be taken to a suitable sewage facility for treatment. They should be well maintained and regularly cleaned, and sewage should not be allowed to directly access the groundwater. Latrines must be used as a priority. "Go to the bush" must be prohibited. • No uncontrolled discharges from the construction camp should be permitted. • All vehicles shall be properly maintained and serviced so that no oil leaks occur on site. • Any stockpiled soil and rock should have storm water management measures implemented. • The large roof structures to be implemented may enhance storm water volumes that need to be managed. • The storm water canal dumping storm water directly on the site must be rerouted. • A storm water plan must be available and used during all the phases of construction. • Vehicles and machines on site must be maintained properly to ensure that oil spillages are kept at a minimum. • Spill trays must be provided for refuelling of plant vehicles. • The designing of PCDs, Stormwater management areas, should consider the water bodies, slope and climate of the area, to effectively prevent pollution or contamination. • The designing of the infrastructures should take into consideration the gentle slope around the mining right area to effectively manage water. • The area falls on weathered aquifer, wastewater should be properly diverted from seepage, as the aquifer is weathered, and contamination is highly likely.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• Proper stormwater management is recommended to prevent the risk of water resources contamination.
Wetland/river/ hydrology/ geomorphology	Negative	• Storm water diversion measures should be implemented, to adequately control the stormwater onsite. • Availability of absorbent spills to prevent the hydrocarbons from flowing towards the wetlands, and preserving the soil on site. • Dust monitoring measures should be implemented, this is to effectively measure the dust being produced, which have the potential of settling in the wetlands. • Prevention measures of erosion should be implemented. • Post mining, rehabilitation should be ensured. • Dust suppression measures should be implemented during the construction and operational phase. • There should be regular maintenance of the mobile ablutions, to prevent spillage of waste into the wetland. • Develop or mining activity should not be allowed unless authorised by the department within the delineated boundary of the wetland identified. • Wetland integrity should be assessed quarterly from the construction phase to post close phase.
Potential reduction of catchment yield of the aquifers through dewatering	Negative	• Regularly monitor groundwater levels as per the recommendations of the geohydrological report.
Excavated materials that are stockpiled in incorrect areas can interfere with the natural drainage, cause sedimentation and water pollution	Negative	• The areas excavated must have vegetated berms to separate dirty and clean water systems and serve as an erosion control measure. • The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams, and surface water resources. • Upslope diversion and down-slope silt containment structures should be constructed. • Surface water resources must be monitored pre-mining and during construction, as per the monitoring programme.
Geology and soils		
Land use change which will affect the soil and land use capability during construction and post-mining operations. Loss of	Negative	• Should the No-Go alternative not be considered, mining activities must be located on low-medium agricultural potential land to minimise impacts. • Compensate landowners. • Rehabilitate areas disturbed by mining to return land to arable land where feasible. If not, other land uses (decommissioning phase) deemed socially, economically or environmentally applicable, must be considered.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
agricultural soils and land expected.		
Site clearance and levelling during the construction phase will create additional exposed areas and could trigger erosion and siltation, especially during rainy periods	Negative	• Prevent soil loss through erosion. • Develop appropriate storm water management system to control surface run-off over exposed areas. • Preserve soil fertility for later use. • Ensure all vehicles stay in the designated areas (for example, away from watercourses). • Plan to construct the majority of development during the dry winter months. • Establish temporary erosion and sedimentation trapping control measures during the construction phase
Storage of topsoil	Negative	• Remove and stockpile topsoil from roads, building platforms, stockpile and dam areas prior to construction. • Preserve topsoil and store in an appropriate manner to maintain viability and seed bank for future rehabilitation. • Store away from watercourses to prevent sedimentation and erosion. • Protect from alien plant establishment.
Soils and sediment management	Negative	• Where possible, mining activities in rivers and wetlands must proceed during dry winter months (low or zero-flow periods) to limit the potential for erosion linked to high run-off rates. • All soil stockpiles must be placed in an up-slope direction from the trench so that that any surface wash is directed into the trench and not further down-slope. • Any erosion points created during mining activity construction must be filled and stabilised immediately. Stockpiles must be protected from erosion, stored on flat areas where possible, and surrounded by appropriate berms. • No stockpiling of soils or materials should take place in a watercourse, including wetlands and the riparian zone of streams/rivers. • Periodic visual inspections of on-site water quality, identifying the source of any rapid increases in turbidity of surface waters and remediation of this where necessary (by a qualified Environmental Officer). Water must be pumped out into a well-vegetated area some distance from any watercourse to facilitate sediment trapping and reduce the chance of sediment entering wetlands/streams. • Excavated and imported material must be stored away from stream lines/areas of concentrated flow to limit the risk of sediment wash to downstream areas.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• Any topsoil removed from wetlands must be stockpiled separately from subsoil material and replaced once mining is complete to facilitate re-colonisation of the site. • Stripped topsoil from wetlands must not be buried or in any other way be rendered unsuitable for further use by mixing with spoil or subjected to compaction by machinery. • Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. The channel embankments must be rehabilitated to ensure both longitudinal and cross-sectional stability against summer floods.
Pollution		
Waste management/ pollution control	Negative	• Storage of potentially hazardous materials (e.g. fuel, oil, etc.) should be outside of the 100-year flood line, or within a horizontal distance of 500 m from a watercourse or wetland. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas. • Operation and storage of machinery and mining-related equipment must be done outside of wetlands and rivers wherever possible, unless authorised by a Water Use License (WUL). • Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of in the natural environment). Any contaminated soil from the site must be removed and rehabilitated timeously and appropriately. • Mechanical plant and bowsers must not be refuelled or serviced in or directly adjacent to any watercourse (including river and wetlands). • Provide adequate waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment, but to use available facilities. • Ensure that any rubbish is regularly cleared from the site, especially from wetlands/streams. • Routinely check machinery/plant for oil or fuel leaks each day before mining activities begin. No stockpiling must take place in a watercourse, including wetlands and the riparian area of the river. • Sanitation. Portable toilets (1 toilet per 30 users is the norm) to be provided where mining occurs. Workers must be encouraged to use these facilities and not the natural environment. Toilets must be located outside of the 1:100 yr. flood line of a watercourse or 500 m or from any natural water bodies, including streams and wetlands. Waste from chemical toilets should be

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		disposed of regularly and in a responsible manner by a registered waste contractor.
Social		
Recruitment strategies for the mine	Positive	N/A
Advantage to previously disadvantage individuals	Positive	N/A
Community development programmes	Positive	N/A
Upgrades and expansion of services will benefit local area	Positive	N/A
Increased income generation for local community	Positive	N/A
Increased job opportunities for local mining communities	Positive	N/A
Noise		
Noise emanating from heavy machinery and transport vehicles	Negative	• Noise barriers in the form of berms should be constructed as close to the noise sources as possible. • Mining-related machines and vehicles must be serviced regularly to ensure noise suppression mechanisms are effective, e.g. installing exhaust mufflers where possible. • Noisy machinery must be used predominately during daylight hours. • Grievance mechanism to record complaints should be kept on site and investigated. • Regular noise monitoring to take place.
Noise from blasting	Negative	• Blasting operations are generally intermittent and should be limited to the day when ambient noise levels are highest.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Infrastructure (e.g. contractor's yard, weighbridge, workshop and stores)	Negative	• To reduce the visual impact of permanent structures, colours for roofing, walls, etc. should have a matt finish to reduce reflection. • Infrastructure must be located away from sensitive and elevated areas.
Location of stockpiles, pollution control dams and discard dumps	Negative	• Place as far away as possible from roads and settlements. • Topsoil stockpiles must be vegetated as soon as possible, to reduce erosion and decrease visual disturbance. • Keep stockpiles as low as possible to reduce visual impact. • Plant fast-growing indigenous trees around the dams to enhance visual.
Lighting pollution	Negative	• Avoid up-lighting of structures. Rather direct the light downwards and focus it on the object to be illuminated. • Use non-UV lights where possible, as light emitted at one wavelength is less attractive to insects. This will reduce the likelihood of attracting insects and their predators in the site camps. • ''Noise level discussions have commenced between the Applicant (Lazalelihlokohloko Mining and Projects (Pty) Ltd) which has already conducted the studies and continuously monitor the noise level on the area at about 3km radius''.
Heritage and cultural		
Heritage resources disturbed/destroyed	Negative	12. From a heritage perspective, supported by the findings of this study, the proposed mining development and associated developments are feasible. However, the proposed mining development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed sites. 13. There was no recorded historical farmstead that is older than 60 years. 14. The recorded burial site must be demarcated by a danger warning sign and clearly marked to avoid any accidental damage by heavy mining equipment and haulage trucks. 15. The applicant must ensure that the descendants of the recorded graves are sought and notified that the proposed mining development has an impact (directly or indirectly) on their burial site. 16. No stone robbing or removal of any material is allowed. Any disturbance or alteration to this burial site would be illegal and punishable by law, under Section 36(3) of the NHRA. 17. Contractors and workers will be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51. (1).
Paleontological sites disturbed/destroyed	Negative	
Cultural places disturbed/destroyed	Negative	

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		18. Any measures to cover up the suspected archaeological material or collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement of the SAHRA. 19. The footprint impact of the proposed mining development and associated infrastructure must be kept to a minimum to limit the possibility of encountering chance finds. 20. Should any unmarked burials be exposed during mining, affected families must be tracked and consulted and relevant rescue/relocation permits must be obtained from SAHRA before any grave relocation can take place. A professional archaeologist must be retained to oversee the relocation process in accordance with the NHRA. 21. Should chance archaeological materials or human burial remains be exposed during mining work on any section of the proposed mining development laydown sites, work should cease immediately on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimise disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA (see appended Chance Find procedure for further details). 22. The project PPP must ensure that any cultural heritage related matters for this project are given due attention when they arise and are communicated to PHRA throughout the proposed project development. This form of extended community involvement would pre-empt any potential disruptions that may arise from previously unknown cultural heritage matters that may have escaped the attention of this study. 23. The landowner must be requested to declare burial sites on their farmsteads to the EAP. 24. Subject to the recommendations made herein and the implementation of the mitigation measures and adoption of the project EMP, there are no other significant cultural heritage resources barriers to the proposed mining right application. The heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations made.
Traffic		
Increased traffic volumes on the existing road networks	Negative	• Implement speed limits and safety controls on-site. • Construct access roads in safety limits from other crossings. • Possible road upgrades where required. • Create safe environment for pedestrians, animals and motorists.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• Create fauna underpasses where necessary (e.g. bridge crossings).
Blasting Impact Assessment Report		
Blasting and vibration	Negative	• Use, handle and transport explosives in accordance with local and / or national explosives safety regulations. • Assign certified blasters or explosive experts to conduct blasting. • Manage blasting activities in terms of loading, priming, and firing explosives, drilling near explosives, misfired shots and disposal.
Safety		
Blasting	Negative	• Clearly demarcate areas and erect signs to indicate blasting zones.
Roads and vehicles	Negative	• Speed limits must be in place on site and before access roads on a provincial or national road. • Ensure drivers are trained in road safety.
Surrounding neighbours	Negative	• Personnel are not permitted on other properties without permission. • Avoid conflict with surrounding landowners. • Safety specialist will be appointed and assessments will be conducted. Recommendations will be implemented.
Air quality		
Dust pollution	Negative	• The removal of vegetation will be minimised during stripping to reduce the effects of dust pollution due to exposed soil. • Water or dust control agents must be used in working areas, and roads will be sprayed for dust suppression on a regular basis in designated susceptible areas during heavy usage. • Dust monitoring must be undertaken in accordance with the monitoring programme. It is recommended that topsoil stockpiles be vegetated to sustain biological components and prevent dust emissions. • Reduction of dust fallout levels and particulate matter. • All coal haul trucks must be covered with a tarpaulin. • The overland conveyor belt should be covered and coal on the conveyor should be sprayed to reduce emissions. • ‘’Air quality discussions have commenced.

Project phase	Activities	Impacts
Construction	• Site establishment	• Loss of land capability • Loss of topsoil as a resource

Project phase	Activities	Impacts
	• Site clearing, including the removal of topsoil and vegetation • Construction of mine-related infrastructure, including haul roads, PCD • Construction of plant • Relocation of Infrastructure; • Blasting and development of initial box-cut for mining, including stockpiling from initial box cuts • Temporary storage of hazardous products, including fuel and explosives	• Soil compaction from heavy machinery and vehicles • Soil erosion due to wind and surface water run-off • Loss of land use and capability • Increased erosion and compaction • Loss of habitat and species • Habitat fragmentation • Increased alien vegetation • Sedimentation leading to siltation and deteriorated water quality • Reduced surface water infiltration and baseflow as a result of soil compaction and impervious surfaces • Alteration in surface water drainage patterns • Increased velocity in surface water run-off leading to erosion and sedimentation • Lowering of the water table, if the site clearing and construction activities will take place below the water table • Construction and development activities in a greenfield site are negative to wetlands and catchment • Loss of wetland habitat (soils and vegetation)
Operational	• Stripping topsoil and soft overburden • Removal of overburden, including drilling and blasting of hard overburden • Loading, hauling and stockpiling of overburden • Development and operation of surface infrastructure • Drilling and blasting of coal • Load, haul and stockpiling of RoM coal • Use and maintenance of haul roads for the transportation of coal to the washing plant • Water use and storage on-site • Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste	• Loss of land capability • Loss of topsoil as a resource • Soil compaction from heavy machinery and vehicles • Soil erosion due to wind and surface water run-off • Loss of land use and capability • Increased erosion and compaction • Loss of habitat and species • Habitat fragmentation • Increased alien vegetation • Increased run-off resulting in water contamination and/or the deterioration of the water quality • Reduction of catchment yield as run-off water contained in PCD • Water level lowering due to mining block dewatering • Groundwater contamination due to PCD seepage • Groundwater contamination due to seepage from overburden stockpiles, slurry and discard deposition • Loss of wetland habitat (soils and vegetation) • Perforation of rock and groundwater reserves leading to severe hydrological and geomorphological impacts to wetlands and catchment • Mining operations negative impact to functioning wetlands and catchment
Decommissioning	• Dismantling and removal of all infrastructure, including	• Mine decanting causing groundwater and possible stream contamination

Project phase	Activities	Impacts
	transporting materials off-site • Rehabilitation, including spreading of topsoil, revegetation and profiling or contouring as per original landscape features • Environmental monitoring of decommissioning activities • Storage, handling and treatment of hazardous products and waste • Post-closure monitoring and on-going rehabilitation	• Surface water contamination • Significant potential negative impacts to functioning wetlands and catchment if not done correctly • Spread of alien invasive vegetation • Increased soil compaction erosion and subsequent sedimentation into the wetland ecosystems • Post-mining water decant is predicted to occur once the final void has been rehabilitated and groundwater levels are allowed to return back to natural levels (this decant may be acid-forming)

11.2 Mitigation measures

The impacts of development can be minimised if measures are implemented to reduce them. The mitigation measures ensure that the development considers the environment and the predicted impacts to minimise impacts and achieve sustainable development. Recommendations as part of mitigations will be listed in Section 10 for all the studies to be conducted (Palaeontology, HIA and wetlands, etc.).

11.3 Motivating the preferred site

As a result of the scoping phase impact assessment and the sensitivity mapping exercise, a preferred layout alternative is assessed in this EIA phase.

12 PLAN OF STUDY/TERMS OF REFERENCE

The scoping phase identified potential environmental impacts and discussed alternatives considered. The following section outlines the proposed plan of study to be conducted for the various environmental aspects during this EIA phase. It is important to note that the plan of study was guided by comments obtained from I&APs and other stakeholders during the scoping phase PPP.

12.1 Impact assessment phase objectives

The impact assessment phase will have the following objectives:

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

12.2 Impact assessment phase tasks

The impact assessment phase has four key elements, namely:

- Specialist studies: Specialist studies identified in the scoping phase and any additional studies that may be required by the authorities, will be conducted during the initial EIA phase. The relevant specialists will be appointed to conduct the various assessments. They will gather baseline information relevant to the study and assess impacts associated with the development. Specialists also make recommendations to mitigate negative impacts and optimise benefits. The resulting information is synthesised into the draft EIAr that will be made available to I&APs for review.
- EIAr: This report’s purpose is to gather environmental information and evaluate the overall project impacts, consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIAr identifies mitigation measure/management recommendations to minimise negative impacts and enhance benefits.
- The draft EIAr and associated reports will be made available for public and authority review and comment for a period of thirty days as it was for scoping phase. The availability of the draft EIAr will be communicated to all registered I&APs and will be easily accessible. After comments have been received, the final EIAr will be compiled and submitted to the competent authority (DMRE) for review. This report will assist the DMRE in making an informed decision.
- EMPr: The EMPr provides guidelines to the proponent and the technical team on how to best implement the mitigation measure/management recommendations outlined in the EIAr during the

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

- PPP: The PPP initiated during the scoping phase, is continued. This includes continuous engagement with I&APs and stakeholders, through meetings, receiving comments, issues and concerns raised by I&APs and the authorities during the review period, and provides relevant responses to these comments.

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

According to the MPRDA and NEMA regulations, feasible alternatives need to be considered and assessed during the scoping and impact assessment phase of the project. During the scoping phase, based on professional judgement of the EAP, the engineering designs, specialist inputs, and I&AP comments, alternatives have been considered. The alternatives identified must serve to achieve the triple bottom-line of sustainability i.e. they must meet the social, economic and ecological needs of the public. The alternatives must also aim to address the key significant impacts of the proposed project by maximising benefits and avoiding or minimising the negative impacts. The primary objective must be to avoid all negative impacts, rather than minimise them.

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

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

A comparative assessment (in fulfilment with the above criteria) of all alternatives identified was undertaken as part of the Impact Assessment Phase.

14 TERRESTRIAL ECOLOGY

The Terrestrial Ecology Assessment was not undertaken.

14.1 Terrestrial threatened ecosystem

The SANBI, in conjunction with the DEA (now Known as DFFE), released a draft report in 2009 entitled *Threatened Ecosystems in South Africa: Descriptions and Maps*, to provide background information on the List of Threatened Ecosystems (SANBI, 2009). The purpose of this report was to present a detailed description of each of South Africa's ecosystems and to determine their status using a credible and practical set of criteria. The following criteria were used in determining the status of threatened ecosystems:

1. Irreversible loss of natural habitat
2. Ecosystem degradation and loss of integrity
3. Limited extent and imminent threat
4. Threatened plant species associations
5. Threatened animal species associations
6. Priority areas for meeting explicit biodiversity targets as defined in a systematic conservation plan

In terms of section 52 (1) (a), of the NEM:BA, a new national list of ecosystems that are threatened and in need of protection was gazetted on 9 December 2012 (Government Notice 1002 (Driver et. al., 2004). The list classified all threatened or protected ecosystems in South Africa in terms of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), or Protected. The purpose of categorising these ecosystems is to prioritise conservation areas in order to reduce the rates of ecosystem and species extinction, as well as preventing further degradation and loss of structure, function, and composition of these ecosystems. It is estimated that threatened ecosystems make up 9.5% of South Africa, with critically endangered and endangered ecosystems accounting for 2.7%, and vulnerable ecosystems 6.8% of the land area. It is therefore vital that Threatened Terrestrial Ecosystems inform proactive and reactive conservation and planning tools, such as Biodiversity Sector Plans, municipal Strategic Environmental Assessments (SEAs) and Environmental Management Frameworks (EMFs), Environmental Impact Assessments (EIAs) and other environmental applications (Mucina et al., 2006). According to data sourced from the SANBI, the proposed project is situated in a VU ecosystem (Eastern Highveld Grassland).

The Regulations in terms of Chapter 5 of the NEMA requires a description of the potential impacts the proposed development will have on the environment. Table 32 presents details of the identified impacts for the different proposed project activities and their proposed mitigation measures.

Table 32: Identified impacts for the different proposed project activities and their proposed mitigation measures.

Activity/aspect	Impact	Stage	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures
Vegetation clearing for the mining purpose	Destruction of protected plant species	Construction/ mining	Negative	Low (4)	Site only (1)	Long term (4)	Definite (5)	Medium (45)	1. Avoid areas like sheetrock with protected or listed plants on-site. 2. Use available farm roads to avoid trampling red listed plant species. 3. Supervision by an ecologist to ensure success of the rescue operation.
	Removal of the natural vegetation	Construction/ mining	Negative	Moderate (6)	Site only (1)	Long term (4)	Definite (5)	Medium (55)	4. Due to the sensitivity of the areas it is advised that areas designated for vegetation clearing should be identified, visibly marked off and approved as part of mining map. 5. Vegetation clearing areas should be kept to a minimum and restricted to the mining sites. 6. Exposed areas should be rehabilitated with plants indigenous to the project area after construction.
	Disturbance to animals on site	Construction/ mining	Negative	Moderate (6)	Local (2)	Short term (3)	High (4)	Medium (44)	7. Do not disturb nests, breeding sites or young animals. Do not attempt to kill or capture snakes unless a direct threat to employee safety. 8. Dogs or other pets are not allowed at the worksite, as they are threats to the natural wild animal. 9. A low speed limit should be enforced on-site to reduce wild animal-vehicle collisions. 10. No animals must be intentionally killed or destroyed and poaching and hunting must be prohibited on-site. 11. Severe contractual fines/immediate dismissal must be imposed on any contract employee who attempts to snare or otherwise harm remaining faunal species. 12. Hunting weapons are prohibited on-site. 13. Contract employees must be educated on the value of wild animals and the importance of their conservation. 14. The ECO must conduct regular site inspections to remove any snares or traps that have been erected.

Activity/aspect	Impact	Stage	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures
									15. Employees and contractors must be made aware of the presence of, and rules regarding, flora and fauna through suitable induction training and on-site signage. 16. Ensure that the colours used to paint the buildings, including the roof, blend with the environment.
	Increased soil erosion, increase in silt loads and sedimentation	Construction/ mining	Negative	Low (4)	Local (2)	Long term (4)	Definite (5)	Medium (50)	17. After mining, disturbed areas must be rehabilitated. 18. Avoid areas with sensitive soils and steep slopes during rain or windy season. 19. Ensure that roads are not paved, but well-maintained (gravel) to reduce water speed and promote infiltration.
	Establishment and spread of declared weeds	Construction/ mining	Negative	High (8)	Site (1)	Long term (4)	Definite (5)	High (65)	20. The best mitigation measure for alien and invasive species is the early detection and eradication of these species. This will be done using a monitoring programme. 21. An alien invasive management programme must be developed and implemented to control alien invasive species.
Waste generation	Pollution due to oil and fuel spills, erosion, and ablution facilities.	Construction/ mining	Negative	Moderate (6)	Local (2)	Long term (4)	Definite (5)	High (60)	22. Proper ablution and storage facilities must be provided on-site. 23. Proper Standard Operating Procedures (SOPs) must be in place to regulate refuelling and other potential polluting activities. 24. Must have rehabilitation strategy as part of EMP, like a clean-up plan/strategy if spills occur and proper facilities (ablution) to ensure no sewerage spills into drainage lines and streams.
Wetland destruction	Mining on wetlands/along wetlands	Mining	Negative	High (8)	Local (2)	Long term (4)	Definite (5)	High (70)	25. Mining across wetlands must not take place and coarse immovable material (like boulders and other rock in river channels) must not be removed to ensure continued stability and functioning of the river systems. 26. Ensure that mining activities are carefully monitored to limit impact on wetlands/riparian areas (particularly in-

Activity/aspect	Impact	Stage	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures
									stream habitat); must be approved by Water Use License (WUL). 27. Do not lower the original stream bed / profile of the wetland as this may result in scouring in an upstream direction and further alteration of bed conditions.

CBAs are terrestrial and aquatic features in the landscape that are critical in retaining biodiversity and supporting continued ecosystem functioning and services (SANBI, 2007). These form the key output of a systematic conservation assessment and are the biodiversity sectors' inputs into multi-sectoral planning and decision-making tools.

The primary purpose of CBAs is to inform land-use planning and the land-use guidelines attached to its aim to promote sustainable development by avoiding loss or degradation of important natural habitat and landscapes in these areas and the landscape as a whole. CBAs can be used to inform protected area expansion and development plans. The use of CBAs here follows the definition laid out in the guidelines for publishing bioregional plans (Anon, 2008):

1. "Critical biodiversity areas (CBAs) are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses. "
2. "Ecological support areas (ESAs) are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas."

The guideline for bioregional plans defines three basic CBA categories based on three high-level land management objectives.

Table 33: Framework linking spatial planning categories (CBAs) to land-use planning and decision-making guidelines based on high-level land biodiversity management objectives.

CBA category	Land management objective
PA & CBA 1	Natural landscapes • Ecosystems and species fully intact and undisturbed. • Areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost, targets will not be met. • These are landscapes that are at or past their limits of acceptable change.
CBA 2	Near-natural landscapes • Ecosystems and species largely intact and undisturbed. • Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets. • Landscapes that are approaching, but have not passed their limits of acceptable change.

CBA category	Land management objective
Ecological Support Areas (ESA)	**Functional landscapes** • Moderately to significantly disturbed ecosystems still able to maintain basic functionality. • Individual species or other biodiversity indicators may be severely disturbed or reduced. • These are areas with low irreplaceability with respect to biodiversity pattern targets only.
Other Natural Areas (ONA) and Transformed	**Production landscapes** • Manage land to optimise sustainable utilisation of natural resources.

According to the Mpumalanga conservation plan, the majority of the site is located in a disturbed area, and this is due to the cultivation that is taking place on-site with the remainder of the site classified as a CBA. All the natural grassland, rocky outcrop and the vegetation associated with watercourses in the project area classify as CBAs according to the Mpumalanga Biodiversity Sector Plan (MBSP). These are the most sensitive habitats in the project area and represent areas where impacts on ecology would be significant.

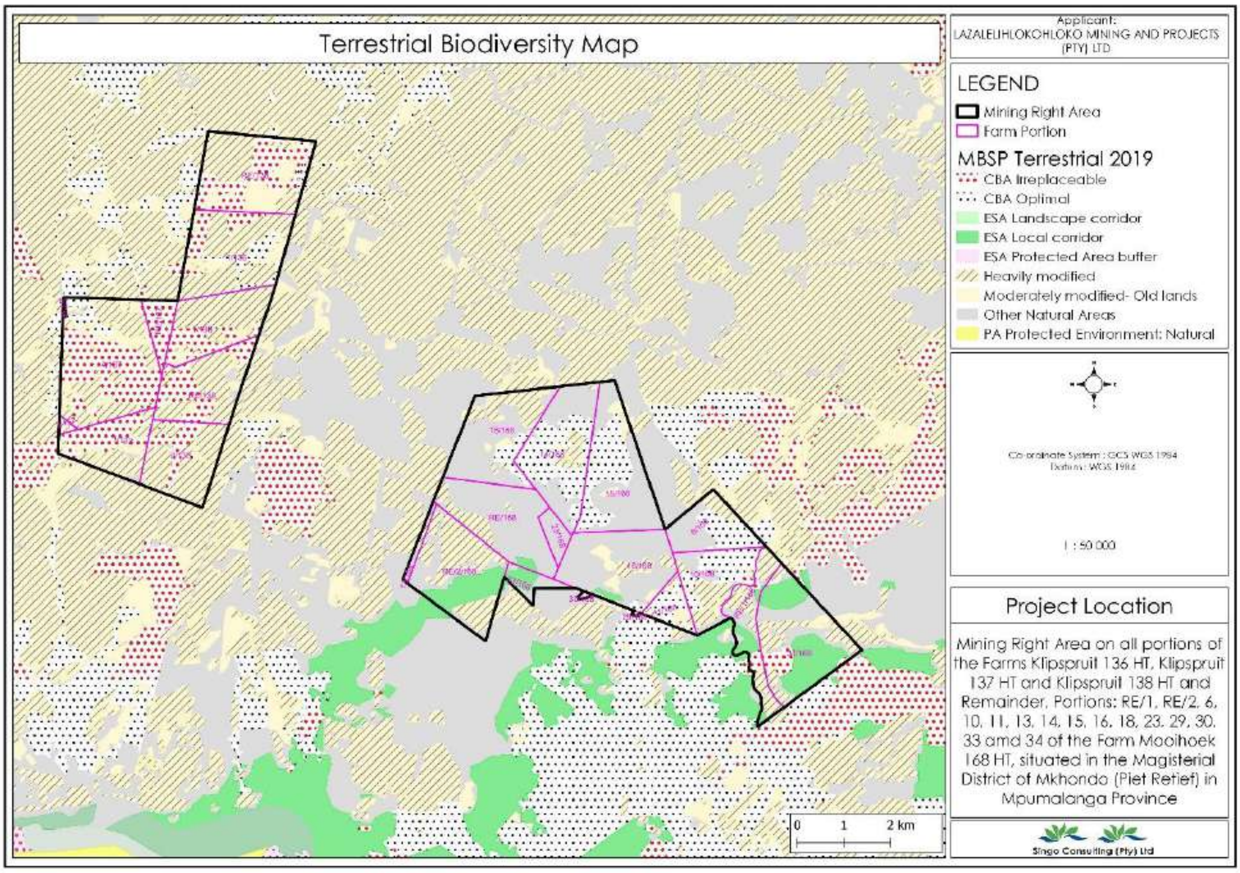


Figure 63: Terrestrial Biodiversity map of the proposed MRA. [Singo Consulting,2022].

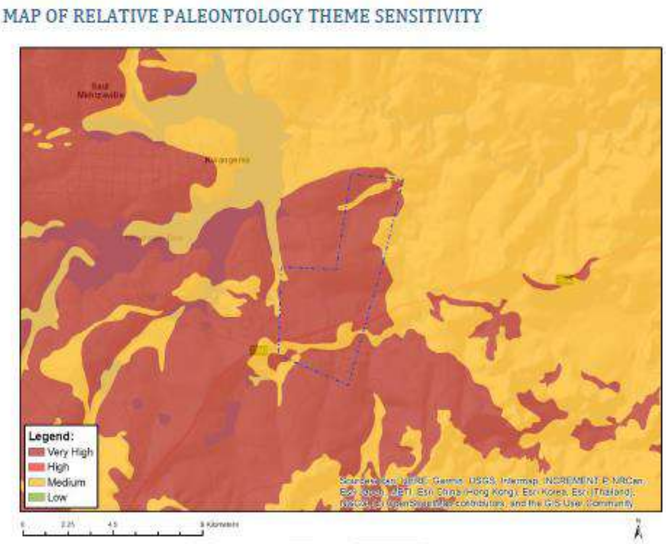
Table 34: Four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining

Category	Biodiversity priority areas	Risk for mining	Implications for mining
Legally protected	• Protected area (including national parks, nature reserves, world heritage sites, protected environments, nature reserves) • Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002)	Mining prohibited	Mining projects cannot commence, as mining is legally prohibited. Although mining is prohibited in a protected area, it may be allowed in protected environments if the minister of Mineral Resources and minister of Environmental Affairs approve it. In cases where mining activities were conducted lawfully in protected areas before section 48 of the Protected areas Act (No 57 of 2003) came into effect, the minister of Environmental Affairs may, after consulting with the minister of Mineral Resources allow such mining activities to continue, subject to prescribed conditions that reduce environment impacts.
Highest biodiversity importance	• Critically endangered and endangered ecosystem • CBAs (or equivalent areas) from provincial spatial biodiversity plans • River and wetland freshwater Ecosystem priority Areas (FEPAs) and a 1 km buffer around these FEPAs • Ramsar sites	Highest risk for mining	Environmental screening, EIA and associated specialist studies should focus on confirming the presence and significance of these biodiversity features and provide site-specific basics which apply to the mitigation hierarchy to inform regulatory decision-making for a mining Water Use License (WUL) and environmental authorisations. If they are informed, the likelihood of a fatal flow for new mining projects is very high due to the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are considered necessary to ensure the protection of biodiversity, environmental sustainability and human well-being. An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact biodiversity. These assessments should fully take into account the environment sensitivity of the area, the overall environment and socio-economic cost benefits of mining, as well as the potential strategic importance of the mineral to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.

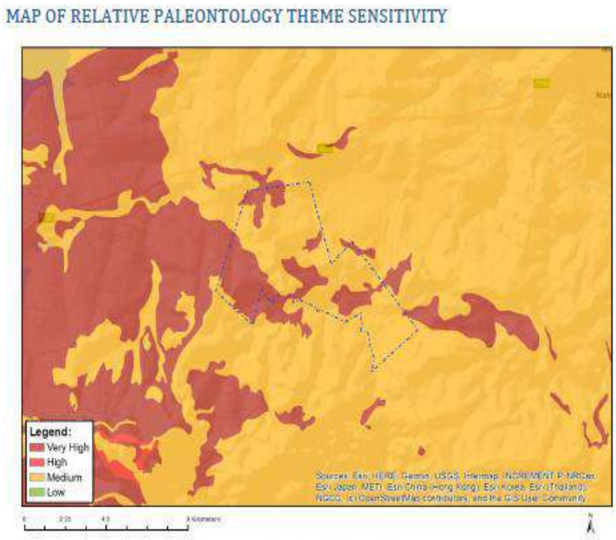
Category	Biodiversity priority areas	Risk for mining	Implications for mining
High biodiversity importance	• Protected area buffers (including buffers around national parks, world heritage sites and nature reserves) • Trans frontier conservation area (remaining areas outside formally proclaimed protected areas) • Other identified priorities from provincial spatial biodiversity plans • High water yield areas • Coastal protection zone • Estuarine functional zone • The status of world heritage sites is subject to a current intra-governmental process	Higher risk for mining	These areas are important for conserving biodiversity, supporting or buffering other biodiversity priority areas and maintaining important ecosystem services for particular communities or the country as a whole. An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. Mining options are limited in these areas, and limitations for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and /or authorisations.
Moderate biodiversity importance	• Ecological support areas • Vulnerable ecosystems • Focus areas for protected areas expansion (land-based and offshore protection)	Moderate risk for mining	These areas are of moderate biodiversity value. EIA and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features (e.g., threatened species) not included in existing datasets, and provide site-specific information to guide the application of the mitigation hierarchy. Authorisation may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.

15 PALAEONTOLOGY

Palaeontology is the scientific study of life that existed prior to, and sometimes including, the start of the Holocene Epoch (roughly 11,700 years before present). It includes the study of fossils to classify organisms and study interactions with each other and their environments. Palaeontology lies on the border between biology and geology but differs from archaeology in that it excludes the study of anatomically modern humans. It now uses techniques drawn from a wide range of sciences, including biochemistry, mathematics, and engineering. The MRA is entirely covered with very high palaeontology theme sensitivity as shown in **figure 60** below.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Figure 64: Maps of relative palaeontology theme sensitivity.[Screening Report,2022].

15.1 Archaeological and cultural heritage

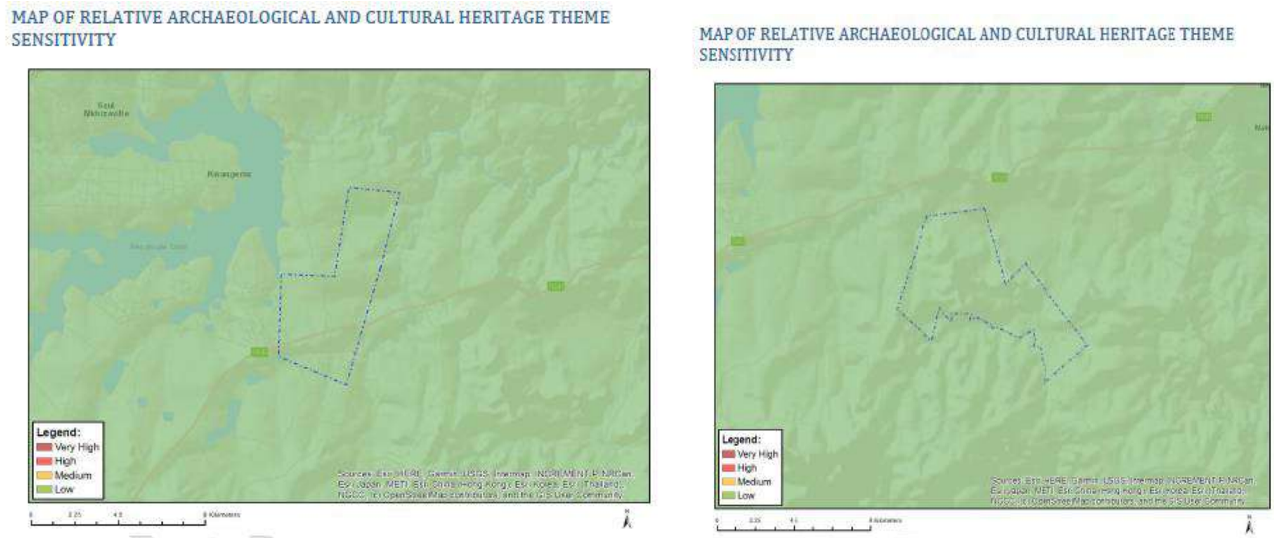
Archaeological sites are man-made sites constructed through time. Archaeological and cultural heritage sites can be separated into two basic types, one indicated by artefacts and one by features. Artefacts are defined by any movable or transportable object made and/or used by humans. To mention a few, this can include a number of raw materials which often take the form of tools, weapons, ornaments and ceremonial items such as ground stone, clay, bone, wood, etc. of the many common historic artefacts, beads, pots, farm equipment are mostly common.

Features are described as non-movable or non-transportable corroboration of past human behaviour, activity and technology. Historic features may include evidence of fires and fire pits, cemeteries, garbage pits and dumps, etc. shows archaeological and cultural heritage sensitivity of the proposed development area. The major portion of the development site is indicated as a medium archaeological and heritage combined sensitivity. According to the report, the feature indicated as medium sensitivity is a mountain or a ridge.

From the Palaeontological Study conducted by Dr H Fourie, All the land involved in the development was assessed (ni,nii) and none of the property is unsuitable for development. Areas that would involve mitigation and may need a permit from the South African Heritage Resources Agency are discussed. if any palaeontological material is exposed during clearing, digging, excavating, drilling or prospecting, SAHRA must be notified. All development activities must be stopped, a 30 m barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures. Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.

16 HERITAGE

The Archaeological & Heritage Impact Assessment study was undertaken by a specialist. Two burial sites were observed during ground truthing namely PBSO1 and PBSO2 as indicated on **Figure 68**. below. The mine layout plans must provide for 100m buffer zones from the recorded burial sites. An online application was completed on the South African Heritage Resource Agency (SAHRA).See **Figure 66** below for proof of Consultation.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Figure 65: Map of relative archaeological and cultural heritage theme sensitivity.[Screening Report,2022].

VIEW EDIT

Mining Right Apllication on various portions of the farm Mooihoek 168 HT,Klipspruit 136 HT,Klipspruit 137 HT & Klipspruit 138 HT

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CaseHeader | LocationInfo | Admin

Status: SUBMITTED

HeritageAuthority(s): SAHRA
MPHRA

Case Type: Section 38 (1) - Decision from Heritage Authority required

Development Type: Mining

ProposalDescription:
ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR COAL MINING RIGHT, INTEGRATED WATER USE LICENSE, WASTE MANAGEMENT LICENCE, AND ENVIRONMENTAL AUTHORISATION APPLICATIONS ON PORTIONS (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) OF THE FARM MOOIHOEK 168 HT, PORTIONS (RE,1, 2, 3, 4) OF THE FARM KLIPSPRUIT 136 HT AND PORTIONS (RE,1, 2, 3, 4) OF THE FARM KLIPSPRUIT 138 HT, LOCATED IN THE MAGISTERIAL DISTRICT OF PIET RETIEF , MPUMALANGA PROVINCE. DMRE REF: MP 30/5/1/2/2/10230 MR

ApplicationDate: Wednesday, October 12, 2022 - 08:23

CaseID: 19800

Applicants: Lazalelihlokohlo Mining and Projects (Pty) Ltd

Consultants/Experts: Ndinannyi Kenneth

OtherReferences:

Dept	CaseReference	DueDate	FinalDecision
DMR-MP	MP 30/5/1/2/2/10230 MR		

ReferenceList:

AdditionalDocuments

1 Scoping report pdf

Figure 66: Proof of SAHRA consultation.

Mining Right Apllication on various portions of the farm Mooihoek 168 HT,Klipspruit 136 HT,Klipspruit 137 HT & Klipspruit 138 HT

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Status: Studies Submitted

HeritageAuthority(s): SAHRA
MPHRA

Case Type: Section 38 (8) - Statutory Comment Required

Development Type: Mining

ProposalDescription:
ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR COAL MINING RIGHT, INTEGRATED WATER USE LICENSE, WASTE MANAGEMENT LICENCE, AND ENVIRONMENTAL AUTHORISATION APPLICATIONS ON PORTIONS (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) OF THE FARM MOOIHOEK 168 HT, PORTIONS (RE,1, 2, 3, 4) OF THE FARM KLIPSPRUIT 136 HT AND PORTIONS (RE,1, 2, 3, 4) OF THE FARM KLIPSPRUIT 138 HT, LOCATED IN THE MAGISTERIAL DISTRICT OF PIET RETIEF , MPUMALANGA PROVINCE. DMRE REF: MP 30/5/1/2/2/10230 MR

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DMR-MP	MP 30/5/1/2/2/10230 MR		

Heritage Reports: palaeontology
Heritage Impact Assessment

ReferenceList:

AdditionalDocuments

1. Scoping report.pdf
2. BID.pdf
3. BID.pdf

Figure 67: Proof of HIA & Palaeontology report upload. [SAHRA online portal].

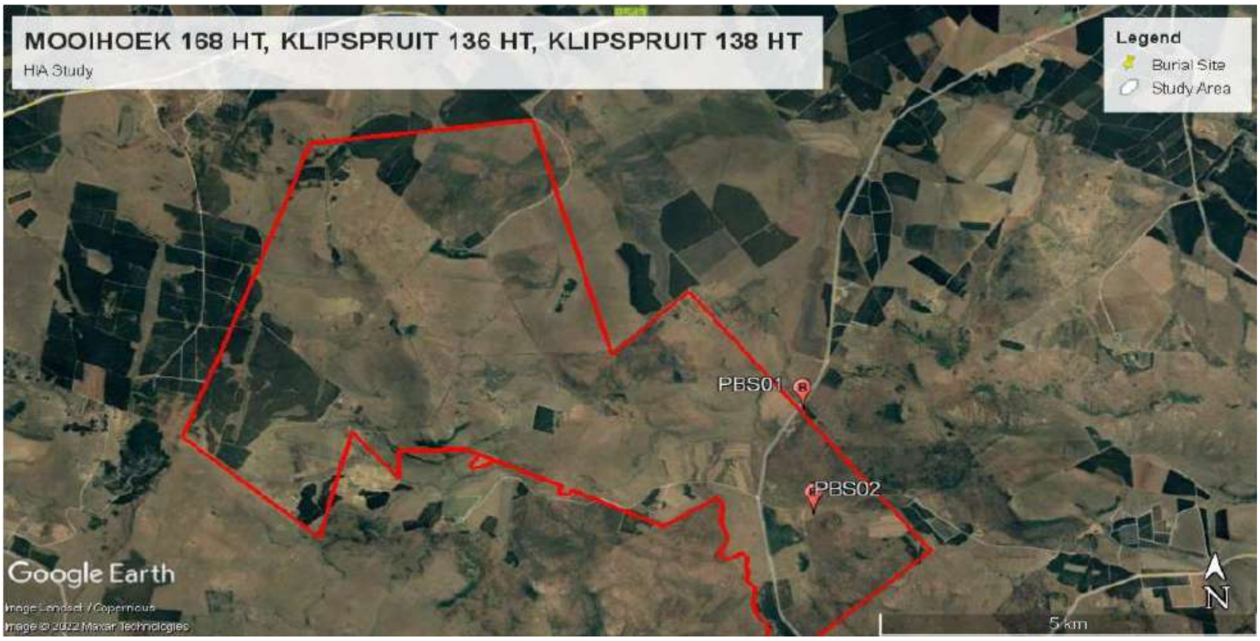


Figure 68: Burial Sites observered on site.[(ISS (Pty) Ltd, 2022)**].**

16.1 Methodology

The HIA was structured in four phases: field survey, consultation, report compilation and report review. The methodology was informed by the SAHRA Guidelines on Impact Assessment for Development Projects, as well as the relevant provisions of the local heritage and environmental legislation. We conducted desktop studies, field surveys, consultations, report compilations and report reviews.

16.1.1 Phase I: Desktop studies

Desktop studies are crucial to the success of any project, because they determine not just what is known but can identify gaps that must be closed during the study to meet the aims and objectives of the project. Literature on the archaeology and heritage character of the project was reviewed. A review of SAHRIS and other databases was conducted online. Further review of the relevant local and international legal frameworks was also done. Relevant documents and databases such as Google Earth and other available information were consulted. As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied.

The desktop studies were carried at university libraries, national libraries, local municipality libraries and archives. Electronic databases such as Google Earth, Google Map and Google Images were consulted as well. Special attention was given to provincial and local authority development plans so that the HIA contributes to the attainment of local objectives.

16.1.2 Phase II: Fieldwork

The aim of the project is to provide the client with an HIA that will support decision-making to ensure protection of the heritage resource base of the project area. The heritage resources must be identified, assessed and ranked. This enables a proper definition of the resource and its boundaries. This requires the participation of a multi-disciplinary team with experience in heritage management, heritage, palaeontology, planning and risk management fields. This fieldwork aimed at adding to the gaps identified during the review of the existing documentation. The field survey was undertaken on the **02nd of May 2019.** The main focus of the survey involved a pedestrian survey which was conducted on the proposed Mining Right Application site. The pedestrian survey focused on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld; stands of grass which are taller that the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds.

Detailed photographic recordings were also undertaken where relevant. The findings were analysed in view of the proposed mining development to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed mining development. The literature survey suggests that, prior to the 20th century, modern agriculture and associated infrastructure, the general project area would have been a rewarding region to locate heritage resources related to the Stone Age, Iron Age and historical sites (Bergh 1999). However, the situation today is completely different. The study area now lies on a clearly modified landscape that has previously been cleared of vegetation.

16.1.3 Phase III: Consultation

Public consultations are being conducted by the EAP and issues raised by Interested and Affected parties will be presented during Specialist integration meetings for the project. Issues relating to heritage will be forwarded to the heritage specialist. The study team consulted the farm workers who assisted in identifying burial sites located within the proposed mining right site.

16.1.4 Phase IV: Report compilation

Report compilation and impact assessment. The Archaeological & Heritage Impact Assessment study will be compiled by a specialist during the EIA phase.

16.2 Field study results

The main cause of impacts on archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is dependent on its geological and spatial context. This means that even though, e.g., a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position. The severe impacts are likely to occur during clearance, construction of access roads and other amenities for the mine, as well as foundations of buildings, indirect impacts may occur during movement of mining equipment and vehicles.

Various specialists conducted several Phase 1 Archaeological/ Heritage studies for various infrastructure developments in the project area since 2002. Although the proposed Mining Right Application site did not yield any confirmable heritage resources. Should any heritage site be discovered, the sites must be clearly marked, and workers made aware of their existence and significance. In this case a management plan covering the traditional burial site must be compiled. However, the lack of confirmable archaeological sites recorded on the Mining Right Application site is thought to be a result of limited ground surface visibility due dense grass cover. This may have impended the detection of other physical cultural heritage remains, or archaeological signatures immediately associated with the mining site. It should be borne in mind that the absence of confirmable and significant archaeological cultural heritage site is not evidence in itself that such sites did not exist within the proposed project site.

Based on the significance assessment criterion employed for this report, the proposed mining development site was rated low from an archaeological perspective although it is surrounded by significant sites. It should be noted that significance of the sites of Interest is not limited to presence or absence of physical archaeological sites. Significant archaeological remains may be unearthed during mining.

17 TRAFFIC

The Traffic Impact Assessment (TIA) was conducted by Singo Consulting (Pty).The assessment was conducted at the first T- Junction access road on the proposed development of the proposed mining right application project is on road R543 and an unnamed road that leads to KwaNgema clinic in KwaNgema village, Piet Retief, and the second four-way Junction access road is on an unnamed road in Driefontein next to Vilakazi bottle store and Driefontein Build it.

17.1 Public transport

Public transport will be an integral part of the operations. Public transportation like taxis and buses will be positively impacted economically as more people who will be working at the proposed Coal Mining Right and requiring public transports for commuting.

17.2 Haul roads

These are internal mine roads and do not have an external traffic impact that can be addressed in terms of the guidelines for traffic impact studies. The traffic volumes and soil conditions determine what the roads will look like and what maintenance programmes will be required to maintain these roads at acceptable standards for the duration of the mining operation. Dust is a major problem and normally the most visible impact from outside the mining area.

17.3 Traffic generation

The proposed new mining right at Lazalelihlohloko Mining and Projects (Pty) Ltd project will generate additional traffic on the surrounding road network during the operational phase. The estimated employment figures for the construction and operational phases of Lazalelihlohloko Mining and Projects (Pty) Ltd were projected from the scale of the operation.

17.4 Impact assessment

The predicted impacts of the traffic generated by the proposed Lazalelihlohloko Mining and Projects (Pty) Ltd project area on the surrounding road network are quantitatively evaluated in this chapter of the study. The purpose of this impact evaluation is to assign relative significance to the predicted impacts associated with the project and to determine the manner in which these impacts are to be avoided, mitigated, or managed, if need to be.

17.4.1 Impact on the Existing Traffic Conditions on the External Road Network

The proposed construction and operations phases at the site will generate additional traffic along the access road with the main being the unnamed road connects to R545, whilst there will be an increase in traffic flows along these roads, in traffic capacity analysis terms, the increases are medium, and the road network capacity can partially accommodate the increased traffic flows due to the relatively low existing traffic flows on these roads compared to their capacity.

The impact of the additional traffic generated by the proposed construction on the existing traffic conditions (road capacity and congestion) during the construction phase and the operational phase are illustrated in the table below. The closure / post closure phase impact is expected to be similar or less than the construction phase.

Table 35: Impact of Project Generated Traffic on Existing Traffic Conditions.

Operations								
	Magnitude	Duration	Scale	Consequence	Probability	Significance	+-	Confidence
Before Management	Minor	Long-term (<5yrs)	Regional	Medium	Possible	Medium	-	High
Management Measures Traffic conditions to be monitored annually, should traffic congestion increase, appropriate mitigation measures will need to be explored and implemented.								
After Management	Minor	Long-term (<5yrs)	Site/Local	Medium	Unlikely	Medium	-	High
Construction								
	Magnitude	Duration	Scale	Consequence	Probability	Significance	+-	Confidence
Before Management	Minor	Short-term (<18mnts)	Regional	Low	Possible	Medium	-	High
Management Measures Traffic conditions to be monitored annually, should traffic congestion increase, appropriate mitigation measures will need to be explored and implemented.								
After Management	Minor	Short-term (18mnts)	Regional	Low	Unlikely	Medium	-	Medium

17.4.2 Impact on Pedestrians and Cyclists

The increase in light and heavy vehicles generated by the proposed mining right activity at Lazalelihlohloko Mining and Projects (Pty) Ltd will have a medium impact on the existing road space available for pedestrians and cyclists. There is minimal pedestrian activity along the access roads leading to the proposed mining right area and minimal increase in new pedestrian activity is expected.

General workers are not highly paid and are generally in the bottom half of the low-income group. As such, the majority of the construction workers are likely to reside within a reasonable distance of the site and will commute to and from work using public transport (or site transport) from the surrounding residential areas and be dropped off at the proposed Lazalelihlohloko Mining and Projects (Pty) Ltd project access gate. Therefore, the volume of pedestrian activity along the external road is not expected to increase.

17.4.3 Impact on Road Safety Conditions

The increase in traffic generated by the proposed Lazalelihlohloko Mining and Projects (Pty) Ltd project activities is not expected to have a major impact on the prevailing road safety conditions on the surrounding road network. There will however be an increase in vehicle traffic flows on the surrounding road network and vehicles have been identified as one of the major causes of accidents and incidents including fatalities on road networks. Whilst the responsibility for road safety on public roads is not that of the mining right, the project can implement measures to reduce the frustration experienced by the motoring public on these roads.

It is expected that the majority of the workers will use public transport and the proposed development of the project can be supported from a traffic flow point of view with provision be made on site to accommodate the safe loading and off-loading of staff using public transport as well as an in-house traffic management plan.

Analyses of existing traffic conditions on the road network surrounding the proposed residential development showed that generally the traffic conditions during typical weekday AM and PM peak hours are good with truly little congestion during peak hours.

The analyses of the existing plus development generated traffic showed that the additional traffic generated by the proposed Coal Mining Right development will not have a major impact on the surrounding road network. The road network is currently operating well below its capacity. Therefore, the generated traffic volumes will easily be accommodated by the existing road network without reducing the levels of service on the surrounding road network and will have minimal effect on public transport or pedestrian activities in the area. We recommend one line to be added near the access point of the Coal Mining Right to ease the flow of traffic and not to be congested.

18 LOCATION

The mining right area is located on Portions (RE,1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) of the Farm Mooihoek 168 HT, Portions (RE,1, 2, 3, 4) of the farm Klipspruit 136 HT , farm Klipspruit 137 HT & Portion RE/1 , RE/2, 6, 10 , 11, 13, 14, 15, 16, 18, 23, 29, 30, 33 & 34 of the farm Klipspruit 138 HT , respectfully owned by the as also stated on the title deed results obtained from the deed search. The project area is located within the jurisdiction of the Mkhondo Local Municipality under the Piet Retief Magisterial District, Mpumalanga. The MRA is approximately 6071.950 hectares in extent and situated approximately 2.90 km Northwest of Piet Retief and approximately 14.49km North East of Dirkiesdorp. The site is accessible via the R543. The project area is surrounded by farmland, settlement, town and mines.

The project area is situated in a predominantly agricultural area. A quaternary catchment W51C & W51B is located within the mining boundary. The proposed Coal project will comprise various new structures (Table 36 & Figure 69).

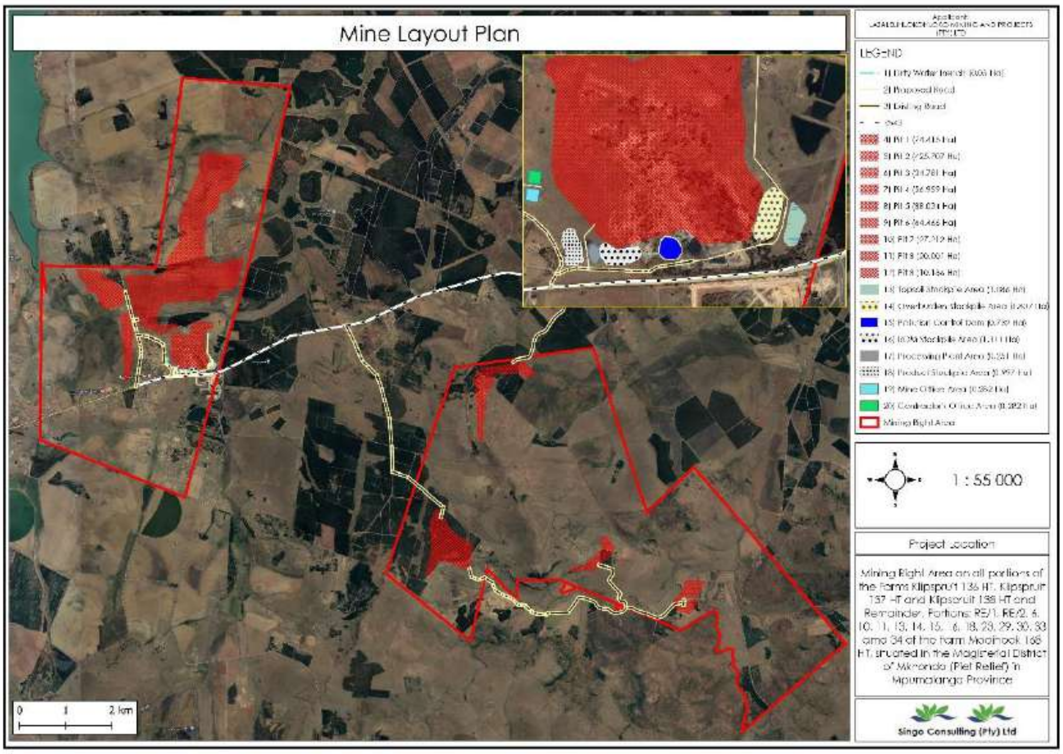


Figure 69: Mine layout plan.[Singo Consulting, 2022].

Table 36: Maximum space of the relevant proposed structures and activities

Description	Space (Ha)
PCD	0.732
Stockpile - RoM	1.111
Stockpile - product	1.111
Stockpile - Topsoil	1.086
Stockpile - OVB	1.087
Access road	0.8118
Workshop	Existing infrastructure
Offices	0.282
Crushing and screening area	0.251
Boxcut A	801.711

19 AGRICULTURAL STUDY

The agricultural assessment was not undertaken during; however the desktop assessment has been discussed in this section below.

19.1 Desktop assessment

As a part of the desktop assessment, soil basic data and the climatic information of the area were obtained. The soil identified during the desktop assessment are freely drained structureless soil (see **Figure 70**).

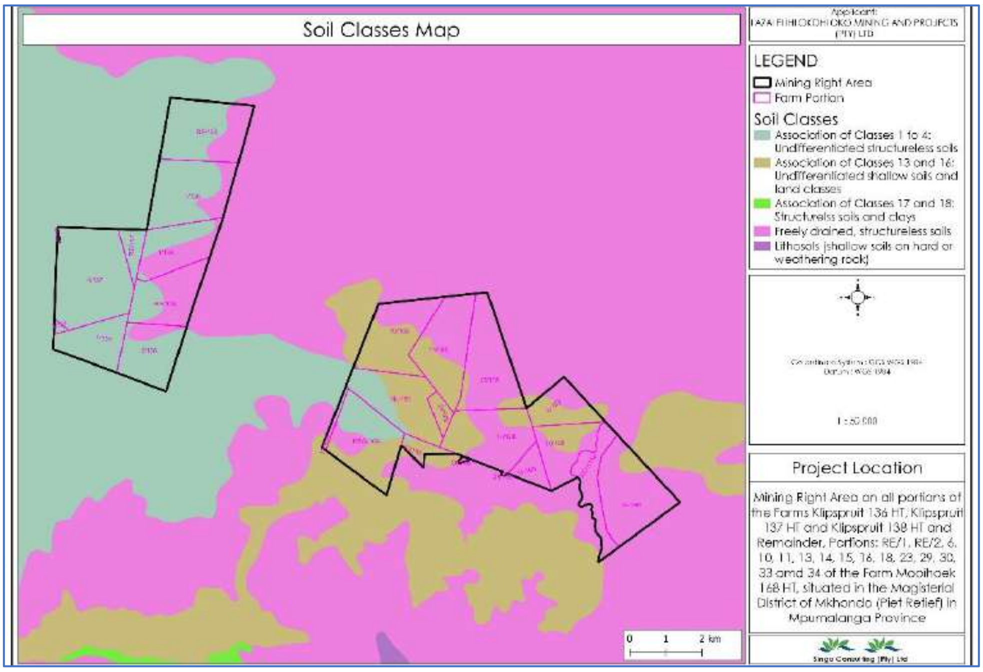


Figure 70: Soil classes Map of the proposed MRA. [Singo Consulting,2022].

According to the screening report conducted, the proposed project area is very high of agricultural sensitivity with features including the Pivot irrigation; land capability; 09. Moderate – high/10. Moderate-high as well as Pivot irrigation; land capability; 06. Low-moderate/07. Low-moderate/08. Moderate. The farming type map of the project area shows that the area is dominated by the grains type of farming. See

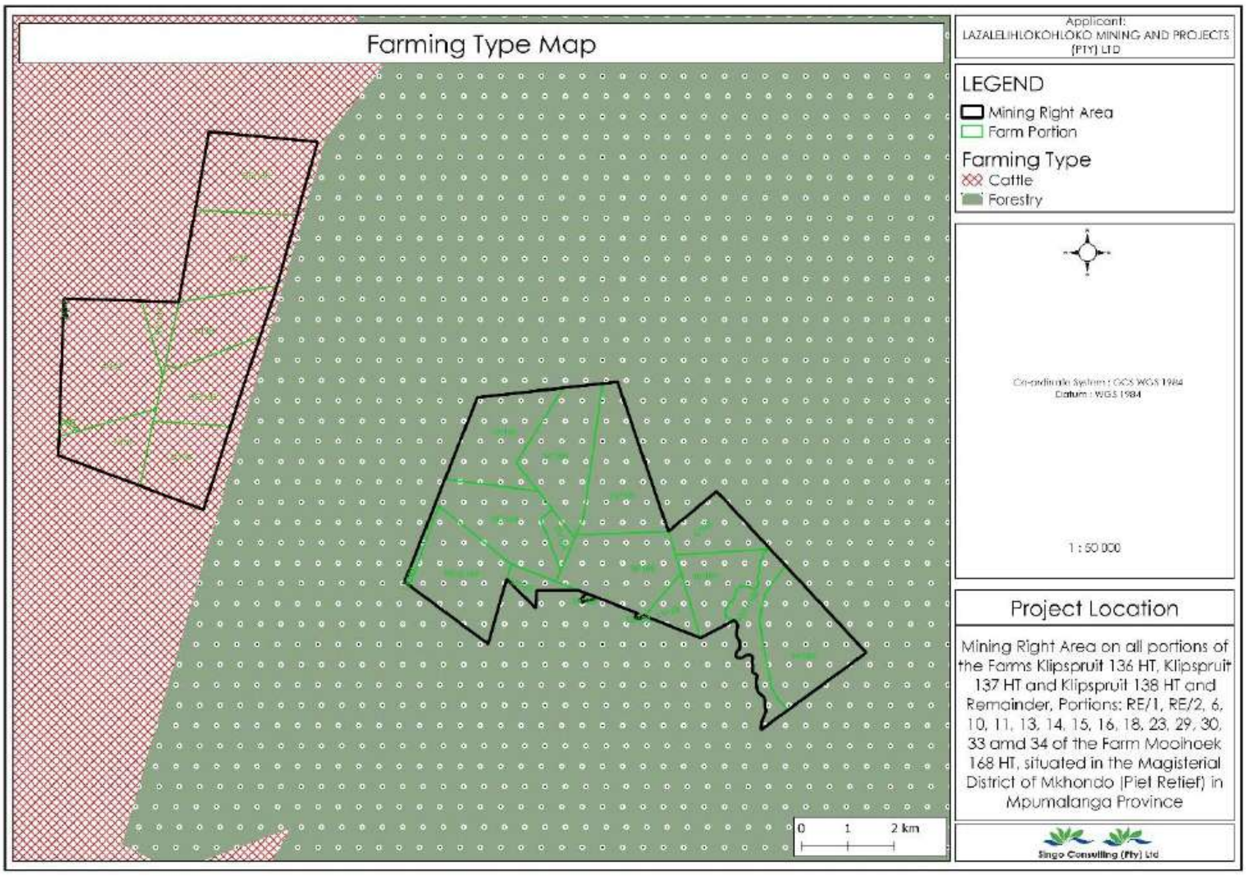


Figure 71: Farming type map of the MRA. [Singo Consulting,2022].

19.2 Current land use

Land use was identified using aerial imagery, then ground-truthed while out in the field. The surrounding land uses are associated with cultivation, livestock farming, Built up, wetlands, plantation & natural vegetation.

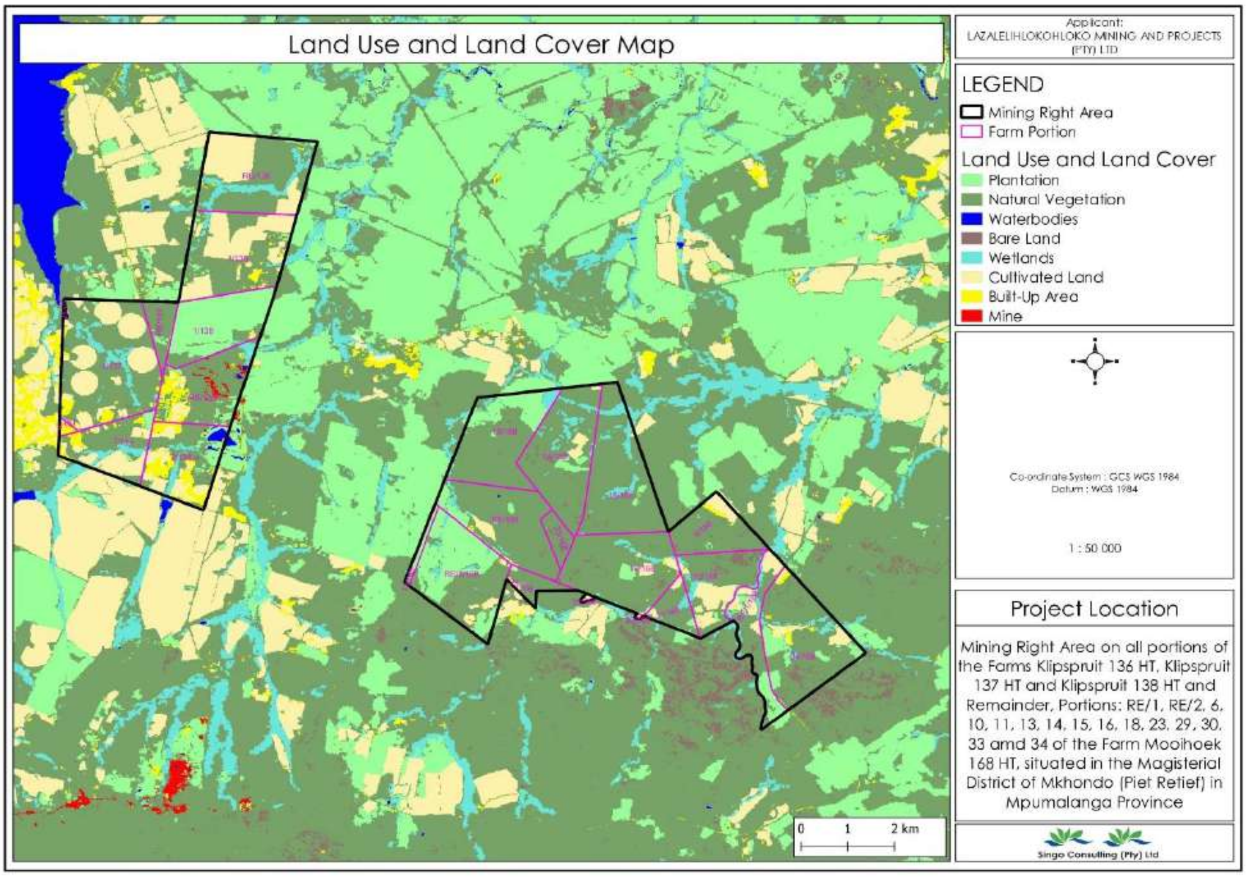


Figure 72: Land use and land cover map of the project area.[Singo Consulting,2022].

20 SOIL STUDY

The soil study assessment was undertaken by Singo Consulting (Pty) Ltd on the 02nd of May 2019.

20.1 Potential impacts on soil

20.1.1 Construction phase

During the construction phase of the above listed mining activities, the work carried out will mainly be the construction of the beneficiation plants and associated infrastructure, and expansion of stock yard and stockpiles.

This will entail the clearing of areas and the disturbance of the topsoil through excavations as well as the construction of a soil stockpile. The topography and natural drainage lines may also be disturbed. The overall impact will be loss of topsoil because of erosion and possible contamination of the soil by coal dust, fuel and oils (hydrocarbons) as a result of general construction activities. Soil compaction caused by heavy vehicles and machinery may also be a problem.

20.1.2 Operational phase

Soil erosion through wind and storm water run-off and soil pollution by means of hydrocarbon contamination and potentially coal dust may be encountered during the operational phase. Water runoff from roads and plant areas must be controlled and managed by means of proper storm water management facilities in order to prevent soil erosion. Diesel and oil spills are common at mine sites due to the large volumes of diesel and oil consumed by construction vehicles. Pollution may however be localized. Small pockets of localized pollution may be cleared up easily using commercially available hydrocarbon emergency clean-up kits.

An additional impact that could occur is when soils are stripped and stockpiled as the natural sequence of the soil horizons is lost when stripping and stockpiling is undertaken. An associated impact could be compaction of soil stockpiles, if they are repeatedly driven over, which would result in compaction of soil stockpiles if the appropriate dumping techniques were not adopted. This can be mitigated against by demarcating soil stockpiles and minimise or prevent driving over stockpiles should be avoided were possible to avoid compaction. End tipping as a method of creating stockpiles can be adopted to avoid unnecessary compaction.

20.1.3 Decommissioning phase

Mining infrastructure must be removed during the deconstruction phase. All foundation excavations must be backfilled and then covered with subsoil material and topsoil on the top layer, fertilised and re-vegetated. Backfilling of soil will impact on the land capability by restoring the land capability because vegetation can be supported and therefore returned to its original land use. As open cast mining progresses and enough space is available concurrent rehabilitation should be undertaken, this would include backfilling, contouring, re-vegetation of impacted areas and this would typically be done during the operational phase, as concurrent rehabilitation, and during the decommissioning phase.

21 HYDROGEOLOGY STUDY

The hydrogeological assessment was undertaken by Singo Consulting (Pty) Ltd during ground truthing on the 5th of May 2019.

21.1.1 Construction phase

The establishment of hard paved areas during infrastructure construction and haul road construction reduces the recharge of aquifers due to increased runoff. The establishment of the opencast areas is expected to have a negative effect on the surrounding aquifers within the immediate area which can cause lowering of water levels on neighbouring boreholes.

The operation of the fuel and lubricants storage facility has the potential for causing contamination of surface water due to infrastructure failure (emergency), leakage or spillages during normal operation. Included in normal operation is the potential for the incorrect disposal of spill absorbing material.

The operation of offices, ablutions and maintenance workshops has the potential for the contamination of groundwater due to incorrect disposal of domestic and hazardous wastes, incorrect handling of workshop effluent spills and leaks. The use of nitrate-based explosives during blasting for the establishment of the opencast areas has the potential to cause surface water pollution due to the addition of nitrates to water.

21.1.2 Operational phase

The establishment of hard paved areas during infrastructure construction and haul road construction reduces the recharge of aquifers due to increased runoff. The removal of vegetation during topsoil and overburden pre-stripping for haul road construction reduces the recharge of rainwater to aquifers due to increased run-off. Mining of the opencast areas has the effect of dewatering adjacent aquifers or lowering the water table.

The spillage of ammonium nitrate-based explosives during charging of holes, misfires and incomplete combustion of explosives may lead to an increase in nitrate levels in groundwater. The operation of the fuel and lubricants storage facility has the potential for causing contamination of groundwater due to either an infrastructure failure (emergency) or spillages during normal operation. Included in normal operation is the potential for the incorrect disposal of spill absorbing material.

AMD formation from spoil piles, exposed shale and backfilled spoils and discard in rehabilitated areas will affect groundwater quality through the acidification of groundwater and the leaching of salts and heavy metals from rock. Depending on the buffering capacity of the host rock, AMD will either result in the formation of low pH, high dissolved salt and heavy metal content water (insufficient buffering capacity) or the formation of neutral pH, high salt (including sodium) water, if high buffering capacity exists.

Polluted groundwater generated in the opencast areas are not connected to any underground mining areas and will not form part of the inter mine flow.

21.1.3 Decommissioning phase

The quality of groundwater will be impacted upon by mining. The mining area might produce a seepage zone or decant as the recharge to opencast workings have increased by the disturbance of the strata. There are no large-scale groundwater users in the area but poor-quality groundwater emerging as seeps into the surface water environment can be seen as a negative, long-term impact.

21.2 Post-mining operation

The long-term water quality impact for mining is the generation of AMD water. Opencast pits must be rehabilitated in such a way that recharge to the backfilled pit areas is limited to an absolute minimum. This would include shaping to allow surface water to drain away from the opencast pit areas, compaction of materials, suitable soil cover and vegetation of the rehabilitated areas to intercept recharge. In the opencast areas water levels will rise until the decant level is reached. Water quality in the opencast pits is not expected to be suitable for use and these areas will be sterilised in terms of available groundwater quantity.

22 GEOHYDROLOGICAL IMPACTS

The following major groundwater impacts are expected during the LoM.

Dewatering (water users in close proximity or downstream user): Analytical solutions and readily-available groundwater data of the Mpumalanga coalfields were used to calculate the possible drawdown after one year of opencast mining. The result of this is indicative and might vary slightly in reality. A radius of influence of approximately 500 m was derived from this method using generic existing hydraulic conductivity and storativity values. This could have associated impacts on adjacent water users.

Post-mining water management (flooding decanting and downstream impacts): High recharge values are expected through the back-filled areas and high hydraulic conductivity values can be expected from the spoils and waste rock. Surface and coal seam elevations indicate three possible decant points on-site, thus appropriate mitigation measures will have to be put in place to manage the water after mine closure. AMD could impact the water quality, while potentially negatively impacting receiving water users. More in-depth studies will have to be performed during the operational phase to determine the geochemical characteristics of the groundwater during and after mining.

Table 37: Impact assessment and mitigation measures.

Severity of impact	RATING	Spatial scope of impact	RATING	Duration of Impact	RATING	Frequency of Activity	RATING	Frequency of Impact	RATING
Insignificant/ non-harmful	1	Activity specific	1	1 day to 1 month	1	Annually or less/ low 6	1	Almost never/ almost impossible	1
Small / potential harmful	2	Mine specific (within the mine boundary)	2	1 month to 1 year	2	Monthly/temporary	2	Very seldom/ highly unlikely	2
Significant/ Slightly harmful	3	Local area (within 5km of the mine boundary)	3	1 year to 10 years	3	Monthly/ Infrequent	3	Infrequent/ unlikely/ seldom	3
harmful	4	Regional	4	Operational life	4	Weekly/life of operation/regularly/likely	4	Often/ regularly/ likely/ possible	4
extremely harmful	5	National	5	Post-closure/ Permanent	5	Daily/ permanent/high	5	Daily/ highly likely/ definitely	5

The environmental significance is derived from the below mentioned variables:

- Severity (Magnitude) of impact (M)
- Spatial scope (S)
- Duration of impact (D)
- Frequency of activity (Fa)
- Frequency of impact (Fi)

Environmental significance = (severity of impact +spatial scope + duration of scope) X (frequency of activity +frequency of impact)

- SP= (M+S+D) x (FA+ FI)

Table 38: Significance rating matrix

(Severity(M) + Spatial scope(S) + Duration(D))

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table 39: Impact assessment and mitigation measures

23 BLASTING IMPACT ASSESSMET REPORT

Brief desktop Blast Impact Assessment Report was conducted in house & refer to **Appendix 8** for a detailed report.

23.1 Use of explosives

Blasting activities that result in safety impacts typically relate to accidental explosion and poor coordination and communication of blasting activities. The following practices are recommended:

- Using, handling and transporting explosives in accordance with local and/or national explosives safety regulations.
- Assigning certified blasters or explosives experts to conduct blasts.
- Actively managing blasting activities in terms of loading, priming and firing explosives,
- drilling near explosives, misfired shots and disposal.
- Adoption of consistent blasting schedules, minimising blast-time changes.
- Specific warning devices (e.g. horn signals, flashing lights) and procedures should be implemented before each blasting activity to alert workers and third parties in surrounding areas (e.g. the community). Warning procedures may include traffic limitation on local roads and railways.
- Specific personnel training on explosives handling and safety management should be conducted.
- Blasting-permit procedures should be implemented for all personnel involved with explosives (handling, transport, storage, charging, blasting, and destruction of unused or surplus explosives).
- Blasting sites should be checked post-blast by qualified personnel for malfunctions and unexploded blasting agents, prior to resumption of work.
- Specific audited procedures should be implemented for all activities related to explosives (handling, transport, storage, charging, blasting and destruction of unused or surplus explosives) in accordance with relevant national or internationally recognised fire and safety codes.
- Qualified security personnel must control transport, storage and use of explosives on-site.

There are some limitations that should be considered when planning for blasting activity.

Table 40: Speed limits per environmental and manmade features.

Feature/Material	Vibration speed limit
National roads/tar roads	150mm/s
Steel pipelines	50mm/s
Electrical lines (Eskom)	75mm/s
Sasol Pipelines	25mms/s
Railways	150mm/s
Concrete less than 3 days old 1	5mm/s
Concrete after 10 days	200mm/s

Feature/Material	Vibration speed limit
Sensitive plant equipment: or 2	12mm/s or 25mm/s, depending on type (some switches could trip at levels of less than 25mm/s)
Waterwells or boreholes	50mm/s

23.2 Impact of vibration on the communities

Ground vibration and air blast will impact people. This includes various impacts on structures, even at low levels. People may experience ground vibration at very low levels, which are well below damage capability for most structures. Much work has been done in public relations in the mining industry. This includes the promotion of good neighborship by effectively communicating with neighbours and addressing their concerns.

The first level of good practice is to avoid unnecessary problems. One problem that can be reduced is the public's reaction to blasting. Concern for a person's home could be reduced by a scheme of precautionary, compensatory and other measures that offer guaranteed remedies without undue argument or excuse. In general, it is also in an operator's financial interests not to blast where there is a viable alternative. Where blasting can be avoided, perhaps through new technology, it must be carefully considered in the light of environmental pressures. Historical precedent may not be a helpful guide in such cases.

Independent structural surveys are one way of building a good relationship with neighbours. Since changes that occur in crack patterns may be misunderstood, surveys may not be an effective solution in this case. Cracks open and close with seasonal changes of temperature, humidity and drainage, and numbers increase as buildings age. Additional actions need to be taken to supplement such surveys. Ground vibration, overpressure and fly rock control measures may be of better use in this case.

Many of the fly rock control measures aid cost-effective production. These measures include:

- Correct blast design, which is essential and should include a survey of the face profile prior to design, ensuring appropriate burden to avoid over-confinement of charges which may increase vibration by a factor of two.
- The setting-out and drilling of blasts should be as accurate as possible and the drilled holes should be surveyed for deviation along their lengths and, if necessary, the blast design must be adjusted.
- Correct charging; if free poured bulk explosives are used, its rise during loading should be checked. This is especially important in fragmented ground to avoid accidental overcharging.
- Correct stemming will help control air blast and fly rock and will aid in the control of ground vibration. Controlling the length of the stemming column is important; too short and premature ejection occurs, too long and there can be excessive confinement and poor fragmentation. The length of the stemming column depends on the hole diameter and the type of material used.
- Monitoring of blasting and re-optimising of the blasting design in the light of results obtained, changing conditions and experience should be carried out as standard.

A house could develop up to fifteen cracks a year and may subsequently be devaluated. Ground vibration can cause cracks in structures if it is strong enough and occurs at continued high levels. Environmental forces like temperature, water and wind contribute to cracks developing in structures. Visual proof of actual damage due to blasting operations are limited.

24 REHABILITATION STUDY

The rehabilitation study was undertaken for this proposed project and its included in the report .

24.1 Conceptual rehabilitation plan

Rehabilitation of the proposed project for Lazalelihlohloko Mining and Projects (Pty) Ltd is a continuous and timeframe operation. To gain the best possible rehabilitation outcomes from the mining processes in the relatively sensitive area, different actions are required at different times in the LoM, from prospecting to closure. Similarly, there are management and monitoring actions that will be required throughout the LoM and for years after the project has been closed. Traditional mining phases include construction, operation and closure. Prior to construction and preparation of the land for mining, best practices must be implemented and compliance to legislation must be adhered to. The proposed project is no exception. See Table 41 for actions that must occur during the four phases to ensure successful rehabilitation.

Table 41: Actions to occur through the life of mine (summary)

Land preparation phase	• Clearing of vegetation • Soil strip and store with vegetation • Rehab soil stockpiles • Maintain and monitor soil
Construction phase	• Construction of mining surface infrastructure • Drilling, blasting and development of infrastructure and adits for mining • Temporary storage of hazardous products and waste • Monitoring of construction activities and sensitive areas
Mining operation phase	• Use and maintenance of roads and infrastructure • Removal of overburden and ore and backfilling when possible, and stockpiling • Water use and storage onsite • Storage, handling and treatment of hazardous products and waste • Concurrent rehabilitation by replacement of overburden, subsoil and topsoil and revegetation as mining progresses • Environmental monitoring
Decommission and closure	• Demolition and removal of all mine infrastructure • Storage, handling and treatment of hazardous products and waste • Maintenance and monitoring of all rehab areas • Rehabilitation: Replacement of topsoil and subsoil, revegetation and profiling • Water channels and pollution control

25 AIR QUALITY

An air quality assessment was not conducted for the proposed project.

25.1 Background

25.1.1 Regional air quality

South Africa is located in the sub-tropics where high pressures and subsidence dominate. However, the southern part of the continent can serve as a source of hot air that intrudes sub-tropics, and that sometimes lead to convective movement of air masses. On average, a low pressure will develop over the southern part of the continent, while the normal high pressures will remain over the surrounding oceans. These high pressures are known as Indian High-Pressure Cells and Atlantic High-pressure Cells. The intrusion of continents will allow for the development of circulation patterns that draw moisture (rain) from either tropics (hot air masses over equator) or from the mid-latitude and temperate latitudes.

Southern Africa is influenced by two major high-pressure cells, in addition to various circulation systems prevailing in the adjacent tropical and temperate latitudes. The mean circulation of the atmosphere over Southern Africa is anti-cyclonic throughout the year (except near the surface) due to the dominance of the three high pressure cells, namely South Atlantic High Pressure (off the west coast), the South Indian High Pressure (off the east coast) and the Continental High Pressure (over the interior).

25.1.2 Climate

Piet Retief is 1251m above sea level. The city has a Subtropical highland climate. The climate in Piet Retief is warm and temperate and the Köppen-Geiger climate classification is Cwb. The average annual temperature in Piet Retief is 16.1 °C. According to **Figure 73**, the mean annual rainfall is between 601 - 800 mm. The approximate rainfall can be around 706.1 mm. The driest month is June with a rainfall of 3.4 mm. January has the most precipitation with an average of 125 mm and has an average of 20.8 °C which would the warmest month. June has lowest average temperature of the year which is 9.5 °C. The month with the least precipitation on average is July with an average of 5.1 mm.

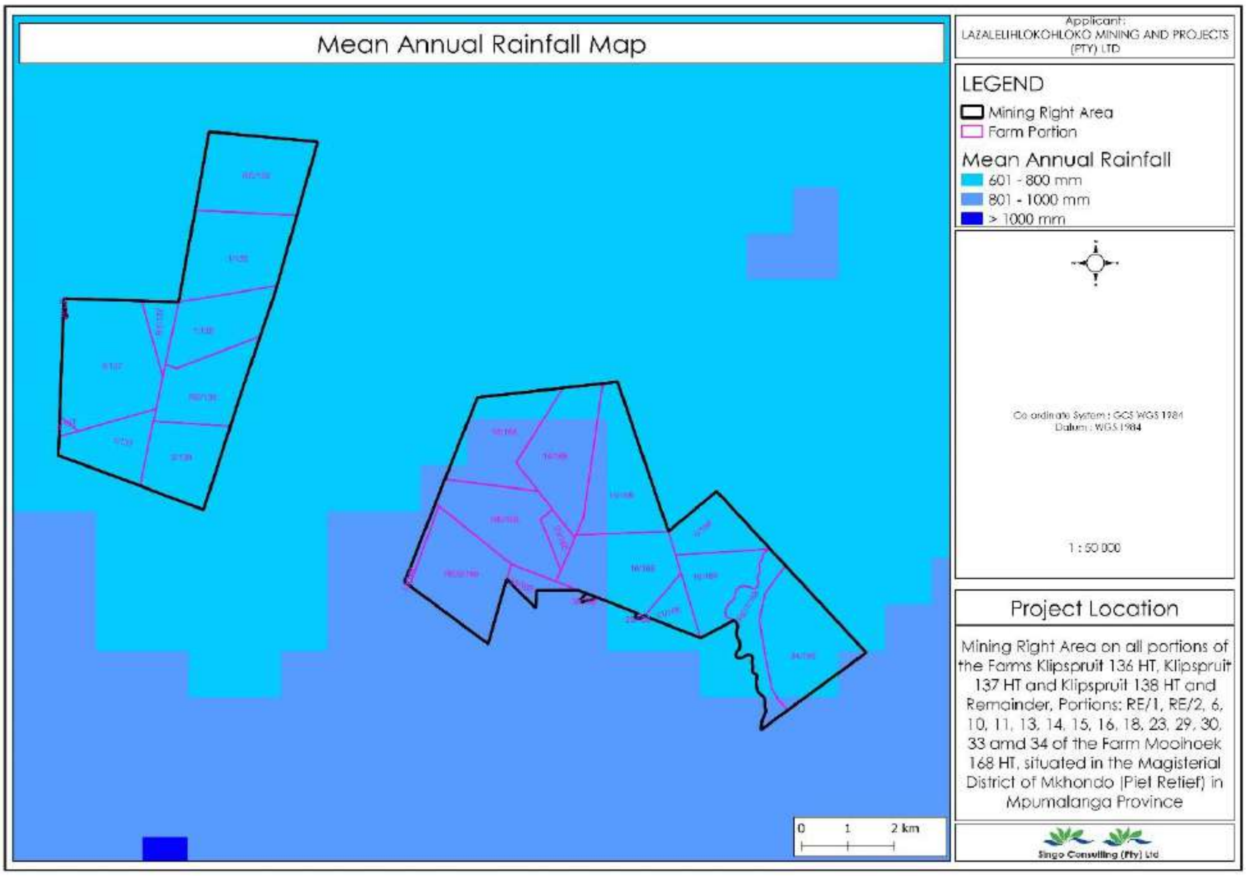


Figure 73: Mean annual rainfall map. [Singo Consulting,2022].

25.2 Sensitive receptors

The following sensitivity receptors have been identified in the immediate vicinity of the study area and proposed project area:

- Farm steads
- Residential areas
- Wetland
- Plantation
- Cultivated land

25.2.1 Vehicle exhaust gases

Vehicle exhausts contain several pollutants, including carbon dioxide (CO_2), carbon monoxide (CO), hydrocarbons, oxides of nitrogen (NO_x), sulphur and PM-10. Tiny amounts of poisonous trace elements like lead, cadmium and nickel are also present. The quantity of each pollutant emitted depends on the type and quantity of fuel used, engine size, speed of the vehicle and abatement equipment fitted. Once emitted, the pollutants are diluted and dispersed in the ambient air. Pollutant concentrations in the air can be measured or modelled and then compared with ambient air quality criteria.

25.2.2 Veld fires

Veld fires are widespread across the world, occurring in autumn, winter and early spring. In addition to controlled burning for fire-breaks and veld management, many fires are set deliberately. Some are accidental, like those started by motorists throwing cigarettes out of car windows. Emissions from veld fires are similar to those generated by coal and wood combustion. Veld fire smoke primarily impacts visibility and landscape aesthetic quality, but also contributes to the degradation of regional scale air quality. Dry combustible material is consumed first when a fire starts. Surrounding live, green material is dried by the large amount of heat that is released when there are veld fires; sometimes this material also burn. The major pollutants from veld fires are particulate matter, carbon monoxide, and volatile organics. Nitrogen oxides are emitted at rates from 1 to 4 g/kg burned, depending on combustion temperatures. Emissions of sulphur oxides are negligible (USEPA, 1996).

25.2.3 Trucks passing on the gravel road, loading and offloading raw materials

Dust emissions occur when soil is crushed by a vehicle, due to low soil moisture content. Vehicles used on the roads will generate PM-10 emissions throughout the area and they carry soils onto the paved roads which would increase entrainment PM-10 emissions. The quantity of dust emissions from unpaved roads varies linearly with the volume of traffic.

25.2.4 Wind erosion as a result of RoM material and topsoil stockpiles

The topsoil and waste rock stockpiles generated during the construction phase will be minimal and probably used for construction purposes on-site (berm and foundations for buildings), since it will be limited to the mining areas, as the project is mainly an open cast operation. At the RoM stockpile, there will be constant transfer of ore from the open cast to the stockpile and then to the crushing/screening plant.

25.2.5 Material handling (loading, hauling and tipping)

Material handling during loading, hauling and tipping has been known to influence dust generation in terms of increasing the fugitive dust emissions being generated. With the different kind of materials – topsoil, soft and hard, tipping will be negligible. The tipping is mostly associated with the RoM at the processing plant vicinity. During these activities, factors like the surrounding wind regime, material tipping rate, and the moisture content of the material all influence dust generation at the tipping transfer points.

25.2.6 Plant (crushing and screening)

There are two basic crushing methods: compressive or impact. The main types in these categories are:

- Compressive: Jaw crushers, single and double toggles, gyratory crushers, cone crushers, roll crushers, ball mills and rod mills.
- Impact: Rotary or vertical shaft impactors (e.g. Barmac), hammer mills (fixed or swing hammers).

Compressive crushing produces dust, but not a great deal of air movement. The material passing through the crusher results in the dust and processed material becoming airborne. Excessive clearance under the crusher can cause a lot of dust generation in the same way as a high discharge point. Impact-type crushers, e.g. hammer mills, act as powerful fans and not only produce dust from the impact of hammer on rock, but also blow the dust out.

Screening, particularly dry screening, presents the most difficult dust control problem. Screen layout must be carefully planned to remove the fine cut as early as possible to reduce the dust carried through the screening process. It must also allow for the use of water to clean chip and allay dust, as water is the cheapest form of dust suppression. In most cases, the crushing and screening process is a significant source of fugitive dust with high quantities of respirable fractions released into the atmosphere. Dust sources around the plant, apart from crushing and screening, include discharge into hoppers and long open chutes, and movement from conveyors and transfer points. High discharge heights produce an air pressure blast effect and create turbulence, which carries dust into the air. This causes particle fracture and free fall allows the wind to pick up and carry the dust for a long distance from the discharge point.

25.2.7 Generalised site impacts

The main impacting sources are dust generated from road transport, while a secondary impacting source is wind-blown dust from exposed surfaces. Specific mitigation measures must be included in the mine design. For instance, primary crushing and screening chemical dust suppression systems are proposed, and for secondary and tertiary crushing and screening, dust extraction systems comprising of wet scrubbers are proposed.

An operational water truck should effectively suppress dust on unpaved access roads. Control techniques for fugitive dust sources generally include watering, chemical stabilisation and the reduction of surface wind speed though the use of windbreaks and source enclosures. Watering represents a commonly used, relatively inexpensive option, but provides only temporary dust control. Although the chemical treatment of exposed surfaces is more expensive, it provides for longer dust suppression. The use of chemicals may, however, have adverse effects on the receiving biophysical environment if not carefully selected. The construction of windbreaks and source enclosures are not always practical due to the size of many fugitive dust sources (Cowherd et al., 1988; EPA, 1996).

Preventative measures aimed at the reduction of the source extent, or process modifications and adjusted work practices, may reduce fugitive emissions. Measures aimed at reducing the extent of the source of fugitive dust include: the reduction in the mass of material being handled, the elimination of track-on on paved roads, and the paving of unpaved roads. Track-on refers to the material carried onto the paved road by vehicles from the unpaved shoulders of paved roads and from adjoining unpaved roads.

Mitigation measures entail the periodic removal of deposited material to reduce dust generation. Examples of mitigation control measures include spillage clean-up on paved roads (broom and vacuum sweeping) and at conveyor transfer points (Cowherd et al., 1988; EPA, 1996). Measures aimed at preventing the deposition of materials onto the surface should be prioritised above cleaning of deposited material.

25.2.8 Unpaved/gravel roads dust control

The access roads on-site were identified as the second-most significant source of dust emissions. The following measures may be taken to reduce emissions from unpaved roads:

- Measures aimed at reducing the extent of unpaved roads, e.g. paving
- Traffic control measures aimed at reducing the entrainment of material by restricting traffic volumes and reducing vehicle speeds
- Measures aimed at binding the surface material or enhancing moisture retention, like wet suppression and chemical stabilisation (EPA, 1987; Cowhert et al., 1988; APCD, 1995).

Since unsurfaced roads must be watered, control efficiencies which may be achieved through wet suppression were investigated. In addition, the reduction in vehicle entrainment due to reduced vehicle kilometres travelled is also included.

Permanent improvements in travel surfaces, like the paving of a road, results in continuous control efficiencies. The control efficiencies obtained by wet suppression and the use of chemical stabilisers are, however, cyclic rather than continuous by nature as indicated previously. The efficiency afforded by the application of water or chemicals decay over time, requiring periodic reapplication to maintain the desired average efficiency.

25.2.9 Climate change

During a 2016 assessment of South Africa's coal mining sector's response to climate change adaption demands (undertaken by B. Chavalala from UNISA), climate change adaptation has received limited attention compared to mitigation across all spatial levels. This is apart from the documented adverse impacts of climate change in different sectors of societies, including mining in general and coal mining specifically. Against this background, the study set three objectives. The first objective was to identify current and possible future climate change impacts that may affect selected coal mines in South Africa. The second objective was to establish the nature and extent to which these mines were ready to address and implement adaptation measures. The final objective was to determine and document existing climate change adaptation practices in selected mines. Employing the mixed methods approach, the research engaged five coal mines located in Mpumalanga, the Free State and KwaZulu-Natal, gathering both qualitative and quantitative data. This data was analysed thematically.

The research made three major findings. The first finding was that the climatic conditions in the research areas have been changing over the observed period. In general, rainfall has been declining and temperatures have been increasing, leading to increased cases of extreme fog, mist and heatwaves. The second finding was that there has been an increase in frequency and intensity of extreme weather events, most notably floods and droughts. These climate changes and associated weather events have frequently affected mine operations, particularly at the production sub-chain of the coal mining value chain. The third major finding was that, despite evidence of adverse impacts on climate change on the production sub-chain of the South African coal mining value chain, adaption responses in all the studied mines showed reactive adaptation to extreme events instead of proactive adaptation planning and implementation. South Africa depends on coal-derived energy, electricity in particular and the coal mines are implicitly exposed and vulnerable to the adverse impacts of climate change. Reducing this exposure and vulnerability requires urgent implementation of anticipatory adaptation measures in all the sub-chains of the coal mining value chain.

Coal is the world's most abundant and widely distributed fossil fuel source and will remain so well into the future. At present, approximately 23% of primary global energy needs are met by coal and 40% of electricity is generated from coal. About 70% of world steel production depends on coal feedstock. Coal combustion is the largest contributor to the human-made increase in CO_2 in the atmosphere. Electric generation through coal burning produces about twice the greenhouse gasses per kilowatt compared to generation using natural gas.

Coal mining releases methane, a potent greenhouse gas. Methane is the naturally-occurring product of organic matter decay as coal deposits are formed with increasing depths of burial, rising temperatures, and rising pressure over geological time. A portion of the methane produced is absorbed by the coal and later released from the coal seam (and surrounding disturbed strata) during the mining process. Methane accounts for 10.5% of greenhouse-gas emissions created through human activity. According to the Intergovernmental Panel on Climate Change, methane's global warming potential is 21 times greater than that of carbon dioxide (over a 100-year timeline). The mining process can release pockets of methane, which pose a threat to coal miners and cause air pollution. This is due to the relaxation of pressure and fracturing of the strata during mining activity, which gives rise to safety concerns for the coal miners if not managed properly. The pressure build-up in the strata can lead to explosions during (or after) the mining process if preventative measures like methane draining are not taken.

In 2008, James E. Hansen and Pushker Kharecha published a peer-reviewed scientific study analysing the effect of a coal phase-out on atmospheric CO_2 levels. Their baseline mitigation scenario was a phase-out of global coal emissions by 2050. Under the Business-as-Usual scenario, atmospheric CO_2 peaks at 563 parts per million (ppm) in the year 2100. Under the four coal phase-out scenarios, atmospheric CO_2 peaks at 422–446 ppm between 2045 and 2060 and declines thereafter.

Climate change is unlikely to have a major direct impact on the mining industry, for which regulations and management strategies are already in place to manage water usage, water conservation and demand strategies and environmental issues relating to rehabilitation and the provision of rehabilitation guarantees. While a lack of access to water may affect some mining projects, most mining processes do not generally require potable water. Where high-quality water is required, some mines are already installing water treatment units.

Changes in the frequency and intensity of storm events have the potential to impact mining operations (e.g. tailing dams, sediment and erosion control). These impacts can, however, normally be addressed as part of the mine's storm water management plan.

The highest risk to the mining industry from climate change is most likely to come from meeting growing community concerns over environmental issues. This is likely to increase the difficultly in obtaining approvals for mining projects (particularly for coal). Additional constraints on mining may affect the economic viability of individual mines, leading to flow-on effects to communities, through job losses and a decline in regional revenue. Work to develop clean coal technologies may ameliorate this risk to some extent, however, the actual mining process is likely to face increasing community pressure.

Clean coal technologies limited to the mining operations and end users will be a key factor in adapting to climate change and a carbon-constrained future. Such technologies include:

- Pre and post-carbon capture and storage technologies
- New pollution control devices, like advanced scrubbers, that clean pollutants from flue gases before they exit a plant's smokestack
- Chemical looping combustion technology to concentrate CO_2 levels in exhaust
- Production of ultra clean coal reduces ash from the coal allowing it to be directly fired in gas turbines at higher efficiency and lower greenhouse gas emissions
- Efficiency upgrades and co-firing with less greenhouse intensive fuels in coal-fired power stations
- Low – NO_x burners that allow coal-fired plants to reduce nitrogen oxide emissions
- High temperature solar thermal applications integrated into coal-fired power generation
- Stack gas treatment – Applied to gaseous emissions from Pulverised Fuel (PF) Combustion
- Advanced Pulverised Fuel Combustion (PF)
- Fluidised Bed Combustion (FBC)
- Gasification and Integrated Coal Gasification Combined Cycle Systems
- Hybrid and advanced systems
- Fuel cell technologies utilising gas from coal
- Oxy-firing technology to raise the concentration of CO_2 in flue gases to better enable its capture
- Coal gasification, including underground gasification in situ
- Capture and utilisation of fugitive emissions from coal mines

26 WASTE CLASSIFICATION

The IWWMP was undertaken for the proposed project.

Several waste types are defined in Schedule 3 of the Waste Amendment Act 26 of 2014 as Category A (Hazardous waste) or Category B (General waste). In terms of mine residue waste (included under Schedule 3), Category A:

- Residue deposits" means any residue stockpile remaining at the termination, cancellation, or expiry of a prospecting right, mining right, mining permit, exploration right or production right.
- Residue stockpile" means any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, mineral processing plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated within the mining area for potential re-use, or which is disposed of, by the holder of a mining right, mining permit or, production right or an old order right, including historic mines and dumps created before the implementation of this Act. Hazardous wastes must be deposited in so-called secure landfills, which provide at least 3 metres of separation between the bottom of the landfill and the underlying bedrock or groundwater table. A secure hazardous-waste landfill must have two impermeable liners and leachate collection systems. The double leachate collection system consists of a network of 26 perforated pipes placed above each liner. The upper system prevents the accumulation of leachate trapped in the fill, and the lower serves as a backup. Collected leachate is pumped to a treatment plant. In order to reduce the amount of leachate in the fill and minimize the potential for environmental damage, an impermeable cap or cover is placed over a finished landfill.

- Hazardous wastes that are not destroyed by incineration or other chemical processes need to be disposed of properly. For most such wastes, land disposal is the ultimate destination, although it is not an attractive practice, because of the inherent environmental risks involved. Two basic methods of land disposal include landfilling and underground injection. Prior to land disposal, surface storage or containment systems are often employed as a temporary method.

  Category B: General waste :
  General waste means waste that does not pose an immediate hazard or threat to health or to the environment, and includes-
  a) domestic waste;
  b) building and demolition waste;
  c) business waste;
  d) inert waste;
  e) any waste classified as non-hazardous waste in terms of the regulations made under section 69, and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes.
  "inert waste" means waste that:
  a) Does not undergo any significant physical, chemical or biological transformation after disposal;

b) Does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact;

c) Does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant.

26.1 Recommendations

The following recommendations can be made:

- One other option for remediation is to completely remove all the waste material from the site and transport it to another location for treatment and proper disposal. This so-called off-site solution is usually the most expensive option. An alternative is on-site remediation, which reduces the production of leachate and lessens the chance of groundwater contamination. On-site remediation may include temporary removal of the hazardous waste, construction of a secure landfill on the same site, and proper replacement of the waste. It may also include treatment of any contaminated soil or groundwater. Treated soil may be replaced on-site and treated groundwater returned to the aquifer by deep-well injection.
- A less costly alternative is full containment of the waste. This is done by placing an impermeable cover over the hazardous-waste site and by blocking the lateral flow of groundwater with subsurface cut-offs walls. It is possible to use cut-off walls for this purpose when there is a natural layer of impervious soil or rock below the site. The walls are constructed around the perimeter of the site, deep enough to penetrate to the impervious layer. They can be excavated as trenches around the site without moving or disturbing the waste material. The trenches are filled with bentonite clay slurry to prevent their collapse during construction, and they are backfilled with a mixture of soil and cement that solidifies to form an impermeable barrier. Cut-off walls thus serve as vertical barriers to the flow of water, and the impervious layer serves as a barrier at the bottom.

- Shale, Sandstone and Sandstone were classified as type 3 waste, these stockpiles need to be lined with a class C lining. According to GNR 636: "Type 3 Waste may only be disposed of at a Class C landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a G: L: B+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (DWAF MR, 1998)".
- Therefore, a recommended lining system for this type of waste must be constructed in several steps using relevant materials like the geosynthetic clay liner, high-density polyethylene (HDPE) geomembrane liner, geo composite drainage layer, as well as gravel protective cover. If permeability < 1 x 10-7 cm/s cannot be reached with in-situ material, clay material (600mm) must be imported, or the in-situ material be enriched with bentonite (2 x 150mm layers) minimum 7% bentonite added, refer to Appendix C for examples.

27 IMPACTS AND RISKS IDENTIFIED, INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY

This section lists the potential impacts of the listed activities associated with the project, rates the significance of the identified potential impacts pre-mitigation and post-mitigation, and identified the probability and duration of the impacts. The potential impacts identified in this section are a result of the environment in which the project activity takes place, as well as the activity itself. The identification of potential impacts is performed by determining the potential source, possible pathways and receptors. In essence, the potential for any change to a resource or receptor brought about by the presence of a project component or by a project-related activity has been identified as a potential impact.

The potential impacts are discussed per environmental or socio-economic aspect and according to each phase of the project i.e. Construction, Operational and Decommissioning, and Rehabilitation.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Surface and groundwater		
Ground and surface water contamination	Negative	• Prevention of contaminated surface run-off, which might impact the water resource used by downstream users. • Hazardous chemicals must be stored in a bunded facility. • Handling of such chemicals must be undertaken on a non-permeable surface. • All hydrocarbons, lubricants and explosives must be adequately stored and bunded off to prevent groundwater contamination during an accidental spill. • All water that may collect in an area used for the storage of hydrocarbons must pass through an oil water separator before being discharged as dirty water. • Spillages on open soil must be contained, removed and treated as hazardous waste. • Emergency response plan to be put in place for spillages. • Storage facilities must be inspected regularly. • Implement effective concurrent rehabilitation of the open-cast pit area. • Long-term management of mine-affected water, including potential decant to form part of the mine's water management strategy.
Wetland/river/ hydrology/ geomorphology	Negative	• Mining across wetlands/rivers should be restricted to low-flow period (dry winter season) if possible. Ensure that mining activities are carefully monitored to limit unnecessary impacts to wetlands/riparian areas (particularly in-stream habitat).

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• Do not lower the original stream bed/profile of the wetland/river as this may result in scouring in an upstream direction and further alteration of bed conditions. • Ensure that coarse immovable material, including boulders and other rock in river channels, is not removed to ensure continued stability and functioning of the river systems. River sediments should not be permanently removed from the system in any case. • Limit activities occurring in the in-stream channel areas. • Under no circumstance should consideration be given to the excavation of an artificial channel or the damming of wetlands or rivers in such a manner as to totally restrict the flow. • Excavated material/sediments/spoil from the mining zone (including any foreign materials) should not be placed or stockpiled in wetlands or river channels, including the riparian zone of streams/rivers. • Any abstraction of water from rivers/wetlands for construction purposes must be approved by the Department of Water and Sanitation (DWS) by means of Water Use License (WUL).
Potential reduction of catchment yield of the aquifers through dewatering	Negative	• Regularly monitor groundwater levels as per the recommendations of the geohydrological report.
Excavated materials that are stockpiled in incorrect areas can interfere with the natural drainage, cause sedimentation and water pollution	Negative	• The areas excavated must have vegetated berms to separate dirty and clean water systems and serve as an erosion control measure. • The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams, and surface water resources. • Upslope diversion and down-slope silt containment structures should be constructed. • Surface water resources must be monitored pre-mining and during construction, as per the monitoring programme.
Displacement of flora and fauna species of conservation concern (SCC)	Negative	• SCC should be relocated or protected in situ, depending on the species in question and the decision of the CA. • Set aside areas allowing for continued existence of SCC. • Adjust proposed mine’s layout design to exclude sensitive areas. • Keep the footprint of the disturbed area to the minimum and in designated areas only. • An environmental induction for all staff members must be mandatory to discuss impacts like the presence of SCC, which may not be damaged, caught or removed without a permit.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Accidental introduction of alien species and invaders	Negative	• Eradication and/or control of alien invasive plants and weeds as per the alien and invasive species monitoring programme. • Avoid disturbance of natural areas as possible and control the spread of alien flora into natural areas. • Continuously monitor the growth and spread of alien and invasive flora, coupled with an adaptive management approach to identify suitable control mechanisms (e.g. mechanical, chemical or biological control). Mechanical control is usually preferred. • Clean vehicles and equipment before entering natural areas to remove large deposits of foreign soils and plant material.
Faunal mortalities	Negative	• Environmental induction for all staff members must be mandatory to discuss issues related to the killing and/or disturbance of faunal species, which should be avoided. • Several staff members must complete a snake-handling course to safely remove snakes from designated areas. • Road mortalities should be monitored by vehicle operators (for personal incidents only) and the ECO (all road kill on a periodic monitoring basis and specific incidents) with trends being monitored and reviewed as part of monthly reporting. Monitoring should occur via a logbook system where staff notes the date, time and location of the sighting/incident. This will allow determination of the locations where the greatest likelihood exists of causing road mortality and allow mitigation against it (e.g. fauna underpasses, and seasonal speed reductions). Mitigation must be adapted to the on-site situation which may vary over time. • All staff operating motor vehicles must undergo an environmental induction training course that includes instruction on the need to comply with speed limits, to respect all forms of wildlife (especially reptiles and amphibians) and, where possible, prevent accidental fauna road kills. Drivers not complying with speed limits should be subject to penalties. • The proposed prospecting activities will result in the deaths of numerous fauna species. It is suggested that construction and mining operations occur from a predetermined area and move along a gradient to allow fauna species to relocate. • The ECO must monitor live animal observations to detect trends in animal populations and implement proactive adaptable mitigation of vehicle movements. • Should holes or burrows be located on-site, contact a zoological specialist to investigate and possibly remove any species located in them. • Where possible, barriers around excavation sites must be erected to prevent fauna from falling into excavations.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• The area surrounding the bulk sampling operation must be demarcated and fenced-off to restrict animals from moving into the area, and to reduce fauna mortalities.
Vegetation and fauna management		• Keep the clearing of natural vegetation in wetland areas to a minimum and attempt to ensure that clearing occurs in parallel with the mining progress where possible. • Limit mining equipment operating in wetland/riparian areas to that needed to be cleared. • Temporary noise pollution due to mining works must be minimised in sensitive areas by ensuring proper maintenance of equipment and vehicles and tuning of engines and mufflers, as well as employing low-noise equipment where possible. • No wild animal may under any circumstance be hunted, snared, captured, injured, killed, harmed or removed from the site. This includes animals perceived to be vermin. • Any fauna that are found within the mining corridor should be moved to the closest point of natural or semi-natural vegetation outside the mining corridor. A specialist may need to be used for dangerous/venomous species such as snakes.
Geology and soils		
Land use change which will affect the soil and land use capability during construction and post-mining operations. Loss of agricultural soils and land expected.	Negative	• Should the No-Go alternative not be considered, mining activities must be located on low-medium agricultural potential land to minimise impacts. • Compensate landowners. • Rehabilitate areas disturbed by mining to return land to arable land where feasible. If not, other land uses (decommissioning phase) deemed socially, economically or environmentally applicable, must be considered.
Site clearance and levelling during the construction phase will create additional exposed areas and could trigger erosion and siltation, especially during rainy periods	Negative	• Prevent soil loss through erosion. • Develop appropriate storm water management system to control surface run-off over exposed areas. • Preserve soil fertility for later use. • Ensure all vehicles stay in the designated areas (for example, away from watercourses). • Plan to construct the majority of development during the dry winter months. • Establish temporary erosion and sedimentation trapping control measures during the construction phase
Storage of topsoil	Negative	• Remove and stockpile topsoil from roads, building platforms, stockpile and dam areas prior to construction. • Preserve topsoil and store in an appropriate manner to maintain viability and seed bank for future rehabilitation.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• Store away from watercourses to prevent sedimentation and erosion. • Protect from alien plant establishment.
Soils and sediment management	Negative	• Where possible, mining activities in rivers and wetlands must proceed during dry winter months (low or zero-flow periods) to limit the potential for erosion linked to high run-off rates. • All soil stockpiles must be placed in an up-slope direction from the trench so that that any surface wash is directed into the trench and not further down-slope. • Any erosion points created during mining activity construction must be filled and stabilised immediately. Stockpiles must be protected from erosion, stored on flat areas where possible, and surrounded by appropriate berms. • No stockpiling of soils or materials should take place in a watercourse, including wetlands and the riparian zone of streams/rivers. • Periodic visual inspections of on-site water quality, identifying the source of any rapid increases in turbidity of surface waters and remediation of this where necessary (by a qualified Environmental Officer). Water must be pumped out into a well-vegetated area some distance from any watercourse to facilitate sediment trapping and reduce the chance of sediment entering wetlands/streams. • Excavated and imported material must be stored away from stream lines/areas of concentrated flow to limit the risk of sediment wash to downstream areas. • Any topsoil removed from wetlands must be stockpiled separately from subsoil material and replaced once mining is complete to facilitate re-colonisation of the site. • Stripped topsoil from wetlands must not be buried or in any other way be rendered unsuitable for further use by mixing with spoil or subjected to compaction by machinery. • Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. The channel embankments must be rehabilitated to ensure both longitudinal and cross-sectional stability against summer floods.
Pollution		
Waste management/ pollution control	Negative	• Storage of potentially hazardous materials (e.g. fuel, oil, etc.) should be outside of the 100-year flood line, or within a horizontal distance of 500 m from a watercourse or wetland. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas. • Operation and storage of machinery and mining-related equipment must be done outside of wetlands and rivers

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		wherever possible, unless authorised by a Water Use License (WUL). • Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of in the natural environment). Any contaminated soil from the site must be removed and rehabilitated timeously and appropriately. • Mechanical plant and bowsers must not be refuelled or serviced in or directly adjacent to any watercourse (including river and wetlands). • Provide adequate waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment, but to use available facilities. • Ensure that any rubbish is regularly cleared from the site, especially from wetlands/streams. • Routinely check machinery/plant for oil or fuel leaks each day before mining activities begin. No stockpiling must take place in a watercourse, including wetlands and the riparian area of the river. • Sanitation. Portable toilets (1 toilet per 30 users is the norm) to be provided where mining occurs. Workers must be encouraged to use these facilities and not the natural environment. Toilets must be located outside of the 1:100 yr. flood line of a watercourse or 500 m or from any natural water bodies, including streams and wetlands. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.
Social		
Recruitment strategies for the mine	Positive	N/A
Advantage to previously disadvantage individuals	Positive	N/A
Community development programmes	Positive	N/A
Upgrades and expansion of services will benefit local area	Positive	N/A

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Increased income generation for local community	Positive	N/A
Increased job opportunities for local mining communities	Positive	N/A
Noise		
Noise emanating from heavy machinery and transport vehicles	Negative	• Noise barriers in the form of berms should be constructed as close to the noise sources as possible. • Mining-related machines and vehicles must be serviced regularly to ensure noise suppression mechanisms are effective, e.g. installing exhaust mufflers where possible. • Noisy machinery must be used predominately during daylight hours. • Grievance mechanism to record complaints should be kept on site and investigated. • Regular noise monitoring to take place.
Noise from blasting	Negative	• Blasting operations are generally intermittent and should be limited to the day when ambient noise levels are highest.
Infrastructure (e.g. contractor's yard, weighbridge, workshop and stores)	Negative	• To reduce the visual impact of permanent structures, colours for roofing, walls, etc. should have a matt finish to reduce reflection. • Infrastructure must be located away from sensitive and elevated areas.
Location of stockpiles, pollution control dams and discard dumps	Negative	• Place as far away as possible from roads and settlements. • Topsoil stockpiles must be vegetated as soon as possible, to reduce erosion and decrease visual disturbance. • Keep stockpiles as low as possible to reduce visual impact. • Plant fast-growing indigenous trees around the dams to enhance visual.
Lighting pollution	Negative	• Avoid up-lighting of structures. Rather direct the light downwards and focus it on the object to be illuminated. • Use non-UV lights where possible, as light emitted at one wavelength is less attractive to insects. This will reduce the likelihood of attracting insects and their predators in the site camps. • ''Noise level discussions have commenced.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
Heritage and cultural		
Heritage resources disturbed/destroyed	Negative	1. From a heritage perspective, supported by the findings of this study, the proposed mining development and associated developments are feasible. However, the proposed mining development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed sites. 2. The recorded historical farmstead is older than 60 years and is thus protected by Section 34 of the NHRA. 3. Although the historical farm house and stock kraal are in a poor state of conservation, they must be assessed and documented. They must not be destroyed without a permit from PHRA as prescribed in Section 34 the NHRA. 4. The recorded burial site must be demarcated by a danger warning sign and clearly marked to avoid any accidental damage by heavy mining equipment and haulage trucks. 5. The applicant must ensure that the descendants of the recorded graves are sought and notified that the proposed mining development has an impact (directly or indirectly) on their burial site. 6. No stone robbing or removal of any material is allowed. Any disturbance or alteration to this burial site would be illegal and punishable by law, under Section 36(3) of the NHRA. 7. Contractors and workers will be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51. (1). 8. Any measures to cover up the suspected archaeological material or collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement of the SAHRA. 9. The footprint impact of the proposed mining development and associated infrastructure must be kept to a minimum to limit the possibility of encountering chance finds. 10. Should any unmarked burials be exposed during mining, affected families must be tracked and consulted and relevant rescue/relocation permits must be obtained from SAHRA before any grave relocation can take place. A professional archaeologist must be retained to oversee the relocation process in accordance with the NHRA. 11. Should chance archaeological materials or human burial remains be exposed during mining work on any section of the proposed mining development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial
Paleontological sites disturbed/destroyed	Negative	
Cultural places disturbed/destroyed	Negative	

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		action is warranted, is to minimise disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA. 12. The project PPP must ensure that any cultural heritage related matters for this project are given due attention when they arise and are communicated to PHRA throughout the proposed project development. This form of extended community involvement would pre-empt any potential disruptions that may arise from previously unknown cultural heritage matters that may have escaped the attention of this study. 13. The landowner must be requested to declare burial sites on their farmsteads to the EAP. 14. Subject to the recommendations made herein and the implementation of the mitigation measures and adoption of the project EMP, there are no other significant cultural heritage resources barriers to the proposed mining right application. The heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations made.
Traffic		
Increased traffic volumes on the existing road networks	Negative	• Implement speed limits and safety controls on-site. • Construct access roads in safety limits from other crossings. • Possible road upgrades where required. • Create safe environment for pedestrians, animals and motorists. • Create fauna underpasses where necessary (e.g. bridge crossings).
Blasting and vibration		
Blasting and vibration	Negative	• Pre-blast survey of all structures in the mining area. • Ground vibration survey in the form of a signature trace study to be done for determination of ground vibration constants that can be used for accurate ground vibration prediction. • Investigate the possibility of alternative methods to blasting.
Safety		
Blasting	Negative	• Clearly demarcate areas and erect signs to indicate blasting zones.
Roads and vehicles	Negative	• Speed limits must be in place on site and before access roads on a provincial or national road. • Ensure drivers are trained in road safety.
Surrounding neighbours	Negative	• Personnel are not permitted on other properties without permission. • Avoid conflict with surrounding landowners.

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ recommendations
		• Safety specialist will be appointed and assessments will be conducted. Recommendations will be implemented.
Air quality		
Dust pollution	Negative	• The removal of vegetation will be minimised during stripping to reduce the effects of dust pollution due to exposed soil. • Water or dust control agents must be used in working areas, and roads will be sprayed for dust suppression on a regular basis in designated susceptible areas during heavy usage. • Dust monitoring must be undertaken in accordance with the monitoring programme. It is recommended that topsoil stockpiles be vegetated to sustain biological components and prevent dust emissions. • Reduction of dust fallout levels and particulate matter. • All coal haul trucks must be covered with a tarpaulin. • The overland conveyor belt should be covered and coal on the conveyor should be sprayed to reduce emissions. • ‘’Air quality discussions have commenced.

Project phase	Activities	Impacts
Construction	• Site establishment • Site clearing, including the removal of topsoil and vegetation • Construction of mine-related infrastructure, including haul roads, PCD • Construction of plant • Relocation of Infrastructure; • Blasting and development of initial box-cut for mining, including stockpiling from initial box cuts • Temporary storage of hazardous products, including fuel and explosives	• Loss of land capability • Loss of topsoil as a resource • Soil compaction from heavy machinery and vehicles • Soil erosion due to wind and surface water run-off • Loss of land use and capability • Increased erosion and compaction • Loss of habitat and species • Habitat fragmentation • Increased alien vegetation • Sedimentation leading to siltation and deteriorated water quality • Reduced surface water infiltration and baseflow as a result of soil compaction and impervious surfaces • Alteration in surface water drainage patterns • Increased velocity in surface water run-off leading to erosion and sedimentation • Lowering of the water table, if the site clearing and construction activities will take place below the water table • Construction and development activities in a greenfield site are negative to wetlands and catchment • Loss of wetland habitat (soils and vegetation)

Project phase	Activities	Impacts
Operational	• Stripping topsoil and soft overburden • Removal of overburden, including drilling and blasting of hard overburden • Loading, hauling and stockpiling of overburden • Development and operation of surface infrastructure • Drilling and blasting of coal • Load, haul and stockpiling of RoM coal • Use and maintenance of haul roads for the transportation of coal to the washing plant • Water use and storage on-site • Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste	• Loss of land capability • Loss of topsoil as a resource • Soil compaction from heavy machinery and vehicles • Soil erosion due to wind and surface water run-off • Loss of land use and capability • Increased erosion and compaction • Loss of habitat and species • Habitat fragmentation • Increased alien vegetation • Increased run-off resulting in water contamination and/or the deterioration of the water quality • Reduction of catchment yield as run-off water contained in PCD • Water level lowering due to mining block dewatering • Groundwater contamination due to PCD seepage • Groundwater contamination due to seepage from overburden stockpiles, slurry and discard deposition • Loss of wetland habitat (soils and vegetation) • Perforation of rock and groundwater reserves leading to severe hydrological and geomorphological impacts to wetlands and catchment • Mining operations negative impact to functioning wetlands and catchment
Decommissioning	• Dismantling and removal of all infrastructure, including transporting materials off-site • Rehabilitation, including spreading of topsoil, revegetation and profiling or contouring as per original landscape features • Environmental monitoring of decommissioning activities • Storage, handling and treatment of hazardous products and waste • Post-closure monitoring and on-going rehabilitation	• Mine decanting causing groundwater and possible stream contamination • Surface water contamination • Significant potential negative impacts to functioning wetlands and catchment if not done correctly • Spread of alien invasive vegetation • Increased soil compaction erosion and subsequent sedimentation into the wetland ecosystems • Post-mining water decant is predicted to occur once the final void has been rehabilitated and groundwater levels are allowed to return back to natural levels (this decant may be acid-forming)

The significance, probability and duration of these potential impacts have been assessed based on the detailed specialist studies undertaken on the sensitivity of the receiving environment. The extent to which the impact can be reversed or may cause irreversible loss of resource, and whether it can be avoided, mitigated or managed is indicated.

28 SOCIO-ECONOMIC

28.1 Construction

28.1.1 Employment creation during the life of mine

The proposed project will require settling surface infrastructure and has the potential to provide direct employment to people in the area. Placement of the structures will last for a maximum of ten days and will likely involve semi-skilled labour.

A large number of households in the secondary and primary study areas face significant socio-economic challenges like poverty, unemployment and underdevelopment. Any opportunity providing employment therefore has the potential to improve the livelihoods and income stability of future employees and their dependants, especially if employees originate from households that are socio-economically depressed. Whether unemployed and under-employed individuals will be able to take up employment opportunities depends largely on their level of education, skill and work experience and a skills audit programme will be conducted beforehand.

In addition to creating job opportunities for the affected community, the project will also lead to indirect employment creation in the informal sector, for instance in terms of food stalls for workers. If not carefully mitigated, these potential positive effects may trigger significant price inflation for plots that are being sold.

28.1.2 Mitigation measure and recommendations

In order to enhance the benefits of employment creation for other communities, it is recommended that the following measures be implemented:

- Promote the creation of employment opportunities for locals, especially women and youth, above the targets set out in the Mining Charter.
- If required, the local resident status of job applicants should be verified in consultation with community representatives, municipal structures and landowners to ensure local recruitment. A skills audit must be implemented.
- Lazalelihlokohloko Mining and Projects should identify its required core skills (operational phases) and extend employee skills audits to investigate the prevalence of required skills in nearby communities and structure its skills development endeavours accordingly.
- Where feasible, Lazalelihlokohloko Mining and Projects should offer training and skills development to improve the ability of local community members, especially those residing in the primary study area, to take advantage of employment opportunities arising through the Project.
- Recruitment should take place using a registry of job-seekers and SMMEs, as opposed to lists of potential candidates and service providers compiled by an individual – this minimises the risk of nepotism or corruption tainting the recruitment process.

- Recruitment is not recommended during the first phase of mining. Care must be taken to ensure fair and transparent recruitment practices that are not unduly influenced by pressure groups, like political parties, when they commence.
- A monitoring system should be established to ensure that Lazalelihlokohloko Mining and Projects and its subcontractors honour local employment policies and other measures to enhance local employment.
- Once the operation has been completed, locals employed on a contract/temporary basis during placement of infrastructure should be provided with reference letters that they can submit to gain employment elsewhere. Certificates of completion should be provided for in-house (on-the-job) training provided.

28.2 Economic impacts

Economic impacts can affect the economy positively and negatively and can have direct and indirect impacts. Direct Impacts will be initial and immediate economic activities (jobs and income), while indirect impacts will be the production, employment and income changes occurring in other business/industries due to the proposed operation. Induced impacts are the effects of spending by the household in the local economy as a result of the direct and indirect effects.

There are different categories of communities involved in, or affected by mining operations:

- Occupational communities: Households/families who derive all or most of their income from mining.

- Residential communities: Households/families who live in the geographical area affected by mining. They may live in proximity or some distance away but may be affected by mining activities like a river polluted by mine tailings. These communities fall into two types: those in existence before the mine was built and those that developed as a result of the mining operation.

- Indigenous communities: Households/families with an ancient and cultural attachment to the land where the mining occurs or has an impact.

Due to the medium size of the operation, the expected community impact is very low. There are no informal or formal settlements on the proposed mining land to be excavated and thus no relocation is necessary. The proposed mining area is in close proximity to the labour sending areas, thus the formation of an informal or formal settlement near the mine is not expected. The operations often provide surrounding areas with jobs, which may enable those in subsistence to join the cash economy. Companies are increasingly required to assist local business development, to outsource services and give preference to local businesses and SMMEs. Operations have a finite lifespan and it is difficult to sustain the direct benefits they bring to communities in terms of wages and improved welfare after closure.

28.2.1 Mitigation measures and recommendations

The measures recommended in the preceding section to maximise local employment through the project will also serve to maximise the positive impacts of the project on the local economy. The following measures are recommended:

- Promote procurement from local and HDSA enterprises above the targets set out in the Mining Charter.
- If any subcontractors are appointed, Lazalelihlokohloko Mining and Projects should give preference to suitable subcontractors/ SMMEs located in nearby towns, then in the secondary study area and only then further away in Mpumalanga.
- Where appropriate and where SMMEs do not exist locally, Lazalelihlokohloko Mining and Projects must investigate the possibility of aligning/updating their current SLP to develop this service capacity among local, preferably HDSA suppliers.
- Local procurement targets and procedures should be formalised in the mine's procurement policy, which is currently in a draft format, with reasonable penalties to the contractors who do not meet their targets. Such penalties (if monetary) could be used for capacity building and SMME development initiatives.
- Contractors' procurement practices should be monitored and they must be reminded of the preference to procure locally. Where contracts are awarded to non-local service providers, contractors must prove that reasonable action was taken to identify a local service provider.
- If a register of local SMMEs does not exist at the labour desk of the municipality, Lazalelihlokohloko Mining and Projects should consider developing such a register that lists the types of goods and services provided by them. Alternatively, they can consult nearby mines to determine if they would be willing to make their business registers/databases available for use by the project.
- Investigate the feasibility of establishing linkages with institutions other than the local municipality involved in SMME development, like neighbouring mines, community-based development projects and Non-Governmental Organisations (NGOs) active in the project area.

28.2.2 Displacement of households and workers

28.2.2.1 Impact description

Any project with a physical footprint inevitably requires a land acquisition process. One of the most significant socio-economic impacts that may result from such land acquisition is the displacement of persons residing on or making use of the land. Displacement-related impacts encompass physical displacement (loss of a home and the need to move elsewhere) and/or economic displacement (loss of income and productive assets like cultivated fields or business stands) from the acquired land (IFC, 2012).

In this project's case, physical and economic displacement is applicable as the current land use entails agricultural land where workers will lose their agricultural jobs, as will workers and co-dependents that reside closer to the proposed mine. In addition, direct and indirect displacement of land users can take place by the proposed project. Indirectly affected parties are motivated by the fact that international good practice advocates clearing a safety buffer of 500 m around areas where blasting will take place in the open cast mining blocks (IFC, 2012). The South African Mine Health and Safety Act allows for a smaller buffer of 100 m around primary project infrastructure (mine shafts, stockpiles, open pits, etc.).

The proposed location of infrastructure components will result in the physical displacement of several vulnerable households (these households do not own the land on which they reside, and will therefore not be entitled to compensation if the land is sold/leased to the mine) located on Mooihoek 168 HT, Klipspruit 136 HT , Klipspruit 137 and Klipspruit 138 HT.

The proposed project will also result in several instances of direct economic displacement:

- The property on which infrastructure will be erected is used for commercial farming and/or grazing. Loss of this land would constitute economic displacement as landowners/users will have to secure alternative farming and grazing land at a considerable cost, or jeopardise the sustainability and profitability of larger farming units, as farm lands are usually operated as one business unit. Therefore, the severity of the impact will be determined by the proportional contribution of the affected property to the business operation, as well as the likelihood of securing a suitable replacement property with compensation paid to the affected party (if any).
- Produce from commercial crop farming and livestock is sold for income. The loss of the property will constitute economic displacement, as both the aforementioned activities contribute to the livelihoods of the property owner and the employees' households. It is anticipated that the land owner will be compensated for the property at least at a market-related price. The employees, depending on the property, may lose their positions and livelihoods with no guarantees that they will be able to re-establish their living conditions and livelihoods if the property owner re-establishes the farm elsewhere. Worst case scenario is that these employees will be without a job if the landowner does not purchase new property and provide them with job opportunities.

It is anticipated that the impacts of surface infrastructure and open pit development could contribute to indirect economic displacement. Neighbouring farmers, indicated that together these factors would likely force them to close down their farms. This will increase the number of displaced occupants, as it will result in the indirect economic displacement of the owners, their households, and the individuals who are employed at these operations (and operations that depend on the affected operation), assuming it is not re-establish elsewhere.

28.2.2.2 Mitigation measures and recommendations

Lazalelihlohloko Mining and Projects must endeavour to minimise the extent of direct physical and economic displacement through informed project design and implementation, in particular revising infrastructure placement to maximise distance from residential and commercial land uses. Where displacement cannot be avoided, the following measures should be implemented to minimise adverse impacts resulting from displacement:

- The sales agreement of any land to be acquired by the project should reflect the holistic value of the land prior to mining. This value should be determined by a professional property valuator and

include the potential relocation cost of commercial farms and/or business operations on a case-by-case basis, regardless of whether they are directly or indirectly impacted.
- The physical and economic displacement of households (i.e. landowning and vulnerable households) and individuals should be considered on a case-by-case basis. The project should negotiate a favourable solution with each displaced household, and the extent of economic displacement should be investigated by a suitably-qualified professional.
- Consider including employees and businesses indirectly displaced by the project in the aforementioned process.
- Where indirect displacement occurs, it is suggested that Lazalelihlohloko Mining and Projects engage with adjacent landowners and compile the baseline, as well as monitor the effects of the mining activity on the production at the potentially affected farm.
- If production is affected and this is proven to be the result of mining activity, engage with adjacent landowners and investigate appropriate alternatives suitable for all the parties to ensure overall production is not affected.
- It is important to point out that, based on other mining projects, employees on farms and other impacted businesses are often not compensated and/or provided with alternative accommodation by land owners if the farms on which they reside are acquired by the project. Moreover, companies often insist that they are not responsible for the wellbeing of farm/domestic workers who may be directly affected following the sale of a property (as per the willing buyer willing seller principle). International best practice, nevertheless, requires that these workers be compensated by the applicant.

28.2.3 Community development and social upliftment

28.2.3.1 Impact description

Lazalelihlohloko Mining and Projects will contribute to community development and social upliftment through the implementation of its SLP and carrying out commitments made in terms of its procurement and employment policy. These plans and policies have the potential to facilitate and catalyse socio-economic development in the project-affected communities, as several of these communities have a relatively low socio-economic base. These initiatives – especially if implemented in consultation with those of other developmental role-players (like the MLM, non-governmental organisation, other mines in the area, and other existing development programmes e.g. Municipal LED programmes) – can contribute substantially towards socio-economic development, sustainable jobs and income stability in the study area.

Lazalelihlohloko Mining and Project's SLP and procurement policy outlines several actions that will enhance socio-economic development among local communities, including:

- Human Resource Development (HRD) by means of a skills development plan, career progression plan, mentorship, bursaries and learnerships. The skills development plan will include the development of mining-related skills, portable skills and ABET. HRD will mainly focus on mine workers; as mentioned previously, a minimum of 50% of the mine's workforce will be sourced from

local labour. These labourers will, for the most part, be appointed in unskilled and semi-skilled positions and they will benefit from the work experience.
- The LED strategy, which will focus on communities affected by the proposed project, recognises that LED projects can have negative long-term effects (including increasing economic dependency on the mine and their partners) if they are not designed to be sustainable beyond the LoM.
- Investments, which will include funding the development of key service delivery infrastructure and several SMME development programmes in the communities surrounding the project.
- Lazalelihlohloko Mining and Projects intends to empower and develop previously disenfranchised communities and individuals through preferential procurement from HDSA vendors. This will potentially allow these vendors, at the time of mine closure, to supply goods and services to non-mining enterprises.

Successful implementation of the aforementioned programmes will maximise the benefits of the proposed project for communities in the primary and secondary study. It will also offset some negative impacts that these communities may experience as a result of the proposed project.

28.2.3.2 Mitigation measures and recommendations

To maximise the positive and reduce the negative impacts, the following measures are recommended:

- To ensure that future skills development, Corporate Social Responsibility (CSR) and LED initiatives address the needs of the beneficiary communities or individuals, the details of development projects should be finalised in consultation with local government and the local community and employee representatives.
- Often, there are existing initiatives that need financial and/or technical support that the mine could provide, e.g. programmes being implemented as part of the Comprehensive Sustainable Rural Development Programme, Municipal LED Projects, or LED projects at nearby mines. It is proposed that Lazalelihlokohloko Mining and Project's department responsible for Corporate Social Investment (CSI) or community development contact the CSR and/or community development departments of other enterprises (e.g. local and district municipalities, neighbouring mines and non-governmental organisations) in the area to gauge whether they can align or synergise with any of their efforts to collaborate in some of the development initiatives already planned for the area.
- It is recommended that a monitoring system be established to ensure that Lazalelihlokohloko Mining and Projects and its contractors comply with the company's policy and the Mining Charter in terms of preferential HDSA procurement.
- Lazalelihlokohloko Mining and Projects should expand its skills development and capacity building programmes to non-employees, to include residents of communities in the study area. Programmes offered to non-employees and contractors must be geared towards making individuals employable in the mining industry, as well as enabling them to establish and manage SMMEs that will be able to meet the needs of the mining industry elsewhere in the region.
- A record of training courses completed per individual should be kept in a skills database. Where training is offered to non-employees, their details should be shared with other industries in the area with the aim of finding them employment should the project be unable to offer them employment.

28.2.4 Influx of people

28.2.4.1 Impact description

As news regarding the proposed mine spreads or when mining-related activities increase, expectations regarding possible employment opportunities at the mine will also increase. Subsequently, the area surrounding the site and neighbouring farms may experience an influx of job seekers. The magnitude of this impact will, amongst others, be influenced by the severity of poverty and unemployment, as people are more inclined to travel in search of better livelihoods.

The socio-economic profile of the population in the secondary and primary study area indicates that poverty and unemployment are widespread throughout these areas. It can therefore be anticipated that job seekers (and sometimes whole families), as well as entrepreneurs and opportunists, will move to the broader project area. The portion of the workforce that will be recruited from outside the local area (approximately 80%), will constitute an additional influx of people. Unsuccessful job seekers from outside the primary study area may decide to settle in the project area. This impact may commence prior to construction, and is likely to continue once construction has been completed. The influx of construction workers, jobseekers and others is expected to have a variety of social consequences, including:

- Increased pressure on local services, resources and facilities, which is currently lacking in this area. The municipality cannot necessarily keep up with service delivery as there are existing water, sanitation and electricity shortages.
- Establishment and growth of informal settlements as there is a shortage of housing in the area.
- Increase in social pathologies, like substance abuse, prostitution and increased incidences of sexually transmitted diseases (STDs).
- Higher demand and increased markets for food, including meat. This scenario could inflate prices and result in increased poaching from livestock farmers in surrounding areas, as well as bush meat hunting.
- Conflict/competition between newcomers and the current population, e.g., perception among locals that the outsiders are taking jobs that could have gone to unemployed members of the local community.
- Perception of increased crime and safety risks to the area due to the newcomers.

28.2.4.2 Mitigation measures

The following measures are recommended to address the aforementioned impacts:

- Measures to address population influx
    - The design of effective in-migration management strategies requires an understanding of the dynamics and potential impacts of the phenomenon, taking into account specifics of the locations and areas in which the in-migration will occur. In this regard, it is suggested that Lazalelihlokohloko Mining and Projects commission a detailed situation analysis and, depending on the findings of this analysis, commission an Influx Management Plan.

- The recruitment of employees and contractors should be executed as discussed in the aforementioned point (especially in terms of preferentially employing from local labour sending areas), thereby discouraging loitering near the proposed mine.
- Ensure that the intention of giving preferential employment to locals is clearly communicated, in order for locals to have a fair opportunity and reduce potential conflict situations.
- Involve local community structures (e.g. ward councillors) to assist in communicating the intention to give preference to local labour, and to assist in identifying the local labour pool (with this being said, ward councillors need to make an effort to be involved as the public does not trust or rely on them).
- It is strongly recommended that Lazalelihlokohloko Mining and Projects liaise with the municipality to ensure that expected population influx is taken into account in spatial and infrastructure development planning of the area.
- No poaching of livestock or bush meat may take place. All offenders should be prosecuted.
- Consider providing housing for workers.

The following management measures will minimise the occurrence of social pathologies:

- Implement HIV/AIDS and alcohol abuse prevention campaigns in the communities.
- Lazalelihlokohloko Mining and Projects should make their HIV/AIDS awareness and prevention programmes a condition of contract for suppliers and sub-contractors:
  - Lazalelihlokohloko Mining and Projects should provide an adequate supply of free condoms to workers.
  - A voluntary counselling and testing programme must be introduced during construction and continued during operation.
  - It is recommended that contractors conduct an annual HIV/AIDS and STD prevalence survey amongst its workers. This will involve a voluntary test which is available to the whole workforce. The results of the survey will help to determine an HIV/AIDS and STD prevention strategy.
  - When, and if, statistically representative, the results of the survey should be made available to management and workers simultaneously. Results should be presented in statistical terms so as to ensure confidentiality.
  - Access at the site must be controlled to prevent sex workers and petty traders from visiting and/or loitering at, or near, the construction camp/mine site.
  - Financially support the appropriate government agencies, local clinics and NGOs involved in raising community awareness and education with regard to STDs and substance abuse.
- Measures to address crime:
  - Workers should be clearly identifiable by wearing proper uniforms displaying the logo of the company; this will decrease the number of opportunistic people wandering near the site under the guise of being Coal mine employees.
  - Liaison structures are to be established with local police to monitor social changes in crime patterns during the construction and operation phase of the mine. A liaison should be established with existing crime control organisations, like local community policing forums, private security companies and other crime prevention organisations.

  - Through the abovementioned forum, identify if recorded criminal activities (e.g. violent crimes, housebreaking and stock theft) involved members of the mine's workforce and act accordingly.
  - Lazalelihlokohloko Mining and Projects should enforce clear rules and regulations for access to the project site to control loitering. The proponent should consult with the local police service to establish standard operating procedures for the control and/or removal of loiterers.
- Measures to address potential conflict between locals and non-locals:
  - The mine's recruitment and procurement policy must be fair, transparent and readily available to, especially, the local community.
  - Establish a community liaison office and grievance mechanism at a location that is accessible to members of the surrounding communities.
  - Mine security should be empowered in terms of resources and facilities to effectively manage security issues relating to incidents of community unrest at/near the mine site. Great care should be taken to respect the human rights of all people involved.
  - Develop standby procedures with the local police service to assist with crowd control.
  - In the event of conflict between the locals and non-locals, a conflict management plan should be compiled.

Impacts rating

Impact	Status	Extent	Duration	Probability	Severity	Pre-mitigation
Direct employment creation	Positive	4	1	5	3	15 (H)
Indirect employment creation	Positive	3	2	4	3	12 (MH)
Economic gain	Positive	4	2	4	3	12 (MH)
Displacement of households	Negative	3	5	5	5	25 (H)
Loss of agricultural jobs	Negative	2	5	5	5	25 (H)
Community development and social upliftment	Positive	4	4	4	4	16 (H)
Community safety	Negative	3	2	4	3	12 (MH)
Increased pressure on local services due to influx of people	Negative	4	2	4	3	12 (MH)
Increased informal settlements due to influx of people	Negative	4	4	4	3	12 (MH)
Increased poaching due to influx of people	Negative	4	1	4	3	12 (MH)
Conflict between newcomers and local community	Negative	3	2	5	3	15 (H)
Direct employment creation	Positive	4	1	5	4	20 (H)
Indirect employment creation	Positive	3	2	5	4	20 (H)
Economic gain	Positive	4	2	5	4	20 (H)
Displacement of households	Negative	3	5	5	5	25 (H)

Impact	Status	Extent	Duration	Probability	Severity	Pre-mitigation
Loss of agricultural jobs	Negative	2	5	5	4	20 (H)
Community development and social upliftment	Positive	4	4	5	4	20 (H)
Community safety	Negative	3	2	2	3	6 (M)
Increased pressure on local services due to influx of people	Negative	4	2	3	3	9 (M)
Increased informal settlements due to influx of people	Negative	4	4	2	3	6 (M)
Increased poaching due to influx of people	Negative	4	1	2	3	6 (M)
Conflict between newcomers and local community	Negative	3	2	3	3	9 (M)

28.2.5 Operational phase

28.2.5.1 Dust generation from a social and health perspective

The community settled in an area where there are many sources of dust, including:

- dust created by vehicles travelling on dirt roads
- dust from agricultural activities
- dust created by nearby existing mines

The proposed project will intensify the dust that the community is exposed to through construction activities and the activities associated with the new wash plant. The community lives very close to the mining area and the dust does not only impact their health, but their quality of life. Vulnerable people such as the elderly, child-headed households and young children are of special concern.

28.2.5.2 Stimulation and growth of the local and regional economies

Impact description

This project could stimulate domestic production, job creation and government revenue. In particular, the project will, during its operational phase, contribute to the GDP of the region and province and create direct and indirect employment opportunities. The project will be required to pay a considerable amount of rates and taxes. Such an injection could contribute to the development of the municipal area, including upgrading of services, thereby creating conditions which can be conducive to economic growth.

It is expected that the benefits of the proposed project will extend beyond members of the mine's workforce to suppliers through the procurement of products and services. Lazalelihlokohloko Mining and Project's referential procurement strategy adheres to the stipulations of the MPRDA and aims to achieve HDSA procurement targets set out in the Mining Charter. The strategy will increase opportunities for HDSA suppliers, which will be conducive to enterprise development and economic growth in communities in the secondary study area.

Mitigation measures

Measures recommended to enhance the benefits from local employment and economic multiplier effects, as well as community development, will maximise the positive impacts of the proposed project on the economy. In addition, the following measures are recommended:

- Implement measures suggested in this assessment.
- Incorporate SMME capacity building programmes into future iterations of the mine's SLP, which will enable HDSA suppliers to take maximum advantage of opportunities provided through mine-related procurement.
- To maximise the empowerment of HSDA companies (and the sharing in project benefits by the disadvantaged communities in general), the project should attempt to establish long-term procurement contracts with local suppliers (where possible).
- An independent monitoring system should be established to ensure that the mine and its contractors comply with government regulations and company policies related to HDSA procurement.

28.2.5.3 Blasting and vibrations from a social perspective

Impact description

Blasting is one of the greatest community concerns, as damage to houses and injuries to people are possible. If the blast radius is too close to existing houses, some people may need to evacuate. The mine would likely have to move people in close proximity to the blasting due to safety issues associated with blasting. Blasting and vibrations impact people's sense of safety, their quality of life and material wellbeing. Given the high rates of poverty in the community, any damage to goods it will be difficult for most households to recover from. Many people also live in traditional houses or mud houses that cannot structurally deal with blasting, and as a result these houses are damaged often. Due to their socio-economic conditions they cannot afford better housing.

Mitigation measures

- The timing of blasting needs to be indicated and communicated to the community on a weekly basis.
- Relocation of households within 500 m of the blasting impact should be considered.
- A grievance mechanism should be in place, and all communication should be recorded and made available to all parties.
- There must be a feedback mechanism to ensure that the person that laid the complaint is informed about how it was dealt with. Feedback should be given in a reasonable time.
- The mine should liaise with the MLM about formalising the houses in the area and providing municipal services to all houses. The supply of housing and services is the responsibility of the government, but where the mine is liable, consultation with the MLM should take place.

Impacts rating

Impact	Status	Extent	Duration	Probability	Severity	Pre-mitigation
Direct employment creation	Positive	4	5	5	4	20 (H)
Indirect employment creation	Positive	4	5	4	4	16 (H)
Paying rates and taxes	Positive	3	5	4	4	16 (H)
GDP injection	Positive	4	5	4	4	16 (H)
Royalty payments	Positive	4	5	4	4	16 (H)
Dust from a social health perspective	Negative	2	5	5	4	20 (H)
Blasting and vibration from a social aspect.	Negative	3	5	5	4	20 (H)
Water quality and quantity	Negative	3	5	5	4	20 (H)
Conflict between newcomers and local community	Negative	3	2	5	3	15 (H)
Direct employment creation	Positive	4	5	5	5	25 (H)
Indirect employment creation	Positive	4	5	5	5	25 (H)
Paying rates and taxes	Positive	3	5	5	5	25 (H)
GDP injection	Positive	4	5	5	5	25 (H)
Royalty payments	Positive	4	5	5	5	25 (H)
Dust from a social health perspective	Negative	2	5	3	2	6 (M)
Blasting and vibration from a social aspect	Negative	3	5	2	3	6 (M)
Water quality and quantity	Negative	3	5	3	3	9 (M)
Conflict between newcomers and local community	Negative	3	2	3	3	9 (M)

29 METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

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

1. Status of impacts (Table 42): Determines whether the potential impact is positive (positive gain to the environment), negative (negative impact on the environment), or neutral (no perceived cost or benefit to the environment).
2. Spatial scale of impacts (Table 43): Determines the extent of the impact on a scale of localised to global effect. Potential impact is expressed numerically on a scale of 1 (site-specific) to 5 (global).
3. Temporal scale of impacts (
4. Table 44): Determines the extent of the impact in terms of timescale and longevity. Potential impact is expressed numerically on a scale of 1 (project duration) to 5 (permanent);
5. Probability of impacts (
6. Table 45): Quantifies the impact in terms of the likelihood of the impact occurring on a percentage scale of <5% (improbable) to >95% (definite).
7. Severity of impacts (
8. Table 46): Quantifies the impact in terms of the magnitude of effect on environment (receptor) and is derived by consideration of points 1, 2 and 3 above. For this particular study, a conservative approach is adopted for severity (e.g. where spatial impact was considered to be 2 and temporal impact was considered to be 3, a value of 3 would be adopted as a conservative estimate for severity of impact).

Table 42: Status of impacts

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

Table 43: Spatial scale of impacts

Rating	Description	Quantitative rating
Very low	Site-specific – Impacts confined within the project site boundary	1
Low	Proximal – Impacts extend to within 1 km of the project site boundary	2
Medium	Local – Impacts extend beyond to within 5 km of the project site boundary	3
High	Regional – Impacts extend beyond the site boundary and have a widespread effect - i.e. > 5 km from project site boundary	4

Rating	Description	Quantitative rating
Very high	Global – Impacts extend beyond the site boundary and have a national or global effect	5

Table 44: Temporal scale of impacts

Rating	Description	Quantitative rating
Very low	Project duration – Impacts expected only for the duration of the project or not greater than 1 year	1
Low	Short term – Impacts expected on a duration timescale of 1-2 years	2
Medium	Medium term – Impacts expected on a duration timescale of 2-5 years	3
High	Long term – Impacts expected on a duration timescale of 5-15 years	4
Very high	Permanent – Impacts expected on a duration timescale exceeding 15 years	5

Table 45: Probability of impacts

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

Table 46: Severity of impacts

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

These five criteria are combined to describe the overall significance rating (Table 47). Calculated significance of impact determines the overall impact on (or risk to) a specified receptor and is calculated as: the product of the probability (P) of the impact occurring and the severity (S) of the impact if it were to occur (Impact = P × S). This is a widely accepted methodology for calculating risk and results in an overall impact rating of Low (L), Low/Medium (LM), Medium (M), Medium/High (MH) or High (H). The significance of a particular impact is depicted in Table 47 and assigned a particular colour code in relation to its severity.

Table 47: Significance of impacts

Rating	Description	Quantitative rating
Low	PxS=1-3 (low impact significance)	L
Low/medium	PxS=4-5 (low/medium impact significance)	LM
Medium	PxS=6-9 (medium impact significance)	M
Medium/high	PxS=10-12 (medium/high impact significance)	MH
High	PxS=13-25 (high impact significance)	H

Table 48: Perceived significance of impacts

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

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

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

Practicable mitigation and optimisation measures are recommended and impacts are rated in the prescribed way without and with the assumed effective implementation of the recommended mitigation (and/or optimisation) measures. Mitigation and optimisation measures are either:

- **Essential:** Measures that must be implemented and are non-negotiable.
- **Best practice:** Recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

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

30 POSITIVE AND NEGATIVE IMPACTS OF THE PROPOSED ACTIVITY (IN TERMS OF THE INITIAL SITE LAYOUT) AND ALTERNATIVES ON THE ENVIRONMENT AND COMMUNITY

The proposed MRA will be established on an area currently utilised for grazing. Upon closure of the MRA, the land will, once again, be useful for agricultural purposes. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding farmsteads if the mitigation measures proposed in this document are not implemented and managed on-site. The operation of the mine will, however, also have a number of positive impacts, such as permanent job creation for skilled, semi-skilled and un-skilled workers. The proposed mine will, therefore, contribute to upgrading/ maintaining infrastructure in and around Piet Retief area, which will indirectly contribute to the economy of the area.

31 POSSIBLE MITIGATION MEASURES AND THEIR LEVEL OF RISK

The impacts that are generated by the development can be minimised if measures are implemented to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

32 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

The alternatives considered for the project include the location, infrastructure layout and design, mining method, transportation of coal off-site and the "No-Go" alternative. In terms of the mining blocks, alternative sites were not considered as the location of the mineral resource (i.e. coal) determines the location of the mining operation.

33 MOTIVATION FOR THE ALTERNATIVE DEVELOPMENT LOCATION

The preliminary impact assessment conducted during the scoping phase and the sensitivity mapping exercise resulted in the identification of a preferred layout alternative. The overall location of the mining right area is based on the coal seam identified during the prospecting phase. Sensitivity analyses were, however, undertaken for each specialist study and used to inform the preferred infrastructure and location of the boxcut from watercourses and ensure that the appropriate buffer has been applied. Identified wetlands were excluded from the pit and infrastructure as far as possible. The layout also considered the proximity of old heritage structures in the mine boundary and buffered any action occurring where they are located.

The preferred mine layout was informed by various environmental and technical specialist studies and professional opinions, as well as existing GIS spatial data for Mpumalanga and South Africa. The initial site layout that was presented during the scoping phase has not changed substantially during the EIA phase, with the expectation that buffers would be added around wetlands and tributaries. Assessment of each identified potentially significant impact and risk

The potential impacts per activity and phase are detailed in Table 49 below.

Table 49: Assessment of each identified impact as per each activity

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
Site establishment	Loss of topsoil as a resource and soil compaction from heavy machinery and vehicles during site clearance	Soil, land capability, agricultural potential and hydropedology	Construction	High (negative)	• Follow adequate stripping guidelines (refer to the soil, land use and land capability assessment report). • Only remove topsoil when and where necessary. • If possible, topsoil should be stripped during dry months to reduce compaction. • Ensure each topsoil class is stored in one dedicated stockpile, 10 m high and away from surface water bodies. • If any erosion occurs, corrective actions must be taken to minimise further erosion. If erosion has already occurred, topsoil should be sourced and replaced, and shaped to reduce the recurrence of erosion. • Only the designated access routes and internal roads are to be used to reduce unnecessary compaction. • Prevent unauthorised borrowing of stockpiled soil. • Ensure proper storm water management designs are in place.	Medium-Low (negative)
	Loss of land capability, such as agricultural land and wetland features	Soil, land capability, agricultural potential and hydropedology	Construction	High (negative)	Rehabilitate the land to its original state.	High (negative)
	Loss of natural habitat	Terrestrial ecology	Construction	Medium (negative)	• Clearings associated with construction to occur in as small a footprint as possible. • Vegetation clearing close to the watercourse should be minimised and, where necessary, specialist storm water management should be put in place to limit erosion potential	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					of exposed soil. Sedimentation trapping should be in place to prevent exposed soils from spilling into the watercourse. • The watercourse and its buffer areas should be demarcated and fenced off prior to construction to exclude the watercourse from development activities. • Minimise the development footprint, where possible. • Consider layout and site alternatives for the proposed development infrastructure, which needs to be assessed and compared to select the option with the lowest impact.	
	Habitat fragmentation and edge effects resulting in alien plant invasion	Terrestrial ecology	Construction	Medium (negative)	• Buffer zones are allocated to sensitive or important habitat features to alleviate the effect of habitat loss, habitat fragmentation, disturbances, increased isolation and edge effects. It is suggested that at least a 100 m buffer zone from the drainage line be implemented as a wildlife support area. • Alien vegetation control should take place pre and post-construction, and during the closure and rehabilitation phase.	Medium-Low (negative)
	Sedimentation of surface water resources resulting in water quality deterioration	Surface water	Construction	Medium (negative)	• Development of the storm water management structures to ensure that sediment generated during the construction phase is conveyed to the silt trap, and clean water is diverted away from the boxcut and dirty water areas • Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration. • Roads should be maintained regularly to ensure that surface water drains freely off the road, preventing erosion. Where required, temporary measures should be placed during the construction phase to minimise erosion.	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					• Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events.	
	Movement of heavy machinery and vehicles for site clearing, resulting in reduced surface water infiltration and alteration in surface water drainage patterns due to soil compaction.	Surface and ground water	Construction	Medium (negative)	• Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration. • Roads should be maintained regularly to ensure that surface water drains freely off the road, preventing erosion. Where required, temporary measures should be implemented during the construction phase to minimise erosion.	Low (negative)
	Placement of impenetrable surfaces resulting in reduced surface water infiltration and alteration of base flow	Surface water, aquatic ecology	Construction	Medium (negative)	• Minimise vegetation removal in infrastructure footprint area. • Re-vegetation of the disturbed areas in the construction footprint areas once construction has been completed. • Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration. • Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events. • Where storm water enters river systems, sediment/silt and debris trapping, as well as energy dissipation control measures must be put in place. • Inspection of paved and unpaved roads to monitor for erosion	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	Loss of wetland habitat (soils and vegetation)	Wetlands and terrestrial ecology	Construction	Very high (negative)	There are no mitigation measures for loss of wetland habitat. It is recommended that the wetland area in question follow the mitigation hierarchy which includes avoidance, minimisation measures, restoration and biodiversity offsets. The latter is not preferred and should only be considered if the other mitigation measures are insufficient. This must be discussed with the Department of Water and Sanitation (DWS).	Very high (negative)
	Water catchment and functional watercourses	Wetlands, aquatic ecology, surface water, terrestrial ecology	Construction	High (negative)	• The edge of the non-directly impacted wetlands and streams, and at least a 500 m buffer, must be clearly demarcated in the field with wooden stakes painted red as no-go zones that will last for the duration of the construction phase. • Wetland monitoring must be carried out during the construction phase by a qualified wetland/aquatic specialist to reduce impact to wetlands, and where it cannot be reduced, implement a remedy as soon as possible. • The storm water management plan must be adhered to during the construction phase where surface water bodies within 200 m of the construction sites must be highlighted as sensitive receptors and clearly marked. • An alien and invasive plant species management programme must be in place pre-construction.	Medium to Low (negative)
	Increased runoff and erosion resulting in habitat change downstream	Aquatic and terrestrial ecology	Construction	Medium (negative)	• Apply effective storm water management principles to ensure that clean run-off is maximised and diverted to the receiving water resource, while contaminated run-off is minimised and contained for reuse in the operation. • Development of the storm water management structures to ensure that sediment generated during the construction phase	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					is conveyed to the silt trap, and clean water is diverted away from the box cut and dirty water areas.	
	Increased runoff resulting in reduced base flow and an alteration of aquatic habitats	Aquatic ecology	Construction	Medium (negative)	• Minimise vegetation removal in infrastructure footprint area. • Re-vegetation of the disturbed areas in the construction footprint area once construction has been completed. • Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration. • Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events. • Where storm water enters river systems, sediment/silt and debris trapping, as well as energy dissipation control measures must be put in place. • Storm water must be diverted from construction activities and managed in such a manner to disperse run-off and prevent the concentration of storm water flow.	Low (negative)
	Infrastructure noticeable to nearby receptors	Visual	Construction	Medium (negative)	• Vegetation must only be removed when and where necessary. • Topsoil should only be removed when and where necessary. • Topsoil stockpiles should be vegetated with indigenous grasses, like local species of the genera: Indigofera hybrida , Bowkeria citrina,Melanospermum italae ,Gerbera aurantiaca and Dracosciadium italae . • to blend into the surrounding landscape and reduce dust generation. • Limit the footprint area of topsoil stockpiles where possible. • Limit the height of topsoil stockpiles to 15 m.	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	Increased activity noticeable	Visual	Construction	Medium (negative)	• Where possible, use fencing that will screen the project area from nearby receptors. • Limit the height and footprint area of temporary laydown areas and facilities for construction workers. • Ensure screening vegetation is left intact around the project area and near receptors. • Ensure the surface infrastructure does not exceed proposed heights. • Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible. • Pylons and metal structures should be galvanised to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used on them.	Low (negative)
	Burial grounds, graves and historical buildings	Heritage	Construction	High (negative)	In the event of in situ conservation, complete a BGGC process in accordance with Section 36 of the NHRA. Where this is not possible, the relevant legislation needs to be followed and permit applications submitted to SAHRA as soon as possible.	Medium (negative)
	Noise emanating from the machinery	Noise	Construction	High (negative)	• Restrict construction activities to daylight hours (06:00 – 18:00), with no activity during weekends and public holidays. • Place diesel generator away from noise-sensitive receptors, as well as placing generators on isolation mounts and installation of secondary silencers. • Service machines and vehicles to the requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective. • Reverse alarms on vehicles should be broadband reversing alarms which emit directional, lower, less intrusive sound.	Medium (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					• Monitor environmental noise to establish compliance with the regulations and verify the predicted noise levels. • Switch off equipment when not in use.	
	Employment creation during construction	Social	Construction	Positive	• Assign preferred employment status to those experiencing the bulk of negative project impacts. • Promotion of local, female and youth employment to achieve and, where feasible, exceed the Mining Charter targets. • Where possible, labour-intensive construction methods should be promoted. • Verification of local residential status through consultation with appropriate authorities (e.g. municipal structures, community leaders, and landowners). • Consult neighbouring businesses/mines to determine if they would be willing to make their skills registers available. • Identify required core skills, expand skills audits to community and align and implement training and skills development initiatives to audit findings. • Expand skills development programmes, especially ABET programmes, to include surrounding communities. • Recruitment via a registry of job seekers and potentially coordinated through the DoL. • Provide local employees with certificates of completion for in-house (on-the-job) training. • Monitor subcontractors in terms of local employment targets.	Positive
	Local economy	Social	Construction	Positive	• Give preference first to capable local service providers to ensure the locals benefit first. • Develop local service provision capacity. • Monitor sub-contractor procurement.	Positive

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					• Develop a register of local SMMEs. • Link with skills/SMME development institutions and other mining operations. • SMME skills development as part of mine SLP commitments.	
	Community development and social upliftment	Social	Construction	Positive	• Expand skills development and capacity building programmes to non-employees, especially previously disadvantage individuals. • Establish an external monitoring system to regulate HDSA procurement. • Where feasible, training should be NQF accredited. • Keep a record of training courses completed per individual. • Liaise with beneficiaries to ensure needs are met. • Collaborate with other developmental role players during implementation.	Positive
	Displacement of locals	Social	Construction	High (negative)	Lazalelihlokohloko Mining and Projects should, where possible, endeavour to minimise the extent of displacement through project design. Where displacement cannot be minimised, the following measures are recommended to alleviate adverse impacts: • Finalise the project layout plan and determine its policy and approach to displacement, especially farm workers located around the site • The sales agreement of land purchased should reflect the holistic value of the land (determined by a professional valuer) and include the potential relocation cost of commercial farms and/or business operations. • The displacement of non-vulnerable households and individuals should be considered on a case-by-case basis.	Medium (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					• Prior to finalising the sales agreement of land, it should be clear who will assume responsibility for the resettlement of farm workers. • It is recommended that the relocation process be aligned to IFC PS and that a Resettlement Action Plan be developed if it occurs.	
	Nuisance impacts on surrounding land users (mainly noise, blasting, dust, traffic, etc.	Social	Construction	High (negative)	• Refer to each specialist study for specific mitigation measures recommended. • Optimise mine plan/infrastructure placement to avoid/ minimise negative impacts, especially in terms of visual intrusion, displacement, air quality and traffic disruptions. • Undertake continuous information sharing and consultation with adjacent/affected farm owner and the local community. • Implement communication mechanisms to report changes in water quality/quantity, air quality, traffic impacts or vibrations.	Medium to Low (negative)
	Disruption of movement patterns	Social	Construction	Medium (negative)	• Regulation of traffic at intersections at the R543, especially during peak hours. • Inform communities of planned construction activities that would affect vehicle/pedestrian traffic at least ten days in advance. • Measures to prevent deterioration of roads suggested in Traffic Impact Assessment. • Road upgrading measures should be investigated and implemented in conjunction with the relevant government department (SANRAL, MLM). • Ensure that access to key services in areas is uninterrupted.	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	Influx of job seekers	Social	Construction	High (negative)	• Discourage influx of job-seekers by prioritising employment of unemployed members of local communities. • Liaise with local municipalities to ensure that expected population influx is taken into account in infrastructure development and spatial development planning. • Create synergies with local government IDP and other companies' SLP projects to promote infrastructure development. • Identify if recorded criminal activities involved members of the mine's workforce by working with the local police force and the mine's private security. • Clearly identify workers to prevent loitering. • Promote projects providing housing, especially low-cost housing. • Consult with the local community to provide housing for mining work force by means of hostel lodging. • Community education. • Measures to address potential conflict between locals and non-locals.	Medium (negative)
	Increased GDP and production	Economic	Construction	Positive	• Measures to maximise the stimulation of the economy may include procurement of goods and services from local business where feasible. • Recruit local labour. • Sub-contract to local construction companies. • Use local suppliers where viable and arrange with local SMMEs to provide transport, catering and other services for the construction crew.	Positive

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	Employment from construction	Economic	Construction	Positive	• Use labour-intensive construction methods, where feasible. • Sub-contract to local construction companies. • Use local suppliers. • Set-up a skills desk at the local municipal office and in the nearby communities to identify skills available in the community and assist in recruiting local labour during construction and operation.	Positive
	Skills development	Economic	Construction	Positive	• Skills development as per the SLP. • Ensure that the main contractor shares knowledge with the sub-contracting companies during the construction period. • Offer internships and learnerships, especially to those coming from the local communities and HDSA.	Positive
	Household income	Economic	Construction	Positive	• Employ labour intensive methods in construction. • Sub-contract to local construction companies. • Use local suppliers where viable and arrange with local SMMEs to provide transport, catering, and other services for the construction crew.	Positive
	Government revenue	Economic	Construction	Positive	None	Positive
	Sterilisation of productive agricultural land	Economic	Construction	Very high (negative)	• Engage with directly-affected farmers and landowners on alternative farming locations and investigate ways to minimise loss of agricultural production in the surrounding area. • Off-set impact by training local small-scale farmers and workers as stated in SLP in order to have no net loss. • Ensure that land preparation and rehabilitation activities implemented during various stages of the mine's lifecycle allow for land restoration to grazing capacity post-mining.	High (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					• Agricultural crop farming cannot be returned; grazing is suggested.	
	Loss of agricultural work force	Economic	Construction	High (negative)	• Off-set impact by training local small-scale farmers and workers as stated in SLP to have no net loss.	Medium (negative)
	Potential negative impact on property value	Economic	Construction	High (negative)	• Independent appraisals of property and land values in the area adjacent to the site to determine the baseline before the project's implementation is advisable. • Mitigation measures proposed by visual and noise specialists should be strictly adhered to, to minimise the probability and intensity of the visual exposure in the area. • Adequate rehabilitation post-mining is vital to restore the sense of place of the area.	Medium (negative)
	Temporary storage of hazardous products, including fuel and explosives	Social and surface water bodies	Construction	High (negative)	• Bunded area should be constructed for chemical stores to store dangerous goods. • This should not be located in sensitive or buffer areas, especially not within 500 m of watercourses. • Spill kits should readily be available on-site to be used in case of spillage emergency. • Site personnel should be trained in cleaning and removing spillages and monitoring them. • A first aid kit must be available at the site office and personnel must be equipped to deal with medical emergencies.	Medium (negative)
	Chemical toilets on-site	Social and surface water bodies	Construction	Medium (negative)	• There should be a chemical toilet on site for a maximum of 10 people. It must be easily accessible in the construction camp. • Should not be located in sensitive areas or in the 500 m buffer areas, including wetlands and watercourses.	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
					• Should be serviced weekly by a contractor to avoid health issues. • Should always be used by site personnel, i.e. site personnel who do not use them should be penalised.	
	General waste facilities including refuse containers and bins	Social, visual	Construction	Medium (negative)	• A waste contractor should be appointed to provide refuse containers and bins, which should be emptied on a weekly basis to prevent pollution and health issues. • Waste should be disposed of at a registered land fill site and record should be kept of this. • Toxic and chemical waste should be dealt with separately and disposed of in the right manner. Therefore, labelling of waste containers and bins are crucial to avoid contamination. • No littering on site. Any person found littering must be prosecuted.	Low (negative)
	Alteration in surface water drainage patterns and a reduction in the amount of water reaching the W51B & W51C quaternary catchment	Surface water	Construction	High (negative)	• Implementation of the storm water management plan to prevent clean water from flowing into the box cut. Unfortunately, there are no mitigation measures for direct rainfall falling into the box cut. • Water should be reused, as far as possible, and any treated storm flows released downstream. • Backfilling and rehabilitation of old box cuts as mining progresses.	Medium to Low (negative)
	Alteration in surface water drainage patterns resulting in changes to	Aquatic ecology	Construction	Medium (negative)	• Minimise vegetation removal in infrastructure footprint area. • Re-vegetation of the disturbed areas in the construction footprint area once construction is completed. • Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration.	Low (negative)

Activity	Potential impact	Aspects identified	Phase	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	downstream aquatic habitat				• Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events. • Where storm water enters river systems, sediment/silt and debris trapping, and energy dissipation control measures must be put in place. • Storm water must be diverted from construction activities and managed to disperse run-off and prevent the concentration of storm water flow. • The vegetation of unpaved roadsides. • Inspection of paved and unpaved roads to monitor erosion.	
Blasting and development of initial box cut for mining, including stockpiling from initial box-cut	Risk on community health and safety	Social	Construction	High (negative)	• Notification of blasting activities. • Storage of blasting and hazardous materials should adhere to prescribed regulation. • Measures suggested minimising the impact of fly-rock on surrounding roads and structure. • Relocation of structures close to mining operations	Medium to Low (negative)

34 SUMMARY OF SPECIALIST REPORTS

Numerous specialist impact assessments will be undertaken for the proposed project, the specialist reports will include baseline environment, potential impacts and the recommended mitigation measures.

List of studies undertaken	Recommendation of specialist reports	Specialist recommendations included in the EIA report	Reference to applicable section of report with specialist recommendations

Soil Study	➢ Specialists should be used to evaluate the erosion and other possible impacts during the entire development project operation ➢ Limit impacts to the footprints to keep physical impacts as small as possible. Areas for road, site lay-out should be minimized, dust generation. ➢ The proposed mining land should be returned to its original state prior to mining activities, and a soil specialist should assess the rehabilitation performance of the proposed land on an annual basis during the operational phase. ➢ All fuel should be stored safely and according to guidelines. All staff should have completed training in the key areas of working in a mining area. ➢ Firefighting equipment to be included in accordance with client requirements, as well as best practice engineering codes and standards. ➢ Should spillage of hydrocarbons and hazardous waste however occur the area, they must be reported immediately and needs to be cleaned in accordance with the standards of the NEM: WA, 2008. ➢ All affected areas during mining activity were finally rehabilitated on the surface. Once the time is right, unneeded water management facilities will be rehabilitated. During the entire mining process, specialists should be engaged to assess erosion and other potential repercussions.	X	7.3

	➢ The movement of heavy vehicle should be limited to existing roads and be limited to areas where construction of haul road is to take place. ➢ To keep physical consequences to a minimum, limit impacts to footprints. Road areas, site layout, and dust creation should all be limited ➢ Storage of hydrocarbons and explosives must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); Hydrocarbons and explosives storage facilities must be in a hard park bunded facility; and Vehicles with leaks must have drip trays in place. ➢ The mining construction, operation and during decommission must be monitored to ensure that no alien invasive plant species spread or establish, soil compaction and erosion is minimised and sedimentation build-up is prevented or minimised.		

Hydrogeological Study	- Construction should preferably take place in the dry season, as surface water runoff is minimal. - Additional storm water concentration must be contained. - Latrines should be kept away from sensitive drainage areas. Temporary latrines used during construction must be connected to the bulk sewerage lines if possible. Alternatively portable latrines should be sealed units that can be cleaned by truck and the waste must be taken to a suitable sewage facility for treatment. They should be well maintained and regularly cleaned and sewage should not be allowed to directly access the groundwater. Latrines must be used as a priority. “Go to the bush” must be prohibited. - No uncontrolled discharges from the construction camp should be permitted. - All vehicles shall be properly maintained and serviced so that no oil leaks occur on site. - Any stockpiled soil and rock should have storm water management measures implemented. - The large roof structures to be implemented may enhance storm water volumes that need to be managed. - The storm water canal dumping storm water directly on the site must be rerouted. - A storm water plan must be available and used during all the phases of construction.	X	7.5

	➢ Vehicles and machines on site must be maintained properly to ensure that oil spillages are kept at a minimum. ➢ Drip trays must be provided for refuelling of plant vehicles. ➢ The designing of PCDs, Stormwater management areas, should consider the water bodies, slope and climate of the area, to effectively prevent pollution or contamination. ➢ The designing of the infrastructures should take into consideration the gentle slope around the mining right to effectively manage water. ➢ The area falls on weathered aquifer, wastewater should be properly diverted from seepage, as the aquifer is weathered, and contamination is highly likely. ➢ Proper stormwater management is recommended to prevent the risk of water resources contamination. ➢ The mine planning should take into consideration the fracture zones in the Vryheid formation, drilling activities should not contact the fractures as that is where most groundwater in the area is found and to prevent possible groundwater pollution from residual explosive material used. ➢ The numerical model should be recalibrated as soon as more hydrogeological data such as monitoring holes are made available. This would enhance model predictions and certainty. ➢ It is recommended that there should be regular testing or monitoring of surrounding soil, water resources to detect any		

	change in chemistry so that remedial measures are implemented in time. ➢ The monitoring process throughout the existence of the project, the chemical and physical parameters of the water samples should be tested and compared with the SANS 241: 2015 ➢ There should be soil, water resources and land pollution mitigation measures on site. ➢ Wastewater source should be identified, and mitigation measures put in place to prevent groundwater contamination. ➢ The stockpile, there should be regular monitoring of any heavy metal which could be exposed, as such could result in leaching during rainfall. ➢ Proper and competent structure of the tailings dam should be built, to contain liquid, or solid waste and to prevent such waste from entering the outside environment. ➢ According to section 21(S21) of the National Water Act 36 of 1998, if a proposed project triggers any of the listed S21 activities, a water use license must be applied for. For this project, there will be activities which includes abstraction of water from groundwater, mining activities from the water courses dust suppression, dewatering, and ROM stockpiles. It is therefore recommended that a water use license be applied for.		

	➢ it is recommended that to protect the wetlands onsite, it should be made easy to identify them, and further development is required before the operations commence such as planting of various plants. ➢ It is recommended that compliance of relevant legislations be ensured, NEMA Act 107 of 1998, NWA Act 36 of 1998, NEM: waste Management Act 59 of 2008. ➢ it is recommended that during the existence of the project there should also be regular maintenance of the mobile ablutions, to avoid leakage of waste into the ground. ➢ There should be boreholes in and around the mining right area, to monitor the groundwater quality and quantity.		
Palaeontology Study	➢ This project may benefit the community, will create short- and long-term employment, the life expectancy of the community, the growth of the community, and social development in general. ➢ Preferred choice: Locality Option 1 is preferred and possible. ➢ The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, drilling or prospecting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures. ➢ This report must be submitted to SAHRA/PHRA together with the Heritage Impact Assessment Report.	X	Appendix 8

Hydrology Study	➢ the mine planning should take into consideration the fracture zones in the Vryheid formation, drilling activities should not contact the fractures as that is where most groundwater in the area is found and to prevent possible groundwater pollution from residual explosive material used ➢ The numerical model should be recalibrated as soon as more hydrogeological data such as monitoring holes are made available. This would enhance model predictions and certainty. ➢ It is recommended that there should be regular testing or monitoring of surrounding soil, water resources to detect any change in chemistry so that remedial measures are implemented in time. ➢ The monitoring process throughout the existence of the project, the chemical and physical parameters of the water samples should be tested and compared with the SANS241: 2015 ➢ There should be soil, water resources and land pollution mitigation measures on site. ➢ Wastewater source should be identified, and mitigation measures put in place to prevent groundwater contamination. ➢ The stockpile, there should be regular monitoring of any heavy metal which could be exposed, as such could result in leaching during rainfall.	X	Appendix 8

	➢ Proper and competent structure of the tailings dam should be built, to contain liquid, or solid waste and to prevent such waste from entering the outside environment. ➢ According to section 21(S21) of the National Water Act 36 of 1998, if a proposed project triggers any of the listed S21 activities, a water use license must be applied for. For this project, there will be activities which includes abstraction of water from groundwater, mining activities within 100 m from the water courses dust suppression, dewatering, and ROM stockpiles. It is therefore recommended that a water use license be applied for.		

Wetland Study	➢ Storm water diversion measures should be implemented, to adequately control the stormwater onsite. ➢ Availability of absorbent spills to prevent the hydrocarbons from flowing towards the wetlands and preserving the soil on site. ➢ Dust monitoring measures should be implemented, this is to effectively measure the dust being produced, which have the potential of settling in the wetlands. ➢ Prevention measures of erosion should be implemented. ➢ Post mining, rehabilitation should be ensured. ➢ Dust suppression measures should be implemented during the construction and operational phase. ➢ There should be regular maintenance of the mobile ablutions, to prevent spillage of waste into the wetland. ➢ Develop or mining activity should not be allowed unless authorised by the department within the delineated boundary of the wetland identified. ➢ Wetland integrity should be assessed quarterly from the construction phase to post close phase.	X	Appendix 8

Waste Classification	➢ One other option for remediation is to completely remove all the waste material from the site and transport it to another location for treatment and proper disposal. This so-called off-site solution is usually the most expensive option. An alternative is on-site remediation, which reduces the production of leachate and lessens the chance of groundwater contamination. On-site remediation may include temporary removal of the hazardous waste, construction of a secure landfill on the same site, and proper replacement of the waste. It may also include treatment of any contaminated soil or groundwater. Treated soil may be replaced on-site and treated groundwater returned to the aquifer by deep-well injection. ➢ A less costly alternative is full containment of the waste. This is done by placing an impermeable cover over the hazardous-waste site and by blocking the lateral flow of groundwater with subsurface cut-offs walls. It is possible to use cut-off walls for this purpose when there is a natural layer of impervious soil or rock below the site. The walls are constructed around the perimeter of the site, deep enough to penetrate to the impervious layer. They can be excavated as trenches around the site without moving or disturbing the waste material. The trenches are filled with bentonite clay slurry to prevent their collapse during construction, and they are backfilled with a mixture of soil and cement that solidifies	X	26.1

	to form an impermeable barrier. Cut-off walls thus serve as vertical barriers to the flow of water, and the impervious layer serves as a barrier at the bottom. ➢ Before waste is disposed of, the composition, concentration, and toxicity indicators must be determined such that the waste can be classified and rated in accordance with the Minimum Requirements. The Minimum Requirements sets out a systematic framework for identifying whether a waste stream is hazardous and classifying it in accordance with the degree of risk that it poses. From the classification, requirements are set to ensure Hazardous Waste is treated and safely disposed of. These requirements represent the lowest acceptable standard and are therefore termed the Minimum Requirements. ➢ Shale, Sandstone and Sandstone were classified as type 3 waste, these stockpiles need to be lined with a class C lining. According to GNR 636: "Type 3 Waste may only be disposed of at a Class C landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a G: L: B+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (DWAF MR, 1998)". ➢ Therefore, a recommended lining system for this type of waste must be constructed in several steps using relevant materials like the geosynthetic clay liner, high-density		

	polyethylene (HDPE) geomembrane liner, geo composite drainage layer, as well as gravel protective cover. If permeability < 1 x 10-7 cm/s cannot be reached with in-situ material, clay material (600mm) must be imported, or the in-situ material be enriched with bentonite (2 x 150mm layers) minimum 7% bentonite added, refer to Appendix C for examples in the waste classification study.		

Heritage Impact Assessment	➢ It is recommended that SAHRA endorse the report as having satisfied the requirements of Section 38 (8) of the NHRA requirements. ➢ The planners of the mine layout plans must provide for 100m buffer zones from the recorded burial sites. ➢ Given the nature of the study area, a walk down survey must be done by a professional archaeologist once the layout plans for the mine are finalised. This is to ensure that significant heritage resources are identified within the mine footprint. ➢ The public participation process must request landowners and residents to declare graves located within their properties and residences since it was not practical to visit households during the survey. ➢ From a heritage perspective supported by the findings of this study, the Mining Right Application is supported. However, the Mining Right Application should be approved under observation that mining does not extend beyond the area considered in this report/affect the identified heritage sites. ➢ Should chance archaeological materials or human remains be exposed during mining on any section of the site, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations. ➢ Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of	X	8.4.2

	the project EMP, there are no significant cultural heritage resources barriers to the proposed Mining Right Application. The Heritage authority may approve the Mining Right Application as planned with special commendations to implement the recommendations here in made.		
Palaeontology Study	➢ This project may benefit the community, will create short- and long-term employment, the life expectancy of the community, the growth of the community, and social development in general. ➢ The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, drilling or prospecting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures. ➢ This report must be submitted to SAHRA/PHRA together with the Heritage Impact Assessment Report	X	Appendix 8

35 ENVIRONMENTAL IMPACT STATEMENT PLAN

35.1 Summary of the key findings of the Environmental Impact Assessment

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
Site establishment	Loss of topsoil as a resource and soil compaction from heavy machinery and vehicles during site clearance	High (negative)	• Follow adequate stripping guidelines (refer to the Soil study report). • Only remove topsoil when and where necessary. • If possible, topsoil should be stripped during dry months to reduce compaction. • Ensure each topsoil class is stored in one dedicated stockpile, 10 m high and away from surface water bodies. • If any erosion occurs, corrective action must be taken to minimise further erosion from taking place. If erosion has already occurred, topsoil should be sourced, replaced and shaped to reduce the recurrence of erosion. • Only the designated access routes and internal roads are to be used to reduce any unnecessary compaction. • Prevent unauthorised borrowing of stockpiled soil. • Ensure proper storm water management designs are in place	Medium-Low (negative)
	Loss of land capability such as agricultural land and wetland features	High (negative)	Rehabilitate the land back to its original state.	High (negative)
	Loss of natural habitat	Medium (negative)	• Clearings associated with construction must occur in the smallest footprint possible. • Vegetation clearing close to the watercourse should be minimised and, where necessary, appropriate storm water management should be put in place to limit erosion potential of exposed soil. Sedimentation trapping should be in place to prevent exposed soils from spilling into the watercourse. • The watercourse and its buffer areas should be demarcated and fenced-off prior to construction to exclude the watercourse from development activities.	Low (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			• Minimise the development footprint where possible. • Consider layout and site alternatives for the proposed development infrastructure, which needs to be assessed and compared to select the option with the lowest impact.	
	Habitat fragmentation and edge effects resulting in alien plant invasion	Medium (negative)	• Buffer zones are allocated to sensitive or important habitat features to alleviate the effect of habitat loss, habitat fragmentation, disturbances, increased isolation and edge effects. It is suggested that at least a 100 m buffer zone from the drainage line must be implemented as a wildlife support area. • Alien vegetation control should take place pre- and post-construction, as well as during closure and rehabilitation.	Medium-Low (negative)
	Sedimentation of surface water resources resulting in the deterioration of water quality	Medium (negative)	• Development of the storm water management structures to ensure that sediment generated during the construction phase is conveyed to the silt trap, and clean water is diverted away from the box cut and dirty water areas. • Soils compacted by heavy machinery in areas that are not utilised post construction can be ripped to allow infiltration. • Roads should be maintained regularly to ensure that surface water drains freely off the road preventing erosion. Where required, temporary measures should be placed during the construction phase to minimise erosion. • Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events.	Low (negative)
	Movement of heavy machine and vehicles for site clearing resulting in reduced surface water infiltration as well as an alteration in surface water	Medium (negative)	• Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration. • Roads should be maintained regularly to ensure that surface water drains freely off the road preventing erosion. Where required, temporary measures should be implemented during the initial phase to minimise erosion.	Low (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	drainage patterns as a result of soil compaction.			
	Placement of impenetrable surfaces resulting in reduced surface water infiltration and alteration of base flow	Medium (negative)	• Minimise vegetation removal in the infrastructure footprint area. • Re-vegetation of the disturbed areas in the construction footprint areas once construction is completed. • Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration. • Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events. • Where storm water enters river systems, sediment/silt and debris trapping, and energy dissipation control measures must be put in place. • Inspection of paved and unpaved roads to monitor for erosion.	Low (negative)
	Loss of wetland habitat (soils and vegetation)	Very high (negative)	There are no mitigation measures for loss of wetland habitat. It is recommended that the wetland area in question follow the mitigation hierarchy, which includes avoidance, minimisation measures, restoration and biodiversity offsets.	Very high (negative)
	Water catchment and functional watercourses	High (negative)	• The edge of the non-directly impacted wetlands and streams, and at least a 500 m buffer, must be clearly demarcated in the field with wooden stakes painted red as no-go zones that will last for the duration of the construction phase. • Wetland monitoring must be carried out during the construction phase by a qualified wetland/aquatic specialist to ensure no unnecessary impact to wetlands is realised, and if so, that a remedy is put in place as soon as possible. • The Storm Water Management Plan must be adhered to during the construction phase where surface water bodies within 200 m of the construction sites must be highlighted as sensitive receptors and clearly marked.	Medium-Low (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			• An alien and invasive plant species management programme must be in place pre-construction phase.	
	Increased runoff and erosion resulting in habitat change downstream	Medium (negative)	• Apply effective storm water management principles to ensure that clean run-off is maximised and diverted to the receiving water resource, while contaminated run-off is minimised and contained for reuse within the operation. • Development of the storm water management structures to ensure that sediment generated during the construction phase is conveyed to the silt trap, and clean water is diverted away from the box cut and dirty water areas.	Low (negative)
	Increased runoff resulting in reduced base flow and an alteration of aquatic habitats	Medium (negative)	• Minimise vegetation removal in the infrastructure footprint area. • Re-vegetation of the disturbed areas within the construction footprint area once construction is completed. • Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow infiltration. • Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events. • Where storm water enters river systems, sediment/silt and debris trapping, as well as energy dissipation control measures must be put in place. • Storm water must be diverted from construction activities and managed to disperse run-off and prevent the concentration of storm water flow.	Low (negative)
	Infrastructure noticeable to nearby receptors	Medium (negative)	• Vegetation should only be removed when and where necessary. • Topsoil should only be removed when and where necessary. • Topsoil stockpiles should be vegetated with indigenous grasses, like local species of the genera to blend into the surrounding landscape and reduce dust generation. • Limit the footprint area of topsoil stockpiles where possible. • Limit the height of topsoil stockpiles to 10 m.	Low (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	Increased activity noticeable	Medium (negative)	• Where possible, use fencing that will screen the project area from nearby receptors. • Limit the height and footprint area of temporary laydown areas and facilities for construction workers. • Ensure screening vegetation is left intact around the project area and near receptors. • Ensure the surface infrastructure does not exceed the proposed heights. • Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible. • Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used	Low (negative)
	Lighting at night will have a negative visual impact on the receiving environment.	Medium (negative)	• Minimal bright lights should be left on at night time and they should not face outwards of the site. • No work should be carried out during the night. • Reduce exterior lighting to that necessary for safe operation and implement operational strategies to reduce spill light. • Use down-lighting from non-UV lights where possible, as light emitted at one wavelength has a low level of attraction to insects. This will reduce the likelihood of attracting insects and their predators	Low (negative)
	Burial grounds, graves and historical buildings	High (negative)	The surveyed area has no identifiable archaeological remains on the surface, but sub-surface chance finds are still possible. The are 2 recorded burial site that needs to be considered and protected before mining takes place. 100m buffer should be maintained. Therefore, the planners ensure that the graves are protected or relocated in accordance with SAHRA Burial Grounds and Graves Unit regulations and	Medium (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			Section 36 of the NHRA. The historical farmstead must be protected or destroyed upon obtaining of a destruction permit in accordance with Section 34 of the NHRA.	
	Noise emanating from the machinery and vehicles	High (negative)	• Restricting construction activities to daylight hours (06:00 -18:00), excluding weekends and public holidays. • Place diesel generators away from noise-sensitive receptors, place generators on isolation mounts and install secondary silencers. • Machines and vehicles to be serviced according to the requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective. • Reverse alarms on vehicles should be broadband reversing alarms which emit directional, lower, less intrusive sound. • Monitor environmental noise to ensure compliance with the regulations and verify the predicted noise levels. • Switch off equipment when not in use.	Medium (negative)
	Employment creation	Positive	• Assign preferred employment status to those experiencing the bulk of the negative project impacts • Promote local, female and youth employment to achieve and, where feasible, exceed the Mining Charter targets. • Where possible, labour-intensive construction methods should be promoted. • Verification of local residential status through consultation with appropriate authorities (e.g. municipal structures, community leaders, and landowners). • Consult neighbouring businesses/mines to determine if they would be willing to make their skills registers available. • Identify required core skills, expand skills audits to community and align and implement training and skills development initiatives to audit findings. • Expand skills development programmes, especially ABET programmes, to include surrounding communities. • Recruit via a registry of job seekers potentially coordinated through the DoL.	Positive

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			• Provide local employees with certificates of completion for in-house (on-the-job) training. • Monitor subcontractors in terms of local employment targets.	
	Local economy	Positive	• Expand skills development and capacity building programmes to non-employees, especially previously disadvantage individuals. • Establish external monitoring system to regulate HDSA procurement. • Where feasible, training should be NQF-accredited. • Keep a record of training courses completed per individual. • Liaise with beneficiaries to ensure needs are met. • Collaborate with other developmental role players during implementation.	Positive
	Community development and social upliftment	Positive	• Expand skills development and capacity building programmes to non-employees, especially previously disadvantage individuals. • Establish external monitoring system to regulate HDSA procurement. • Where feasible, training should be NQF accredited. • Keep a record of training courses completed per individual. • Liaise with beneficiaries to ensure needs are met. • Collaborate with other developmental role players during implementation.	Positive
	Displacement of locals	High (negative)	Lazalelihlokohloko Mining and Projects should, where possible, endeavour to minimise the extent of displacement through project design. Where displacement cannot be minimised, the following measures are recommended to alleviate adverse impacts: • Finalise the project layout plan and determine its policy and approach to displacement, especially farm workers located in the Piet Retief area. • The sales agreement of land purchased should reflect the holistic value of the land (determined by a professional valuer) and include the potential relocation cost of commercial farms and/or business operations.	Medium (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			• The displacement of non-vulnerable households and individuals should be considered on a case-by-case basis. • Prior to finalising the sales agreement of land, it should be clear who will assume responsibility for the resettlement of vulnerable households, including farm workers. • It is recommended that the relocation process be aligned to IFC PS and that a Resettlement Action Plan be developed.	
	Nuisance impacts on surrounding land users (mainly noise, blasting, dust, traffic etc.)	High (negative)	• Refer to each specialist study on Appendix 8 for specific mitigation measures. • Optimise mine plan/infrastructure placement to avoid/minimise negative impacts, especially in terms of visual intrusion, displacement, air quality and traffic disruptions. • Undertake continuous information sharing and consultation with adjacent/affected farm owners and the local community. • Implement communication mechanisms to report changes in water quality/quantity, air quality, traffic impacts or vibrations.	Medium-Low (negative)
	Disruption of movement patterns	Medium (negative)	• Regulate traffic along the R543, especially during peak hours. • Inform communities of planned construction activities that will affect vehicle/ pedestrian traffic at least ten days in advance. • Evaluate measures to prevent deterioration of roads suggested in Traffic Impact Assessment. • Road upgrading measures should be investigated and implemented in conjunction with the relevant government department. • Ensure that access to key services in areas is uninterrupted.	Low (negative)
	Influx of job seekers	High (negative)	• Discourage influx of job-seekers by prioritising employment of unemployed members of local communities. • Liaise with local municipalities to ensure that expected population influx is taken into account in infrastructure development and spatial development planning.	Medium (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			• Create synergies with local government IDP and other companies' SLP projects to promote infrastructure development. • Identify if recorded criminal activities involved members of the mine's workforce by working with the local police force and the mine's private security. • Clearly identify workers to prevent loitering. • Promote projects providing housing, especially low-cost housing. • Consult with the local community in terms of providing housing for mining work force by means of hostel lodging. • Community education. • Measures to address potential conflict between locals and non-locals.	
	Increased GDP and production	Positive	• Measures to maximise economic stimulation may include procurement of goods and services from local business, where feasible. • Recruit local labour. • Sub-contract to local construction companies. • Use local suppliers where viable and arrange with local SMMEs to provide transport, catering and other services for the construction crew.	Positive
	Employment from construction	Positive	• Use labour-intensive construction methods, where feasible. • Sub-contract to local construction companies. • Use local suppliers. • Set-up a skills desk at the local municipal office and in the nearby communities to identify skills available in the community and assist in recruiting local labour during construction and operation.	Positive
	Skills development	Positive	• Enable skills development as per the SLP. • Ensure that the main contractor shares knowledge with the sub-contracting companies during the construction period.	Positive

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			• Offer internships and learnerships, especially to those coming from the local communities and HDSAs.	
	Household income	Positive	• Employ labour-intensive methods in construction. • Sub-contract to local construction companies. • Use local suppliers, where viable, and arrange with local SMMEs to provide transport, catering and other services for the construction crew.	Positive
	Government revenue	Positive	None	Positive
	Sterilisation of productive agricultural land	Very High (negative)	• Engage with directly-affected farmers and landowners on alternative farming locations and investigate ways to minimise loss of agricultural production in the surrounding area. • Off-set impact by training local small-scale farmers and workers as stated in the SLP to prevent net loss. • Ensure that land preparation and rehabilitation activities implemented during various stages of the mine's lifecycle allow for restoration of land to grazing capacity post-mining. • Agricultural crop farming cannot be returned; grazing is suggested.	High (negative)
	Loss of agricultural work force	High (negative)	Off-set impact by training local small-scale farmers and workers as stated in SLP in order to prevent net loss.	Medium (negative)
	Potential negative impact on property value	High (negative)	• Independent appraisals of property and land values in the area adjacent to the site to determine the baseline before the project's implementation is advisable. • Mitigation measures proposed by specialists should be strictly adhered to, to minimise the probability and intensity of the visual exposure in the area.	Medium (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
			• Adequate rehabilitation post-mining is vital to restore the sense of place of the area.	
	Temporary storage of hazardous products, including fuel and explosives	High (negative)	• Bunded areas should be constructed for chemical stores and storage of dangerous goods. • This should not be located in sensitive or buffer areas, especially not within 500 m of watercourses. • Spill kits should readily be available on-site in a case of a spillage emergency. • Site personnel should be trained in cleaning and removing spillages. • A first aid kit should be available at the site office and personnel must be equipped to deal with medical emergencies.	Medium (negative)
	Chemical toilets on site	Medium (negative)	• There should be a chemical toilet on-site for a maximum of 10 people, easily accessible in construction camp. • This toilet should not be located in sensitive areas or within 500 m of buffer areas, including wetlands and watercourse. • Toilet must be serviced by a contractor on a weekly basis to avoid health issues. • This toilet must always be used by site personnel; site personnel who do not use them should be penalised.	Low (negative)
	General waste facilities including refuse containers and bins	Medium (negative)	• A waste contractor should be appointed to provide refuse containers and bins, which should be emptied weekly to prevent pollution and health issues. • Waste should be disposed of at a registered land fill site and record should be kept of this. • Toxic and chemical waste should be dealt with separately and disposed of in the right manner. Labelling of waste containers and bins are crucial to avoid contamination. • No littering on-site. Any person found littering should be prosecuted.	Low (negative)

Activity	Potential impact	Significance prior to mitigation	Mitigation type	Significance post-mitigation
	Alteration in surface water drainage patterns and a reduction in the amount of water reaching the X11A quaternary catchment	High (negative)	• Implementation of the storm water management plan to prevent clean water from flowing into the box cut. Unfortunately, there are no mitigation measures for direct rainfall falling into the box cut. • As far as possible, water should be reused and any treated storm flows released downstream. • Backfilling and rehabilitation of old box cuts as mining progresses.	Medium-Low (negative)
	Alteration in surface water drainage patterns resulting in changes to downstream aquatic habitat	Medium (negative)	• Minimise vegetation removal in the infrastructure footprint area. • Re-vegetation of the disturbed areas in the construction footprint area once construction is completed. • Soils compacted by heavy machinery in areas that are not utilised post-construction can be ripped to allow for infiltration. • Ensure that storm water management structures are in good working condition through regular inspection, especially after large storm events. • Where storm water enters river systems, sediment/silt and debris trapping, as well as energy dissipation control measures must be put in place. • Storm water must be diverted from construction activities and managed in such a manner to disperse run-off and prevent the concentration of storm water flow. • The vegetation of unpaved roadsides. • Inspection of paved and unpaved roads to monitor for erosion.	Low (negative)
Blasting and development of initial box cut for mining, including stockpiling from initial box-cut	Risk on community health and safety	High (negative)	• Notification of blasting activities. • Storage of blasting and hazardous materials should adhere to prescribed regulation. • Minimise the impact of fly-rock on surrounding roads and structure. • Relocate structures close to mining operations.	Medium-Low (negative)

36 FINAL SITE MAP

The final proposed infrastructure layout plan is provided in **Figure 74.**

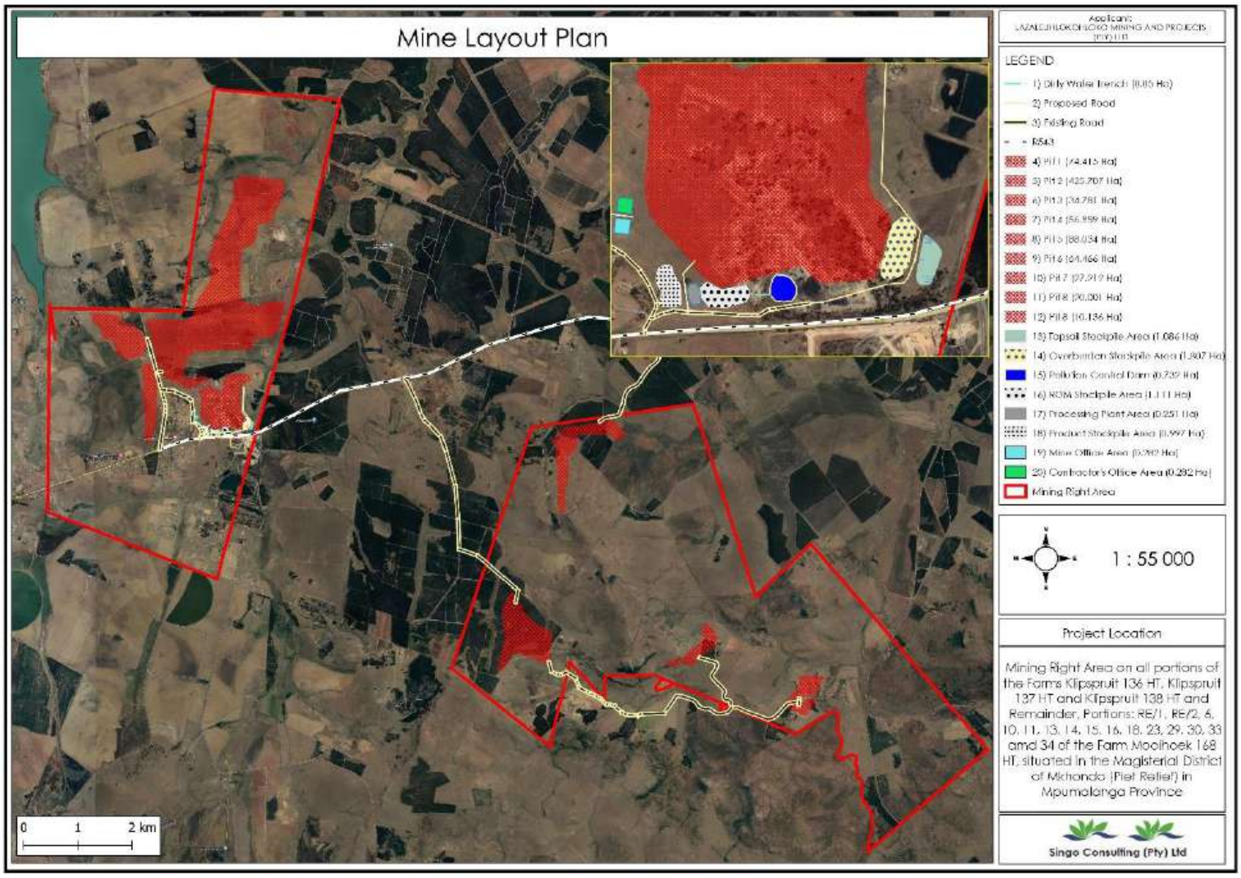


Figure 74: Final site map. [Singo Consulting,2022].

37 SUMMARY OF IMPLICATIONS AND RISKS OF THE PROPOSED ACTIVITY AND ALTERNATIVES

The positive and negative implications were assessed according to the construction, operational and decommissioning phases of the proposed project. A description of the main impacts is provided in the previous section. A short summary is provided in this section for each project phase.

37.1 Construction phase

During the construction phase of the proposed project, the majority of the negative impacts are associated with site clearance and vegetation removal. Topsoil loss should be limited by storing and protecting the topsoil for rehabilitation purposes. The establishment of the proposed project will result in loss of wetland habitat. Although the wetlands are not considered pristine, they provide suitable habitat for fauna species.

The loss of these wetland habitats is an irreversible negative implication of major significance associated with the proposed project.

Site clearance and vegetation removal will result in a loss in land capability. The affected land will transform from agricultural use to mining use, which is an irreversible negative impact. Natural vegetation removal is minimal, as the majority of the land is used for agriculture. Alteration of the sub-catchment and the subsequent amount of water reporting to the W51C quaternary catchments (which comes from the Inkomati Usuthu Water Management Area), as well as increased sedimentation of surface water resources (which may also impact aquatic biota) is considered a moderate negative impact. The implementation of mitigation measures, like commencing rehabilitation activities immediately following construction will, however, reduce the impact to minor negative significance. The main negative implications associated with other general construction activities of moderate negative significance include nuisance noise, dust and visual impacts.

From a socio-economic perspective, the development of the mine will have a positive impact on employment creation, economic and social upliftment and community development. An increase in employment opportunities, household income and skills development will contribute to a positive growth in the local economy. Major negative social impacts are expected due to the displacement of households in the proposed footprint area.

37.2 Operational phase

The majority of the impacts identified for the operational phase are associated with open-cast mining. Initial box-cut removal will negatively impact agricultural land and patches of semi-natural (although disturbed) grassland. Mining will cause perforation of rock and groundwater reserves leading to severe hydrological and geomorphological impacts to wetlands and catchment due to draw-down cone. Blasting activities associated with open-pit mining may have significant implications (moderate negative impact), including ground vibration and flyrock impacts at surrounding settlements With the implementation of mitigation measures and proper blast designs, these impacts can be reduced to minor negative significance.

The operation of surface infrastructure may lead to water quality deterioration. Stormwater management measures will be in place to separate clean and dirty water. Run-off emanating from surface infrastructure will be contained in the PCD as far as possible. This, in turn, will result in the reduction of catchment yield. Topsoil loss has been identified as a potential impact of moderate significance during the operational phase as a result of rainwater run-off and wind erosion from roads and soil stockpiles. In addition, alien vegetation may establish on the topsoil. This can be prevented by planting an indigenous grass mixture, which will assist in erosion reduction.

Similar to the construction phase, nuisance noise, dust and visual impacts of moderate negative significance are expected from general operation activities, like loading, hauling and stockpiling overburden and RoM. All of these impacts can be mitigated.

Employment creation during operation, as well as stimulation and growth of the local and regional economies will be a continued and more positive social impact of the operational phase. Additionally, local

SMMEs will indirectly benefit from the operational phase of the mine. The community will also benefit from community projects, which should improve their wellbeing.

37.3 Decommissioning phase

During the decommissioning phase, positive impacts will occur from rehabilitation activities, including the restoration of land capability to its pre-mining state or agreed-upon alternative, the restoration of vegetation and habitat types, as well as the rehabilitation of infrastructure footprint areas. The expected negative impacts are associated with the movement of machinery to dismantle and remove equipment and infrastructure and rehabilitate the disturbed areas. Negligible to moderately negative impacts resulting from soil loss, erosion and dust emissions were identified. Moderate negative social impacts are expected when mining operations cease, as a dependency on the mine for sustaining local economy would have been established.

Post-closure monitoring is essential to determine if rehabilitation was successful and sustainable. The most significant impact includes the potential for decant of groundwater, which may result in AMD which could potentially have a major negative impact on surface and groundwater quality, approximately 50 years after LoM.

38 PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR

The EMP seeks to achieve a required end-state and describes how activities that have, or could have, an adverse impact on the environment and surrounding communities will be mitigated, controlled and monitored. The EMP will address the environmental impacts and possible unplanned events during each project phase (construction, operational, decommissioning and post-closure). Due regard must be given to environmental protection during the entire project; a number of environmental recommendations are made to achieve environmental protection.

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts, assess their significance and implement appropriate mitigation and management measures to avoid, minimise and/or remediate the associated impacts where they cannot completely be avoided.
- Implement an adequate monitoring programme to:
  - Ensure that mitigation and management measure are effective.
  - Allow quick detection of potential impacts, which will allow for quick responses to issues/impacts.
  - Reduce duration of any potential negative impacts.

39 FINAL PROPOSED ALTERNATIVES

The location of the project was selected based on the location of the identified coal seams. Alternatives were therefore assessed for the project layout with consideration given to the environmental and technical assessments undertaken. The final proposed layout (**Figure 74**) aims to ensure that infrastructure is placed in such a manner to avoid and minimise potential environmental impacts.

The mine design has been altered to avoid certain sensitivities. Based on the mitigation hierarchy, rehabilitation is required, and where this is not feasible, biodiversity offsets need to be considered as discussed with Department of Water and Sanitation (DWS). Where impacts cannot be avoided, mitigation and management measures have been provided to lessen the significance of the adverse impacts.

If the mining project is to go ahead, the mine will need to make provision for long-term water quality impacts and remediation thereof. This is particularly related to potential decant of acidic underground water post-mining. It can be concluded that the project will have a residual negative impact on the wetlands and their catchment areas. Lazalelihlokohloko Mining and Projects will need to take this into consideration and manage the residual impact with adequate rehabilitation actions and, if need be, with an offsetting strategy to ensure no nett loss of wetland functionality is realised. Should the project be approved, this needs to be discussed in detail with DWS prior to commencement of construction activities.

40 ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

The studies and impact assessment are based on the proposed mine layout and mine work programme. Should there be any changes to the proposed project description, the adequacy and accuracy of the work may be affected, and additional work may be required to fill in the gaps. The economic component of the study was not done on a macro-scale, and therefore valuations of property were excluded. This needs to be done prior to settling deals with the landowners to make it a fair and reasonable offer.

41 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

Each specialist assessment had its own assumptions, uncertainties, limitations and knowledge gaps, and are indicated in the following.

41.1 Aquatic and surface water assessment

The field assessment was restricted to those watercourses likely to be impacted by mining activities, which include the open cast pits and associated infrastructure. The following findings were made:

- The accuracy of wetland delineations was based primarily on the recording of on-site wetland terrain and vegetation indicators (terrain and vegetation) using a GPS. GPS accuracy will influence the accuracy of the mapped sampling points and therefore water resource boundaries and an error of 1-5m can be expected. All vegetation and terrain sampling points were recorded using a Garmin Montana™ GPS and captured using GIS for further processing.
- Wetland soil indicators were used to verify delineated boundaries where necessary. Given the scale of the assessment and the number of wetlands present, this was not used as a primary means of delineation. In addition, historical agricultural activities made it very difficult to identify the original delineation of certain wetland types (e.g. wetland flats). In this respect.
- Although every effort was made to correctly identify the plant species encountered on-site, the author is not a botanist and experience in plant identification is limited to facultative wetland and obligate wetland plants. Therefore, it is possible that some plants may have been overlooked and others may have been incorrectly identified, particularly dryland plant species.
- No wetland fauna sampling or faunal searches were conducted. The assessment was purely habitat-focussed.
- Since ecology is dynamic and complex, some aspects (some of which may be important) may have been overlooked. Similarly, sampling by its nature, means that generally not all aspects of ecosystems can be assessed and identified.
- The PES and EIS assessments undertaken are largely qualitative assessment tools and thus the results are open to professional opinion and interpretation. An effort has been made to substantiate all claims where applicable and necessary.

41.2 Blasting and vibration

This assessment does not aim to calculate exact vibration levels or the precise level of air overpressure. Instead, it uses various tools to identify potential concerns. Due to unknowns, this assessment leans towards a cautious approach, rather over-estimating the distance that fly-rock may travel, the ground vibration or the level of airblast. The following assumptions and limitations must be noted:

- The project is a greenfield project with no drilling and blasting operations currently active.
- The anticipated levels of influence estimated in this report are calculated using standard accepted methodology according to international and local regulations.

- The assumption is made that the predictions are a good estimate with significant safety factors to ensure that expected levels are based on worst-case scenarios. These will have to be confirmed with actual measurements once the operation is active.
- The limitation is that no data is available from this operation to confirm the predicted values, as it is a greenfield site with no current blasting activities.
- This report assumes that blasting will take place during the afternoon when atmospheric conditions are most unstable; a potential inversion layer is high with no overcast conditions.

41.3 Hydrogeological assessment

The modelling was done within the limitations of the scope of work of this study and the amount of data available. Although all efforts were made to base the model on sound assumptions and although it has been calibrated to observed data, the results obtained from this exercise should be considered in accordance with the assumptions made. The assumption that a fractured aquifer will behave as a homogeneous porous medium can, especially, lead to error. However, on a large enough scale (bigger than the Representative Elemental Volume (REV)), this assumption should hold reasonably well.

41.4 Noise

Measurements of ambient sound levels

- Ambient sound levels are the cumulative effects of innumerable sounds generated at various instances, both far and near. High measurements may not necessarily mean that noise levels in the area are high. Similarly, a low sound level measurement will not necessarily mean that the area is always quiet, as sound levels will vary over seasons, time of the day, faunal characteristics, vegetation in the area and meteorological conditions (especially wind). This excludes the potential effect of sounds from anthropogenic origin. It is impossible to quantify and identify the numerous sources that influenced a measurement using the reading result at the end of the measurement. Therefore, trying to define ambient sound levels using the result of one ten-minute measurement can be inaccurate (very low confidence level in the results) for the aforementioned reasons. The more measurements that can be collected at a location, the higher the confidence levels in the ambient sound level determined. The more complex the sound environment, the longer the required measurement. When singular measurements are used, a precautious stance must be adopted (as done in this report).
- It is assumed that the measurement locations represent other residential dwellings in the area (similar environment), yet, in practice, this can be highly erroneous as there are numerous factors that can impact ambient sound levels, including:
    - The distance to closest trees, number and type of trees, as well as the height of trees
    - Available habitat and food for birds and other animals
    - Distance to residential dwelling and type of equipment used there (compressors, air-con)
    - General maintenance condition of house (especially during windy conditions)
    - Number and type of animals kept in the vicinity of the measurement locations (typical land use taking place around the dwelling)

- Exact location of a sound level meter in an area in relation to structures, infrastructure, vegetation and external noise sources will influence measurements. It may determine whether one is measuring anthropogenic sounds from a receptor's dwelling, or environmental ambient soundscape contributors of significance (faunal, road traffic, railway line movement, etc.). At times, there are extraneous noises that cannot be heard during deployment, or operations, which can significantly impact readings (like water pumps, transformers, faunal communication, etc.).

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

42.1 Reasons why the activity should be authorised or not

Various specialist studies were undertaken during the EIA phase of the proposed project with the objective of identifying and weighing anticipated impacts and risks associated with the mining activities. These studies were conducted in accordance with all relevant legislative requirements.

The findings of the impact assessment show that the proposed project will have adverse impacts on the receiving environment, including:

- The loss of high potential agricultural land to open pit mining (land use change).
- An irreversible impact to the land use and the overall land capability as the soil cannot be rehabilitated to cultivated land. At best, it can be reused for grazing purposes.
- The loss of wetland habitat for the creation of the open cast mining blocks. This includes loss of vulnerable habitat.
- Reduction in catchment yields as dirty water run-off in the mine will be contained in the designed PCDs. Groundwater loss and flow from the pit will also contribute to base flow reduction.
- Nuisance noise, dust and visual impacts were detected.
- The project will impact burial grounds, graves and historical buildings located near the open cast mining blocks.
- Where possible, mitigation and management measures, no-go areas, and further recommendations were recommended by specialists to reduce the significance of these impacts to minor or negligible significance. These recommendations include:
  - All watercourses should be buffered by 500 m, which should be clearly demarcated as no-go areas and sensitivity receptors.
  - Berms must be maintained as a buffer between the coal handling area and the sensitive receiving environment.
  - Re-vegetate the rehabilitated areas with an indigenous grass mixture. Consultation with an ecologist is suggested prior to revegetation at project cessation.
  - Burial sites, graves and historical buildings should be protected in situ and the necessary legislation must be followed if this is not possible.

Monitoring plans, which should be implemented throughout the LoM, have been provided to ensure that adverse impacts are recognised and continuous improvements are developed. With the correct mitigation and management measures, including the incorporation of the 500 m buffer around the identified wetland units, as well as other proposed buffers (see the following section), the mining operations could be feasible. The only fatal flaw is the loss of some wetland habitat, which would require rehabilitation or an offset agreement as it cannot be mitigated.

Several mining right applications are in progress or have been approved recently in the surrounding areas of the proposed project. Therefore, it may be investigated to determine possible positive impacts that could be cumulated on a regional level between all the mining houses.

42.2 Conditions that must be included in the authorisation

42.2.1 Specific conditions to be included in the compilation and approval of the EMPr

The following specific conditions are proposed:

- All mitigation measures proposed in this report should be implemented.
- All buffer areas indicated for features should be implemented and avoided. Where avoidance is not possible, alternatives like rehabilitation or offset agreements must be reached. In the case of historical buildings and graves, the relevant authority needs to be contacted and the required legislative processes should be followed.
- Environmental monitoring should take place as recommended.
- All flora and fauna Species of Conservation Concern must be relocated by a qualified specialist as part of a relocation and monitoring plan prior to construction activities. No faunal species may be hurt, killed or captured during the project's construction or operational phase.
- A grievance system or communication platform must be established to create a forum for the public to interact with the mining house.
- The PCDs must be designed and operated in such a way that it will not spill more than once in 10 years. The dam must be able to contain the water required for operations and a storm event, including a 0.8 m freeboard at all times.
- A Resettlement Action Plan must be developed and agreed upon with affected parties prior to displacement-related activities.
- A Water Use License (WUL) must be obtained prior to water uses being undertaken.
- Update the numerical and geochemical model against monitored data during operations every year.
- The hydrocensus and risk assessment should be repeated at least once before closure to evaluate any impacts.
- The closure cost assessment should be updated and submitted as per legislative requirements.

42.2.2 Rehabilitation requirements

The post-mining land use should be restored to grazing and/or cultivation and should represent the pre-mining land use as far as possible.

Rehabilitation of the project will aim to:

- Ensure that the final elevation around the site is free-draining.
- Ensure that soil is replaced in the same sequence to ensure soil characteristics are retained as far as possible.

- Ensure a self-sustaining post-mining land capability similar to pre-mining of grazing and limited low-intensity arable lands.
- Ensure that the rehabilitated areas are cleared of all contaminating substances and that run-off from the area is returned to the natural catchment.
- Ensure that vegetation growth and cover on the rehabilitated areas is sustainable, that local indigenous species are established on the site, and that succession and colonisation from surrounding areas take place on rehabilitated areas. Ecological and ecosystem processes should function optimally after a prescribed period.
- Ensure that alien invasive species are eradicated until the closure certificate is granted.
- Draft the rehabilitation model before final rehabilitation activities commence.
- Ensure that site rehabilitation can be undertaken responsibly; soils must be stripped and stockpiled separately. This will ensure preservation of soil for re-use in site rehabilitation.
- The discard dump will be a permanent feature, as will the associated storm water management features around the dump, including the PCD. It is anticipated that the main access road to site, and the roads to the mine residue dump be retained to undertake the necessary post-closure monitoring.

The project's closure and rehabilitation objectives are as follows:

- Achieve a final land use that is sustainable and meets legislative requirements and stakeholder needs.
- Maintain and monitor all rehabilitated areas following re-vegetation and, if this monitoring shows that the objectives have been met, make an application for closure.
- Comply with local, district and national regulatory requirements.
- Follow a comprehensive consultation and communication process with all stakeholders.

43 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The anticipated mining operations, excluding construction and decommissioning, are anticipated to be maintained for a period of 30 years. The total LoM has been calculated at 30 years, with construction, decommissioning and rehabilitation.

44 UNDERTAKING

Please refer to Section 49 for the complete undertaking applicable to the EIA and EMPr sections of this report.

45 FINANCIAL PROVISION

The financial provision was calculated according to Regulation 6 of the Financial Provision Regulations (2015/ 2018) which prescribe the minimum content requirements.

45.1 Quantum costing

The quantum costing for year 1 has been determined by the applicant and provided as **R6 184 837.00** (Item 3(s)(i). The following explains how the aforesaid amount was derived.

The environmental liability only focused on the proposed mining activities and was calculated by means of the DMRE standard method for assessment of mine closure. The areas for the mine which needed to be included in the current assessment were provided to Singo Consulting by the applicant (Lazalelihlokohloko Mining & Projects), as indicated in the MWP. These areas were assumed to be all that the applicant was liable for and no investigation was conducted to determine whether the applicant is responsible for or has any liabilities for additional areas. Activities incorporated into the calculation include the demolition and management of physical infrastructure, rehabilitation of the waste facilities, and the rehabilitation of these affected areas.

Only the area affected by the proposed mining block and associated infrastructure are included. Should additional mining blocks and infrastructure be identified during future exploration activities, these needs will be included.

The master rates will be updated on an annual basis (based on CPIX or a similar approved method), or should legislation change. The first of these updates will take place and continue during the period in which the review is taking place. The overall document will be reviewed and updated whenever necessary (minimum requirement of annual updates).

Table 50: Quantum calculation

CALCULATION OF THE QUANTUM

LAZALELIHLOKOHLOKO MINING AND PROJECTS (PTY) LTD

Applicant:
Evaluator: Abel Mojapelo

DMRE REF No: IMP 30/5/1/2/3/2/1(10230) MR
Date: Nov-22

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0,251	17,14	1	1	4,30214
2 (A)	Demolition of steel buildings and structures	m2	0	238,71	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	351,79	0,1	1	0
3	Rehabilitation of access roads	m2	0,8118	42,72	1	1	34,680096
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414,61	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226,15	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	477,42	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	801,716	242984,15	0,01	1	1948042,808
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	5,001	166847,44	0,07	1	58408,28332
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	207805,47	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,732	603565,59	1	1	441810,0119
9	Rehabilitation of subsided areas	ha	0	139709,6	1	1	0
10	General surface rehabilitation	ha	808,308	132171,31	0,01	1	1068351,272
11	River diversions	ha	0	132171,31	1	1	0
12	Fencing	m	0	150,77	1	1	0
13	Water management	ha	0,782	50255,25	1	1	39299,6055
14	2 to 3 years of maintenance and aftercare	ha	808,308	17589,34	0,06	1	853056,2542
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		4409007,218

1	Preliminary and General	529080,8661	weighting factor 2 1	529080,8661
2	Contingencies		440900,7218	440900,7218
			Subtotal 2	5378988,81
			VAT (15%)	806848,32
			Grand Total	6185837

SIGN Abel Mojapelo
DATE 2022/11/11

45.2 Confirm that this amount can be provided for from the operating expenditure

Provided the mining right is approved, Lazalelihlokohloko Mining and Projects will provide for closure as per the legal requirements. A liability assessment will need to be undertaken annually to ensure the financial provision is in line with the closure cost thus it is confirmed that Lazalelihlokohloko Mining and Projects will provide the stated amount.

46 DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY

46.1 Deviations from the methodology used in determining the significance of potential environmental impacts and risks

There were no deviations from the plan of study as stipulated in the SR.

46.2 Motivation for the deviation

There were no deviations from the plan of study as stipulated in the SR.

47 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Compliance with the provision of Section 24(4)(a) and (b), read with Section 24 (3) (a) and (7) of the NEMA, the EIA report must include the following:

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

The potential socio-economic impacts expected to arise as a result of the proposed project have been investigated and assessed in the SLP.

People in the vicinity of the mine will experience the positive and negative impacts of the proposed project. Physical displacement of households located in the direct footprint of the proposed pit has been identified as a major adverse socio-economic impact. Mitigation measures, namely the development of a Resettlement Action Plan and grievance mechanism have been proposed. The proposed Coal Mine will provide employment opportunities, skills development, social development programmes, community upliftment and economic stimulation to the area.

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

An HIA will be undertaken during the EIA phase of the project . The HIA specialist attests to the fact that the project area may have been located in a rich LIA landscape. As such, there is potential for encountering subsurface LIA remains ranging from medium to high on the proposed mining development site.

The proposed project will result in a direct negative impact on burial grounds, graves and historical buildings located in the proposed open cast mining blocks and infrastructure. This will have irreversible impacts on these resources. No action can, however, take place before a permit is obtained (if need be) that they must be relocated.

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

Section 24(4)(b)(i) of the NEMA (as amended), requires that an investigation be undertaken to determine the potential consequences or impacts of the alternatives on the activity in the environment. It is further required that an assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity, be conducted. A location alternative is not feasible, as mentioned and discussed before. All other alternatives have been discussed in detail in Section 5.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

49 DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

49.1 Details of the EAP

Lazalelihlokohloko Mining and Projects has appointed Singo Consulting as an independent EAP to undertake an S&EIA to support the application for a mining right. Singo Consulting has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations. For purposes of this S&EIA, the following person may be contacted at Singo Consulting:

Table 51: Contact details of the Environmental Technician & EAPs

Environmental assessment practitioner	Singo Consulting (Pty) Ltd
Contact person(s)	Abel Mojapelo (Environmental Technician) Rudzani Shonisani (1st Reviewer) Dr Kenneth Singo (2nd Reviewer & Principal EAP)
Physical address	Office No: 870, 5 Balalaika Street, Tasbet Park Ext 2, Witbank, 1035
Postal address	C/o P/Bag X7214, Postnet Suit 125, Ben Fleur, Witbank 1035
Contact number(s)	Abel Mojapelo: +27 71 362 7894 Rudzani Shonisani : +27 78 548 1244 Dr Kenneth Singo: +27 78 272 7839 / +27 72 081 6682
Telephone number	+27 13 692 0041
Fax	+27 86 5144 103
Email(s)	Abel Mojapelo: abel@singoconsulting.co.za Rudzani Shonisani :rudzani@singoconsulting.co.za Dr Kenneth Singo: kenneth@singoconsulting.co.za

50 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

Refer to Part A for the list of aspects associated with the proposed project.

51 COMPOSITE MAP

See Figure 75 for the composite map. A buffer was applied at a sensitive areas.

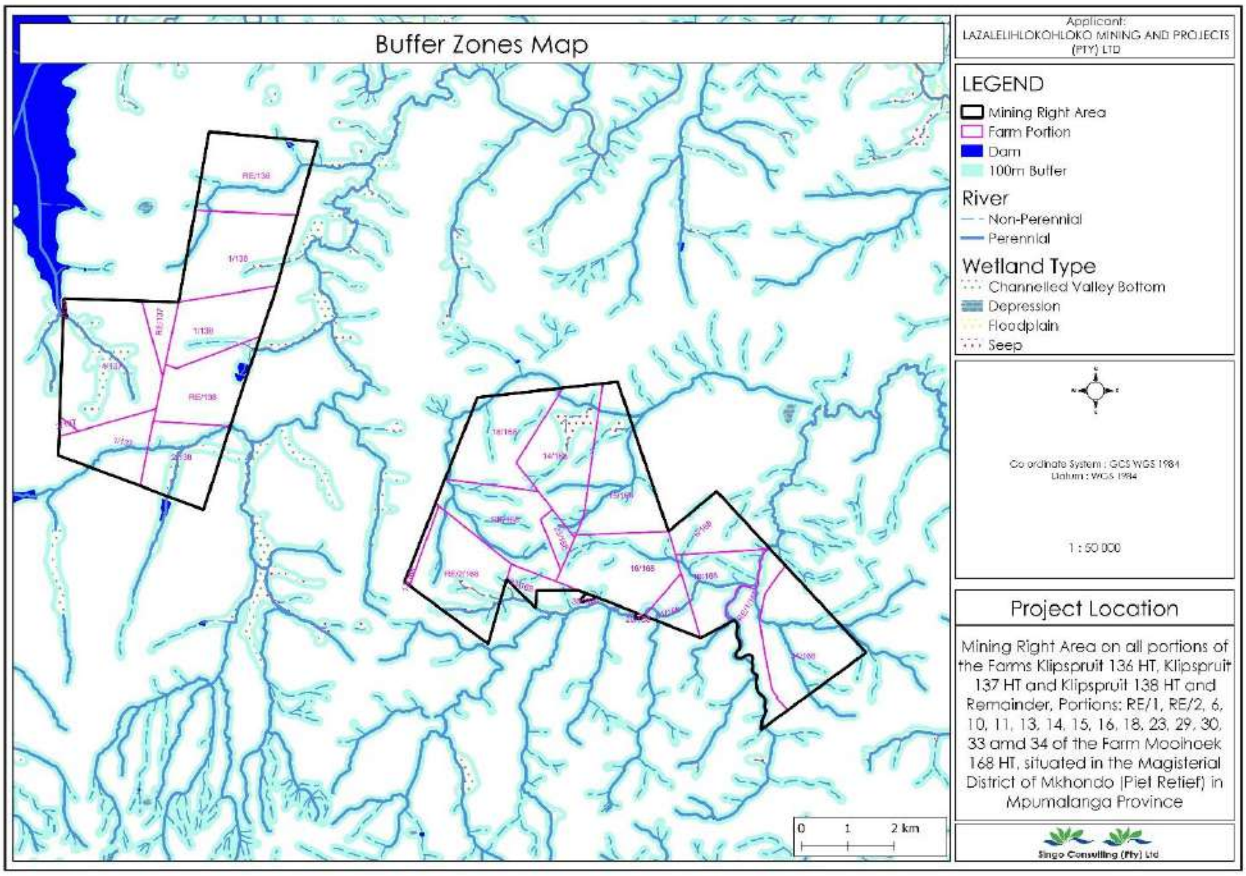


Figure 75: Composite map (i.e. buffer sensitiveness in the proposed mining area).[Singo Consulting,2022].

52 DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES, INCLUDING MANAGEMENT STATEMENTS

52.1 Determination of closure objectives

Closure and rehabilitation is a continuous series of activities that begin with planning prior to the project's design and construction, and end with achievement of long-term site stability that creates a safe, physically-stable, rehabilitated landscape that limits long-term erosion potential and environmental degradation, and restores the land to pre-mining conditions as far as possible.

The following points outline the main objectives for rehabilitation and closure:

- Achieve a final land use that represents pre-mining conditions that is sustainable and meets both legislative requirements and stakeholder needs.
- Create opportunities for alternative post-mining livelihoods by aligning to the regional planning.
- Ensure interconnectivity between the rehabilitated landscapes with surrounding regionally biologically diverse areas.
- Encourage, if and where required, the re-instatement of terrestrial and aquatic wetland biodiversity over time.
- Maintain and monitor all rehabilitated areas following re-vegetation and establishment of landscape features like wetland pans. If this monitoring shows that the objectives have been met, make an application for closure.
- Prevent/minimise negative impacts and risks as identified in this report and specialist reports.
- Comply with local, district, provincial and national regulatory requirements.
- Follow a comprehensive consultation and communication process with all stakeholders.

52.2 Process for managing environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation

An Environmental Response Plan (ERP)/Emergency preparedness plan (EPP) is a process to respond rapidly and effectively to and manage emergency situations that may arise at the mine. The Emergency Preparedness and Response Code of Practice will be compiled in accordance with the following:

- Occupational Health and Safety OHSAS 18001
- The Mine Health and Safety Act, 1996 (Act No. 29 of 1996)

In the event of an emergency, the ERP and applicable Procedure will be consulted and the required actions implemented. To facilitate the effective implementation of the procedures, copies of the ERP will be placed in accessible and visible locations around the site, like the site office and contractors' yard. The applicant will ensure that employees and contractors are adequately trained with regard to the implementation of the EMPr, environmental legal requirements and obligations, and the ERP.

Environmental awareness is applicable to all project-involved personnel, as well as part-time personnel who will be trained so that they are aware of environmental obligations by the time they visit the site. An Environmental Awareness Practitioner or Environmental Control Officer (ECO) will be appointed to conduct training during site establishment and will be responsible for what the site looks like before drilling and after rehabilitation. It is recommended that the ECO be appointed full-time and based at the mine to ensure that any negative impacts are mitigated quickly. This will ensure that the site has been restored to its original state or to an acceptable level, and ensure the ERP is adequately applied in case of an emergency. Accordingly, training programmes and frequent emergency simulations are suggested to ensure that all personnel are aware of safety and emergency procedures.

A list of emergency contact numbers will be displayed at various locations around the site. If the emergency has the potential to affect surrounding communities, the communities will be alerted via alarm signals or contacted in person.

Personnel who do not comply with or ignore training and instruction regarding this, should be fined based on their offenses. First-time offenders may only get away with a written warning, depending on the seriousness of the offence. Second-time offenders may be suspended or fined, depending on the decision made by the site manager who may consult with the ECO, contractor and Safety, Health and Quality Officer of the mine.

52.3 Potential risk of acid mine drainage

If left open to the atmosphere, the open cast pits will generate acidic drainage/seepage. To avoid significant sulphide oxidation and subsequent AMD generation, mitigation measures are crucial (refer to Hydrogeological assessment conducted by Singo Consulting.

Post-mining water decant is predicted to occur once the final void has been rehabilitated and groundwater levels are allowed to return back to natural level. It is predicted that this decant could be acid-forming (normally Ca, Mg, Cl and SO_4 with mobilisation of metals at low pH). Should this be the case, long-term passive water treatment options will need to be investigated by Lazalelihlokohloko Mining and Projects to prevent untreated AMD decant water from entering the catchment.

52.4 Steps taken to investigate, assess and evaluate impact of acid mine drainage

Although not specifically assessed during this EIA or specialist assessments, AMD can be confirmed or disproved by performing geochemical sampling and analysis, as well as constructing a geochemical model by a qualified specialist. The Geohydrological Assessment conducted by Singo Consulting did not specifically model for geochemicals, but makes the following recommendations on acid-forming material and AMD:

- Separate acid-forming and non-acid forming material as characterised by geochemical sampling and analyses.
- Aim to remove as much of the coal seam (acid-generating material) as possible.
- Add lime to backfill material; it could be considered to minimise acid generation.

- Post-closure:
    - Rapid flooding should be done by diverting storm water channels and pumping available groundwater into the pit until the acid-producing material is inundated by the water.
    - After the acid-producing material is inundated by the water, the final back-filled open cast topography should be engineered to direct run-off is away from the open cast areas.
    - The final layer (just below the topsoil cover) should be as clayey as possible and compacted if feasible, to reduce recharge to the open casts.
    - Natural berms should be constructed to allow free drainage of surface water around the rehabilitated pit.

For RoM sites and PCDs, the following measures are applicable:

- AMD can be dealt with as follows:
    - Completely remove all remaining coal from the site
    - Use remaining material as backfill in open pits
    - Remove polluted soil, if any
    - Cover and cap these facilities to reduce water and oxygen reactions
    - If unsuccessful, consider neutralisation of acidic material
    - Alternatively, use passive leachate water management and treatment
- Polluted groundwater can be treated as follows:
    - Reduce hydraulic head by water shedding
    - Integrate capture-store-release systems
    - Utilise evapotranspiration
    - Cap and cover with capillary break
    - Use drainage diversions
    - Consider wetland filtration

52.5 Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage

A detailed Geochemistry study is required to assess and provide solutions should AMD be relevant for this project. Currently, the geohydrological assessment conducted by Singo is the only guideline which suggests mitigation measures for dealing with potential AMD.

52.6 Item 1(D)(VI): Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage

Engagement with surrounding mining houses should be undertaken to explore the potential for a regional management strategy for AMD.

52.7 Volumes and rate of water use required for the mining, trenching or bulk sampling operation

Water is required for use in the crushing and screening facility, on various stockpiles, as well as for potable use. It is therefore planned that water will be abstracted from existing and/or new boreholes, and/or supplied by the local municipality (at least for potable use). These water sources and volumes are still to be confirmed by undertaking the relevant feasibility studies (i.e. water balance) and confirmed in the IWUL application.

In total, there will be a PCD collecting the dirty water generated form the respective boxcut. The dirty water will be abstracted and re-used in the mining activities, to augment the plants' water deficit and for dust suppression. By augmenting the process water with dirty water run-off, the reliance on external, ground water resources can be significantly reduced. Dust suppression will be implemented on the stockpiles, loading platform, crushing area, overburden stockpiles and on internal roads.

52.8 Has a water use license been applied for

An application for an IWULA and associated Integrated Water and Waste Management Plan (IWWMP) as per the requirements of the NWA was submitted to the Department of Water Affairs (DWS). Lazalelihlokohloko Mining and Projects is committed to good practice in terms of water use and, as such, the water uses which requires authorisation are limited to:

1. Section 21 (a): Taking water from a watercourse.
2. Section 21 (c): Impending or diverting the flow of water in a water course.
3. Section 21(g): Disposing of waste in a manner that may detrimentally impact a water resource.
4. Section 21 (i): Altering the bed, banks, course or characteristics of a water course.
5. Section 21 (J): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.

In addition, regular surface water quality monitoring will be undertaken to ensure compliance by the appointed BEE consultants and maintenance of the catchment.

52.9 Imparts to be mitigated in their respective phases

The full impact assessment with associated mitigation and management measures are presented in Section 11.

53 FINANCIAL PROVISION

53.1 Determination of the amount of financial provision

Regulation 6 of the Financial Provision Regulations (GN R1147 in GG 39425 of 20 November 2015/2018) requires that an applicant for a mining right must determine the financial provision calculation based on the actual costs required for:

- Annual rehabilitation
- Final rehabilitation, decommissioning and closure
- The remediation of latent or residual environmental impacts, including but not limited to, the pumping and treatment of polluted or extraneous water

53.2 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under regulation 22 (2) (D) as described in 2.4 herein

Closure and rehabilitation is a continuous series of activities that begin with planning prior to the project's design and construction, and end with achievement of long-term site stability that creates a safe, physically stable rehabilitated landscape that limits long-term erosion potential and environmental degradation, and restores the land to pre-mining conditions as far as possible.

The following points outline the main objectives for rehabilitation and closure:

- Achieve a final land use that represents pre-mining conditions that is sustainable and meets legislative requirements and stakeholder needs.
- Create opportunities for alternative post-mining livelihoods by aligning to the regional planning.
- Ensure interconnectivity between the rehabilitated landscapes with surrounding regionally biologically diverse areas.
- Encourage, if and where required, the re-instatement of terrestrial and aquatic wetland biodiversity over time.
- Maintain and monitor all rehabilitated areas following re-vegetation and establishment of landscape features, like wetland pans. If this monitoring shows that the objectives have been met, make an application for closure.
- Prevent/minimise negative impacts and risks as identified in this report.
- Comply with local, district, provincial and national regulatory requirements.
- Follow a comprehensive consultation and communication process with all stakeholders.

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

The draft EIAr will be made available for public review; all comments will be captured in the final EIAr.

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

53.5 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives

The Rehabilitation Plan must compiled in support of the primary closure objectives. These objectives require the removal of the mining infrastructure and rehabilitation of the land to a suitable land use that represent pre-mining conditions and provide a safe and sustainable environment for surrounding receptors.

53.6 Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guidelines

The financial provision was calculated according to Regulation 6 of the Financial Provision Regulations (2015) which prescribe the minimum content requirements.

54 MONITORING COMPLIANCE AND PERFORMANCE ASSESSMENT

Lazalelihlokohloko Mining and Projects will be responsible for the implementation of all monitoring, mitigation and management measures, as well as compliance with the EMP. The recommended monitoring for the identified impacts is detailed below. The applicant will keep a record of all environmental monitoring taken on site. A summary of the environmental monitoring to be undertaken is included in the following section.

54.1 Monitoring of impact management actions

54.1.1 Soils, land use and land capability

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

- Visual soil assessment by a specialist
- Soil quality monitoring system
- Visual assessment should include specialist scoring of water ponding, plant vigour, yield, tilt, earthworms, runoff, ease of tillage, soil colour, soil aroma, soil structure and cloudiness
- Soil quality monitoring should include, bulk density, infiltration rate, water holding capacity, electrical conductivity, pH, soil nitrate and microbial activity

To ensure sustainability from an agricultural soil potential point of view, soil's grazing land capability should be restored. The land classified as low agricultural potential can be restored to grazing land capability. Grazing land can be reclaimed to a total soil depth of 300-600 mm.

Organic matter must be added back into the soil. The soil should be pre-mixed with organic material and placed back last to a depth of at least 300 mm. Continuous visual and soil quality monitoring should ensure that the best possible soil reclamation procedure is followed. Vehicle movements must be restricted on freshly dumped soil to prevent compaction as far as possible.

54.1.2 Surface water

For efficient management of water on-site, a good understanding of the site water balance is required. To achieve this, the following monitoring is needed:

- Rainfall: To be measured daily on-site
- Flows: To be measured weekly. Flows include the following:
    - Mine water pumped from the opencast workings
    - Inflows to the PCDs
    - Water pumped from the PCDs for reuse in the operations
    - Potable water use

54.1.3 Wetlands

Monitoring of the wetlands and mining activities is important to detect any predicted or unforeseen impacts on these sensitive systems. Understanding such impacts will allow for the application of appropriate remedial action. Wetland health assessments should be conducted annually for all wetlands on the mine property. The primary objective of these assessments should be to ensure that no modifications to the hydrological, geomorphological and vegetation characteristics of the wetlands have occurred during the construction and operational phases.

Should wetland rehabilitation be required post-mining, the rehabilitation efforts would have to be monitored to ensure the wetlands ecosystems function and biodiversity is restored. These efforts must also be monitored to ensure that no alien invasive plant species spread or establish, soil compaction and erosion is minimised and sedimentation build-up is prevented or minimised.

54.1.4 Groundwater

54.1.4.1 Groundwater monitoring system

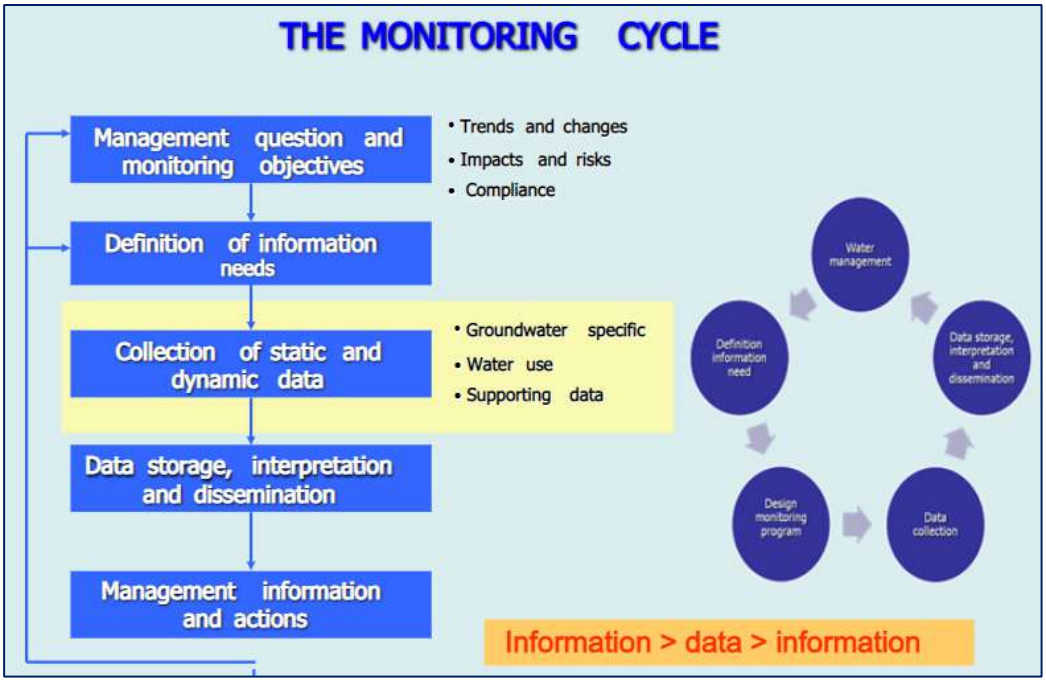


Figure 76: Groundwater monitoring cycle (IWSD, 2011)

54.1.5 System response monitoring network

54.1.5.1 Water level

Groundwater levels must be recorded on a quarterly basis using an electrical contact tape or pressure transducer, to detect any changes or trends in groundwater flow direction.

54.1.5.2 Sampling method and preservation

- One-litre plastic bottles with a plastic cap (no liner in the cap) are required for most sampling exercises. Glass bottles are required for testing of organic constituents. Sample bottles should be marked clearly with the borehole name, date of sampling, water level depth and sampler's name.
- Water levels (mbgl) should be measured prior to sampling, using a dip meter. Each borehole to be sampled should be purged (to ensure sampling of the aquifer and not stagnant water in the casing) using a submersible pump or, in the event of a small-diameter borehole, a clean disposable polyethylene bailer. At least three borehole volumes of water should be removed through purging or continuous water quality monitoring, until the electrical conductivity value stabilises. Metal samples must be filtered in the field to remove clay suspensions.
- Samples should be kept cool in a cooler box in the field and prior to submission to the laboratory.
- The pH and EC meter used for field measurements should be calibrated daily using standard solutions obtained from the instrument supplier.

54.1.5.3 Sampling locations

The main objectives in positioning the monitoring boreholes are:

- Monitoring of groundwater migrating away from the pit area.
- Monitoring the lowering of the water table and the radius of influence.

54.1.5.4 Data management

In any project, good hydrogeological decisions are made based on good information developed from raw data. The production of good, relevant and timely information is key to developing qualified long-term and short-term plans. For the minimisation of groundwater contamination, it is necessary to use all relevant groundwater data. An Excel database was used during the course of this investigation. It is recommended that Lazalelihlokohloko Mining and Projects use this database and continuously update and manage it as new data becomes available. Monitoring results will be captured in an electronic database as soon as results become available. This database will include:

- Data presentation in tabular format
- Time-series graphs with comparison abilities
- Graphical presentation of statistics
- Presentation of data, statistics and performance on diagrams and maps
- Comparison and compliance to legal and best practice water quality standards

54.1.5.5 Reporting

Based on the recorded water quality data, the data management functions will be carried out and reported to mine management on a monthly basis. The contents of the report should include the monthly water monitoring results and trends at surface points, as well as comments on the effectiveness of the mitigation measures and monitoring programme. Reporting to the authorities will take place as specified in the permitting/licensing conditions. Any accidental release of pollutants or possible polluting substances should be reported to the relevant authorities, as specified in the permitting conditions.

54.3.3 Monitoring frequency

Groundwater is a slow-moving medium and drastic changes in the groundwater composition are not normally encountered within days. Groundwater monitoring should be conducted quarterly. Samples should be collected by an independent groundwater consultant, using best practice guidelines, before being analysed by a SANAS-accredited laboratory. Groundwater levels must be recorded on a quarterly basis (with accuracy of within 0.1 m) using an electrical contact tape, float mechanism or pressure transducer, to detect any changes or trends in groundwater levels.

54.1.5.6 Monitoring parameters

Table 52: Groundwater monitoring

Class	Parameter	Frequency	Motivation
Physical	Static groundwater levels	Monthly	Time-dependent data is required for transient calibration of numerical flow models. Changes in static water levels may give early warning of dewatering in the area.
	Rainfall	Daily	Recharge to the saturated zone is an important parameter in assessing groundwater vulnerability. Time-dependent data is required for transient calibration of numerical flow models.
	Groundwater abstraction rates (if present)	Monthly	Response of groundwater levels to abstraction rates can be used to calculate aquifer storativity – important for groundwater management.
Chemical	Major chemical parameters: Ca, Mg, Na, K, NO_3, SO_4, Cl, Fe, Alkalinity, pH, EC Total Petroleum Hydrocarbons (TPH)	Quarterly	Background information is crucial to assess impacts during and after operation. Changes in chemical composition may indicate areas of groundwater contamination and be used as an early warning system to implement management/remedial actions. Legal requirement. Groundwater chemistry forms an integral part of the development of conceptual models.
	Minor chemical constituents Full scan of trace metals	Quarterly	Changes in chemical composition may indicate areas of groundwater contamination and be used as an early warning system to implement management/remedial actions. Legal requirement.
	Other Stable isotopes	Ad hoc basis	The monitoring programme should allow for research and refinement of the conceptual geohydrological model. This may, at times, require special analyses, like stable isotopes

54.1.5.7 Monitoring borehole locations

Monitoring boreholes should be located around the mining pit, on upper levels and near the river to monitor flow direction, rate of water flow and water quality.

54.2 Invasive alien plants

Declared weeds and invaders have the tendency to dominate or replace the herbaceous layer of natural ecosystems, transforming the structure, composition and function of natural ecosystems. Therefore, it is important that all these transformers be eradicated and controlled by means of an eradication and monitoring programme. Some invader plants may degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

According to the published Alien and Invasive Species regulations in terms of Section 97(1) of the NEM:BA, there are four categories of problem plants, namely:

- Category 1a: These plants are high-priority emerging species requiring compulsory control. All breeding, growing, moving and selling are banned.
- Category 1b: These plants are widespread invasive species controlled by a management programme.
- Category 2: These plants are invasive species controlled by area. Can be grown under permit conditions in demarcated areas. No breeding, growing, moving and selling without a permit.
- Category 3: These plants are ornamental and permitted on a property but may not be planted or sold.

Other aspects identified regarding flora and fauna that require monitoring:

- Impacts on faunal populations and numbers
- Wetlands and river plant species abundance and diversity
- General vegetation structure and health

This should be completed by a qualified botanist and zoologist. The monitoring should be undertaken at least every six months (winter and summer month monitoring) staring in the construction phase and lasting for the duration of the operational phase and five years after closure and rehabilitation.

55 NOISE

A noise specialist assessment was not conducted for this project.

Generally, it is recommended that a noise monitoring programme is developed after the mine selects the final plant location. The noise monitoring programme should be able to define existing long-term sound levels before the construction phase starts. This will allow the identification of a potential noise impact if a noise complaint is registered.

Environmental noise monitoring can be divided into two distinct categories, namely:

- Passive monitoring: The registering of any complaints (reasonable and valid) regarding noise.
- Active monitoring: The measurement of noise levels at identified locations.

Active environmental noise monitoring is recommended due to the medium significance for a noise impact to develop. In addition, should a valid complaint be registered, the mine must investigate it. It is recommended that the noise investigation is done by an independent acoustic consultant.

While a noise monitoring programme is recommended, site-specific conditions may require that the monitoring locations, frequency or procedures be adapted.

56 AIR QUALITY

It must be noted that an air quality specialist assessment was not conducted for this project.

General recommendations:

- Ambient air quality monitoring must be established to get a baseline condition prior to the onset of the operations and to establish the level at which the proposed operations impact ambient air quality.
- Fallout monitoring should be continued for the LoM to better assess the level of nuisance dust associated with mining and process-related operations. Fallout sampling should be undertaken in the neighbouring areas and on-site.
- PM10 and PM2.5 dust monitoring must be undertaken at the aforementioned sites, but also in and around potential fugitive emission sources to determine mitigation measures and focus management efforts.
- Further mitigation measures that should be applied, if it is found that dust and PM10 levels are found to exceed the limits, are:
    - Reducing the speed of the haul trucks on the pit haul road and the access haul road.
    - Fully sealing the pit haul road and access haul road to achieve 100% mitigation.

It is highly recommended that a dust monitoring campaign be conducted prior to the commencement of the proposed mining operations. This campaign should continue for the LoM to establish a historical repository of data needed to fully understand/address fugitive and airborne dust emissions from the construction, operation and closure activities. Managing dust fallout effectively will result in the reduction of respiratory diseases (that are caused by air pollution), reduction in risk of damage to property, improved visibility and fewer disturbances to existing flora and fauna habitats.

The gravimetrical dust fallout method is recommended. Site layout for sampling points must be carried out according to the eight main compass directions. Site layout and equipment placement must be done in accordance with the ASTM standard, D 1739 – 2010, thereafter relevant sampling reference numbers will be allocated to the receptors. At each gravimetric dust fallout gauge/receptor point, there is a stand built according to specification, containing the dust sample collection bucket. Samples will be collected after a one-month running period (about 30 days' exposure). After sample collection, the samples are taken to a SANAS-accredited laboratory, as required. A visual site investigation is done whereafter correlations are drawn and findings are identified and reported on.

Dust buckets of a standard size and shape are prepared and set up at locations related to the eight main compass points on the borders of the property so that dust can settle in them for periods of 30+/-2 days. The dust buckets are then sealed, replaced with empty ones and sent to the SANAS-accredited laboratory for analysis. The masses of the water-soluble and insoluble components of the material collected are then determined and results are reported as $mg/m^2/day$. This methodology is described according to South African National Standards 1929:2004 and the American Society for Testing and Materials (ASTM) Designation: D 1739-98 (2010). The results for this method of testing are obtained by gravimetrical weighing. The apparatus required include open-top buckets/containers not less than 150 mm in diameter with a height of not less than twice its diameter. The buckets must be placed on a stand at a height of 2+/-0.2 m above the ground.

57 VISUAL

A visual specialist assessment was not conducted for this project. General primary measures that will be implemented will minimise the visual impact by softening structure visibility by “blending” with the surrounding areas. Such measures will include rehabilitation of the mining area by re-vegetation of the mining site and surrounding area.

Secondary measures will include final rehabilitation, after care and vegetation maintenance to ensure that the final landform is maintained. The following are generally recommended:

- Plant some indigenous trees to create a barrier between the neighbours and roads.
- Manage dust from stockpile areas, roads and other activities by means of dust suppression.
- Install a wind barrier system that encloses the stockpiles.
- Rehabilitate the area once mining is completed.

Grievances from visual receptors must be recorded, monitored and addressed through a grievance mechanism throughout the project, including the construction, operation and rehabilitation phases. Continuous consultation with stakeholders is vital. It is also suggested that photographic records be maintained with findings (and GPS location of photographs), follow-up actions and close-out records as part of the Environmental Management System.

58 BLASTING AND VIBRATION

Ground vibration and air blast will impact people. This includes various impacts on structures, even at low levels. People may experience ground vibration at very low levels, which are well below damage capability for most structures.

The first level of good practice is to avoid unnecessary problems. One problem that can be reduced is the public's reaction to blasting. Concern for a person's home could be reduced by a scheme of precautionary, compensatory and other measures that offer guaranteed remedies without undue argument or excuse. In general, it is also in an operator's financial interests not to blast where there is a viable alternative. Where blasting can be avoided, perhaps through new technology, it must be carefully considered in the light of environmental pressures. Historical precedent may not be a helpful guide in such cases.

Independent structural surveys are one way of building a good relationship with neighbours. Since changes that occur in crack patterns may be misunderstood, surveys may not be an effective solution in this case. Cracks open and close with seasonal changes of temperature, humidity and drainage, and numbers increase as buildings age. Additional actions need to be taken to supplement such surveys. Ground vibration, overpressure and fly rock control measures may be of better use in this case.

Many of the fly rock control measures aid cost-effective production. These measures include:

- Correct blast design, which is essential and should include a survey of the face profile prior to design, ensuring appropriate burden to avoid over-confinement of charges which may increase vibration by a factor of two.
- The setting-out and drilling of blasts should be as accurate as possible and the drilled holes should be surveyed for deviation along their lengths and, if necessary, the blast design must be adjusted.
- Correct charging; if free poured bulk explosives are used, its rise during loading should be checked. This is especially important in fragmented ground to avoid accidental overcharging.
- Correct stemming will help control air blast and fly rock and will aid in the control of ground vibration. Controlling the length of the stemming column is important; too short and premature ejection occurs, too long and there can be excessive confinement and poor fragmentation. The length of the stemming column depends on the hole diameter and the type of material used.
- Monitoring of blasting and re-optimising of the blasting design in the light of results obtained, changing conditions and experience should be carried out as standard.

A house could develop up to fifteen cracks a year and may subsequently be devaluated. Ground vibration can cause cracks in structures if it is strong enough and occurs at continued high levels. Environmental forces like temperature, water and wind contribute to cracks developing in structures. Visual proof of actual damage due to blasting operations are limited.

59 HERITAGE AND PALAEONTOLOGY

From a heritage perspective, supported by the findings of this study, the proposed mining development and associated developments are feasible. However, the proposed mining development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed sites.

The recorded burial site must be demarcated by a danger warning sign and clearly marked to avoid any accidental damage by heavy mining equipment and haulage trucks. The applicant must ensure that the descendants of the recorded graves are sought and notified that the proposed mining development has an impact (directly or indirectly) on their burial site. No stone robbing or removal of any material is allowed. Any disturbance or alteration to this burial site would be illegal and punishable by law, under Section 36(3) of the NHRA. Contractors and workers will be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51. (1).

Any measures to cover up the suspected archaeological material or collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement of the SAHRA. The footprint impact of the proposed mining development and associated infrastructure must be kept to a minimum to limit the possibility of encountering chance finds.

Should any unmarked burials be exposed during mining, affected families must be tracked and consulted and relevant rescue/relocation permits must be obtained from SAHRA before any grave relocation can take place. A professional archaeologist must be retained to oversee the relocation process in accordance with the NHRA. Should chance archaeological materials or human burial remains be exposed during mining work on any section of the proposed mining development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimise disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA.

The project PPP must ensure that any cultural heritage related matters for this project are given due attention when they arise and are communicated to PHRA throughout the proposed project development. This form of extended community involvement would pre-empt any potential disruptions that may arise from previously unknown cultural heritage matters that may have escaped the attention of this study. The landowner must be requested to declare burial sites on their farmsteads to the EAP.

Subject to the recommendations made herein and the implementation of the mitigation measures and adoption of the project EMP, there are no other significant cultural heritage resources barriers to the proposed mining right application. The heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations made.

60 SOCIAL

It is proposed that a monitoring programme be developed and implemented to monitor the implementation of social management actions. It is recommended that this be conducted by a competent Monitoring and Evaluation (M&E) officer as the implementation of monitoring tools (surveys, databases, etc.) will require specialised skills.

60.1 Monitoring and reporting frequency

Table 53 discusses the monitoring and reporting frequency.

60.2 Responsible persons

The roles and responsibilities associated with the monitoring programme are set out in **Table 53**.

60.3 Time period for implementing impact management actions

Table 53 captures the time period for implementing impact management actions.

60.4 Mechanism for monitoring compliance

Table 53 sets out the mechanism for monitoring compliance with the identified impact management actions.

Table 53: Monitoring and management of environmental impacts

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
Surface water	Water quality	Ensure that monitoring is implemented to cover all mining activity areas. Water quality parameters that need to be analysed are shown in the Surface Water Report.	Specialist Environmental Quality	• Monthly during construction. • Reduce to quarterly on rehabilitated areas. • Monitoring needs to carry on after the project has ceased and the results depict a steady state, as it is standard practice to detect residual impacts.
	Water quantity	• Flow monitoring should be carried out in channels and pipelines and at on-site facilities. • Monitoring water levels in dams and channels. • Records of pit dewatering.	Specialist Environmental Quality	• Instantaneous where automatic flow meters are in place for real-time measurements. • Where there are no automatic flow meters, weekly monitoring needs to be done. • In operational areas, daily records must be kept.
	Physical structures and SWMP	• Dams are inspected for silting and blockages of inflows, pipelines for hydraulic integrity; monitor the overall SWMP performance. • Personnel should walk around facilities to determine the facilities' condition and identify any anomalies like leaks or overflows and system malfunctions.	Specialist Environmental Quality	Continuous process and yearly formal report.
	Meteorological data	Measure rainfall	Appointed mine ECO to do spot checks	• Real-time system if in place. • Alternatively, install a rain gauge and measure storm depths after rainfall events.
Soil	Fertility	Monitoring should always be carried out at the same time of the year. Soils should be	Soil scientist	Annually, at the same time of year.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
		sampled and analysed for the following parameters: pH (KCl); Phosphorus (Bray 1); Cations: Calcium, Magnesium, Potassium, Sodium, Zin (mg/kg); Cation exchange capacity (CEC); soil organic carbon (%); and Soil texture (clay, silt and sand).		
	Erosion	Erosion occurrences	Soil scientist	Annually, at the same time of year.
	Stripped and stockpiled soil	• The location of soil types that can be stripped and stockpiled together. • Stripping depths of different soil types. • Location, dimensions and volumes of planned stockpiles for different soil types.	Soil scientist	Annually, at the same time of year.
Aquatic ecology	Overall PES	Standard River Ecosystem Monitoring Programme (Ecostatus) methods.	Aquatic specialist	Bi-annually (dry and wet season).
	Determine if water quality deterioration is occurring	SASS5 scores should not decrease and be related to mining activities.	Aquatic specialist	Bi-annually.
	Determine if water quality deterioration is occurring	Standard water quality monitoring, as per the surface water specialist report.	Aquatic specialist	Monthly.
	Determine if water/ habitat quality deterioration is occurring	Monitor for presence of fish.	Aquatic specialist	Bi-annually.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
Fauna and flora monitoring	• Impacts on vegetation structure and health. • Impacts on faunal populations and numbers. • Red data listed fauna and flora species (should it be recorded going forward).	Ensuring sustainable populations of fauna and flora persist until closure.	Terrestrial ecologist	Biannually (dry and winter seasons).
Vegetation rehabilitation	Success of rehabilitation	Rehabilitation success	Rehabilitation specialist and/or botanist	Quarterly (one year after rehabilitation), then biannually for the next two years.
Soil disturbance	Establishment of alien plant species	Alien plant monitoring	Qualified botanist	Yearly monitoring for LoM, including three years post-mining.
Construction and operational phase noise	Noise disturbance	Monitoring should be undertaken in accordance with the National Noise Control Regulations in conjunction with the SANS 10103:2008 guidelines.	Noise monitoring should be conducted by an independent specialist	The client's Environmental Coordinator must implement and manage the recommended monitoring programme, and an independent specialist must carry out the monitoring programme.
Groundwater	Groundwater levels	Dip meter should be used to detect any changes or trends in groundwater elevation and flow direction.	Geohydrologist	Annually: Change to quarterly if affected and needs to be monitored for changes.
	Groundwater quality	Analyses of the following constituents are recommended: Macro analysis i.e. Ca, Mg, Na, K, SO4, NO3, F, Cl; Initial full suite metals and then Al, As, Ba, Cu, Se, Pb, Fe, and other	Geohydrologist	Quarterly: Samples should be collected using best practice guidelines and be analysed by a SANAS-credited laboratory.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
		metals identified according to results of the initial analyses; pH and Alkalinity; and TDS and EC .		
Wetlands	General - All impacts and threats to wetlands predicted or not	• Activity monitoring through all phases is important to ensure all impacts are remediated as soon as possible to prevent long-term residual impacts to the system that compromises the wetland's ability to function. • The valley bottom wetlands of high sensitivity should be monitored regularly to determine if mining activities have any residual or unforeseen impact on the functioning of these systems. The functional aspects of the wetland should be assessed, including floral diversity, water quality, use of wetland by faunal species, erosion and more.	The environmental officer of the mine should monitor the wetlands at all times as part of managing the site and the surrounding area. An independent wetland specialist should carry out monitoring on a regular basis during all phases of the mining project and provide recommended remedial actions where required.	Internal monitoring should be done as often as possible according to mine management practices. External independent wetland specialist monitoring should be done regularly and when needed, i.e. after an incident.
Wetlands and their buffer areas	Removal of wetland soils and vegetation. Loss of wetland habitat.	• Monitor all risks, including uncontrolled erosion, hydrocarbon spills, etc. and remediate • Ensure proper handling and storage of wetland soils. • Ensure that all activities are conducted according to the detailed design and are implemented with the least possible impacts on the wetlands	Wetland specialist	Construction activities should be monitored monthly.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
Open pit mining requiring dewatering	Perforation of rock and groundwater reserves leading to severe hydrological and geomorphological impacts to wetlands and catchment due to draw down cone.	As mining progresses, wetlands should be monitored for evidence of loss of functionality due to groundwater changes.	Geohydrologist and wetland specialist	Internal monitoring should be done as often as possible during operation, according to mine management practices . External independent wetland specialist monitoring should be done annually and when needed, i.e. after an incident.
Decommissioning activities in and around remaining wetland habitats, like demolition and removal of all infrastructure, and subsequent final rehabilitation of the final void and area	The decommissioning and rehabilitation activities occurring in an ecologically-sensitive catchment pose significant potential negative impacts to functioning wetlands and catchment. The rehabilitated area could cause major negative impacts due to spread of alien invasive vegetation, increased soil compaction erosion and subsequent sedimentation on the wetland ecosystems	• Monitor for all risks, including uncontrolled erosion, hydrocarbon spills, etc. and remediate. • Ensure proper handling and storage of wetland soils. • Ensure that all activities are conducted according to the detailed design and are implemented with the least possible impacts to the wetlands.	Wetland specialist	Rehabilitation activities should be monitored monthly once rehabilitation commences.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
Employment creation	Employment created during construction and operation	Local Employment Policy is developed and assigns preferential status to local, female and youth employment, as well as associated targets.	HR Department	Once-off for construction and operational phase respectively.
		Applicable requirements of the existing Recruitment and Selection Policy are applied when employing locally.	HR Department	Every six months.
		Local employment requirements are included in contractor management plans.	Procurement and Supply Chain Management Department	Monthly or as required.
		Engagement with relevant groups to ensure that all understand the project's employment requirements in terms of skills, type of employment.	• HR Department • Social Manager	Prior to construction, thereafter every six month.
		Compilation and implementation of Structured Stakeholder Engagement Plan and Grievance mechanism.	• Social Consultant • Social Manager	Prior to construction and should continue to implement the Grievance mechanism and report back to stakeholders on a quarterly basis. Grievances should be address in a month.
		Targets in terms of local recruitment are met by project and contractors.	HR Department	Monthly
		All locally-recruited employees are recruited by means of the database.	HR Department	Annually
		Percentage of locally-recruited employees increases on an annual basis.	HR Department	Annually

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
		Labour pool database is developed and kept up-to-date.	Procurement and Supply Chain Management Department	Every six months.
Economic development	Multiplier effects on the local economy and diversification and growth of the economy	Project design parameter has avoided/ minimised displacement.	Senior management	Pre-construction.
		A transparent negotiation process has been implemented.	• Land acquisition/access Manager • Public relations manager	Pre-construction.
		Compensation and resettlement implemented.	Land acquisition/access Manager	Every three months.
		Develop company policy to manage various displacement impacts.	• Consultant • Social Manager	Once-off.
		Improved quality of life of those affected by displacement impacts.	• Consultant • Social manager	Two years after displacement.
Influx-related impacts	Influx of people may have an impact on the socio-economic environment	Develop influx management plan.	• SHEQ Manager • Social Manager • Senior Management	Pre-construction and pre-operation.
		Investigate partnerships with local authorities.	• Social Manager • Public Relations Manager Legal Department	Once-off during construction, thereafter annually.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
		Sign agreements with local authorities on assistance with IDPs and SDFs.	Senior Management	Once-off.
Impacts on community health and safety (socio-economic)	Community health and safety may be impacted by mine construction and operation	Technical Consultant is appointed to develop a Community Health Safety and Security Plan (CHSSP), which should include an awareness campaign.	• Procurement and Supply Chain Management Department • Social Manager	Once-off at start of construction, and with a detailed revision when operation commences.
		CHSSP is adopted and implemented	• Senior Management • SHEQ Manager • Social Manager	Adopted once-off at start of construction, and with a detailed revision when operation commences. Implemented every four months
		Policing forum is established.	• Social Manager	Once-off at start of operation
		HIV/AIDS policy is expanded to include HIV awareness campaigns in communities and provision of Voluntary Counselling and Testing (VCT) for communities.	• SHEQ Department • Senior management	Once-off
		Service providers appointed to implement HIV awareness campaigns in communities and provide VCT for communities.	• Procurement and Supply Chain Management Department • Social Manager	Once-off
		HIV awareness in communities is improved, and VCT services are accessed.	• Service Provider • Social Manager	Annually
		HIV awareness campaigns in communities and provision of VCT for communities are implemented.	• Service Provider • Social Manager	Annually

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
Community development and social upliftment (socio-economic)	Community development and social upliftment	Detailed skills inventory is prepared for the Project.	• SLP Manager • HR Department • Senior Management inputs	Once-off, reviewed every three years
		Appoint qualified Technical Consultant for Skills Survey.	• Department Procurement and Supply Chain Management • Social Manager	Once-off prior to construction and appointment of operational work force.
		Qualified Training Consultant is appointed to develop training programmes.	• HR Department • Procurement Supply Chain • Management	Once-off prior to construction.
		Training programme is developed based on the skills gaps identified for the Project.	• Consultant • HR Department • Social Manager	Once-off prior to construction, updated every five years.
		Training programme is implemented.	HR Department	Annually.
		Staff skills levels and job performance improve	HR Department, with input from line managers	Annually.
		Locally recruited construction workforce who received skill training is employed during the operational phase	HR Department	Once off at start of construction.
		Skills levels in local communities improve.	HR Department with input from line managers	Every two years.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
		AET programmes are implemented for both workers and people from local communities.	• SLP Manager • Training Service Provider • Social Manager	Annually.
Mine rehabilitation and closure	Dependency on the Project for sustaining local economy (Social Closure)	Plan on file	Social Manager with inputs from senior management	Five years before closure.
		Closure plan implementation report.	Social Manager with inputs from senior management	After closure.

61 INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT REPORT

A monthly site visit and report needs to be written by the ECO to inspect all aspects of the EMPr, as required. A performance assessment will be undertaken on an annual basis, after which a Performance Assessment Report will be submitted to the DMRE and other relevant governmental departments.

62 ENVIRONMENTAL AWARENESS PLAN

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

The purpose of an EAP is to outline the methodology that will be used to inform the mine's employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with to avoid contamination or degradation of the environment. The EAP primarily introduces and describes the requirements of the range of environmental and social plans for the proposed project during the life of the project.

The EAP ensures that training needs are identified and appropriate training is provided and should communicate the:

- Importance of conformance with the environmental policy, procedures and other requirements of good environmental management.
- Significant environmental impacts and risks of an individual's work activities and the environmental benefits of improved performance.
- Individual's roles and responsibilities in achieving the aims and objectives of the environmental policy.
- Potential consequences of not complying with environmental procedures.

The objective of this EAP is to inform employees and contractors of:

- Any environmental risks which may result from their work.
- The manner in which the possible risks must be dealt with to prevent degradation of the environment.

In general, the purpose of implementing an EAP is to increase awareness of those partaking in the mining and related activities which have the potential to impact negatively the environment. This will aid in promoting the global goal of sustainable development.

Training and induction of employees, supervisors, sub-contractors, contractors and visitors will ensure co-operation in terms of environmental management. This will contribute to the successful implementation of the conditions set out in the EMPr and Environmental Authorisation, and thus to the environmental sustainability of the project. In addition, it will ensure the success of the proposed project regarding compliance with legislation, and avoid possible future liabilities and legal action due to a lack of environmental awareness.

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

The effectiveness and efficiency of this plan will be monitored through annual audits aimed at testing the environmental awareness of employees directly and the analysis of the root causes of environmental incidents, including non-conformance to legal requirements, to determine which incidents were caused by a lack of environmental awareness and training. The evaluation of the EAP will be conducted by the SHEQ Department. This evaluation will entail the auditing of the operation during the construction and operation phase once it has commenced.

Management will establish and maintain procedures for internal communication between various levels and functions of the organisation, and receiving, documenting and responding to relevant communication from external I&APs. The organisation will consider processes for external communication on its significant environmental aspects and record its decision. Communication is a management responsibility. All line supervisors are responsible for effective communication in their own sections. Environmental risks will be dealt with through training and communication to ensure minimal environmental degradation.

The EAP should be sufficient to make all those involved with the project aware of risks that may occur, as well as the necessary mitigation required to minimise these risks. Lazalelihlokohloko Mining and Projects and its contractors should take the EAP seriously to show that they are sensitive to the environment's well–being, empowerment of the local people and returning the land to appropriate use once the reclamation activities have been completed.

Non-compliance should be dealt with by the SHEQ and site manager on a case-by-case basis. Secondary or serious offenders should be dealt with immediately, and where necessary, disciplinary hearings and suspension should be considered.

63 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

All information committed to in the SR and as requested by the DMRE to date, has been incorporated into the EIA/EMPr. The financial provision for the environmental rehabilitation and closure requirements of mining operations is governed by NEMA, as amended, which indicates in Section 24P that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The financial provision will be reviewed annually, as required by the DMRE.

64 UNDERTAKING

The EAP herewith confirms:

2(a) the correctness of the information provided in the reports

2(b) the inclusion of comments and inputs from stakeholders and I&APs

2(c) the inclusion of inputs and recommendations from the specialist reports where relevant

2(d) the acceptability of the project in relation to the findings of the assessment and level of mitigation proposed.

64.1 Regarding correctness of information

I, Rudzani Shonisani, herewith confirm that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties have been correctly recorded in the report.

Signature of the EAP

Date

64.2 Regarding level of agreement

I, Kenneth Singo, herewith confirm that the information provided in the foregoing report is correct, and that the level or agreement with Interested and Affected Parties and stakeholders have been correctly recorded and reported herein.

Signature of the EAP

Date

Appendix 1: Competent Authority Letters

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DMR 10

Private Bag X 7279, Witbank, 1035, Saveways Centre, First Floor, Mandela Drive, Witbank,1035 Tel (013) 6530500, Fax (013) 6903288
Reference: MP 30/5/1/12/2/ 10230 MR Enquiries: Ms. Nontobeko Mdakane Email address:

REGISTERED MAIL

THE MEMBER/S

LEZALELIHLOKOHLOKO MINING AND PROJECTS CC

PRIVATE BAG X 7297

SUITE 87

WITBANK

1035

Sir/Madam

APPLICATION FOR A MINING RIGHT IN TERMS OF SECTION 22 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) AS AMENDED BY SECTION 18 OF ACT 49 OF 2008: BY LAZELELIHLOKOHLOKO MINING AND PROJECTS TO MINE COAL ON THE REMAINDER AND PORTION 1 OF THE FARM KLIPSPRUIT 136 HT, SITUATED IN THE MAGISTERIAL DISTRICT OF PIET RETIEF.

1. I refer to the abovementioned matter and confirm that your application for a mining right in terms of section 22 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) as amended by S18 of the Amendment Act 2008 (Act 49 of 2008) has been accepted.

2. In terms of section 18 (4) (a) and (b) as amended, you are required to submit::

   2.1. The required environmental reports and documents as stipulated at your acknowledgement of receipt of an environmental authorisation in this regard.

3. to notify and in writing consult with the land owner(s) or lawful occupier(s) and all interested and affected parties (I & AP) and upload the results of such consultation **within 180 days from the date of this letter.**

4. Should the land be owned by the communities of a Trust on behalf of the community, a proper and thorough consultation process must be engaged upon and a legitimate Tribal Resolution or consent must be obtained from the Traditional Authority / Council or Trust and be submitted with the results of consultation.

5. **Kindly be advised that your application is accepted on Portion 1 of the farm Klipspruit 136 HT only. Your application is rejected on Remainder and Portion 1 of the Farm Klipspruit 136 HT, Remainder, Portion 1 & 2 of the Farm Klipspruit 138 HT, Remainder, Portion 1, 2, 3 & 4 of the Farm Klipspruit 137 HT, Remainder Portion 1, 2, 6, 10, 11 13, 14, 15, 16, 18 23, 29, 30 & 33 of the Farm Mooihoek 168 HT, since there are either accepted or issued mining permits or rights on the same area and for the same mineral.**

6. You are advised to submit a revised Regulation 2.2 plan **(on or before 15th May 2019)** excluding the areas your application has been rejected on. Secondly, some farm portions cannot be established and some do not form part of the area depicted by both the Reg 2.2 and the selected farms on SAMRAD and these are portion 3, 26, 27, & 29 of farm Mooihoek 168 HT and portion 4 of the farm Klipstruit 138 HT does not exist and RE, 1, 2, 3, & 4 of the farm Klipstruit 137 HT is omitted from the property description even though it forms part of the application area as per Reg 2.2.

7. In order to comply with section 2(d) read together with 23 (1) you are required to submit the following documents **within 30 days** from date of this letter

a. Member's certificate relating to the sole member in the close corporation

8. You are advised to apply for water use license from the Department of Water and Sanitation

Do not hesitate to contact us, should you need clarity.

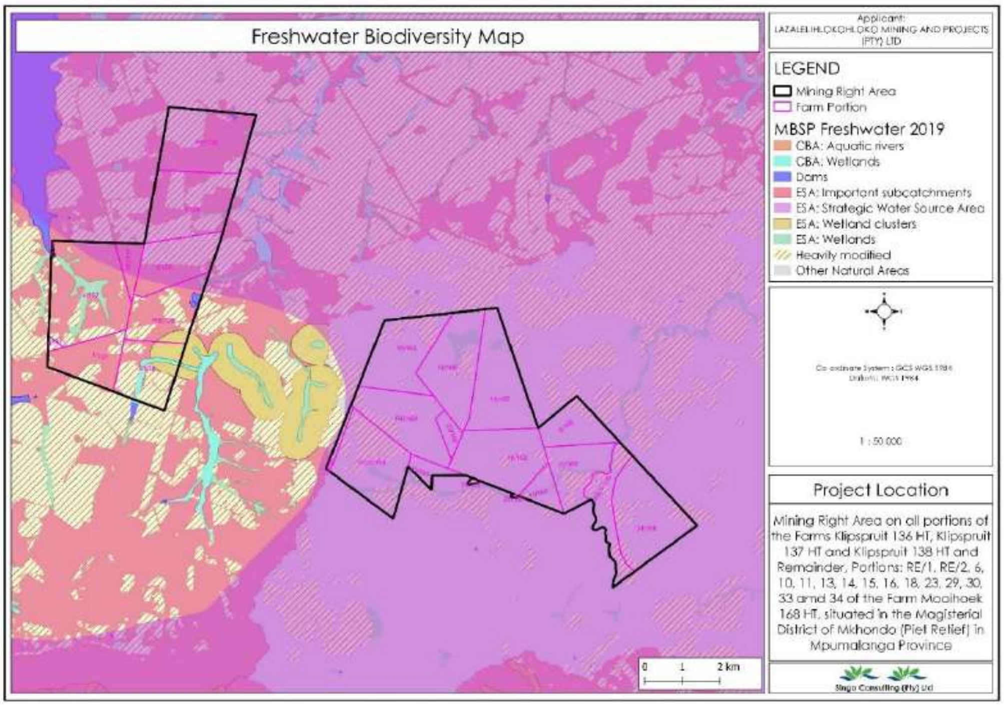
Yours faithfully

ACTING REGIONAL MANAGER
MPUMALANGA REGION
DATE: 6/5/2019

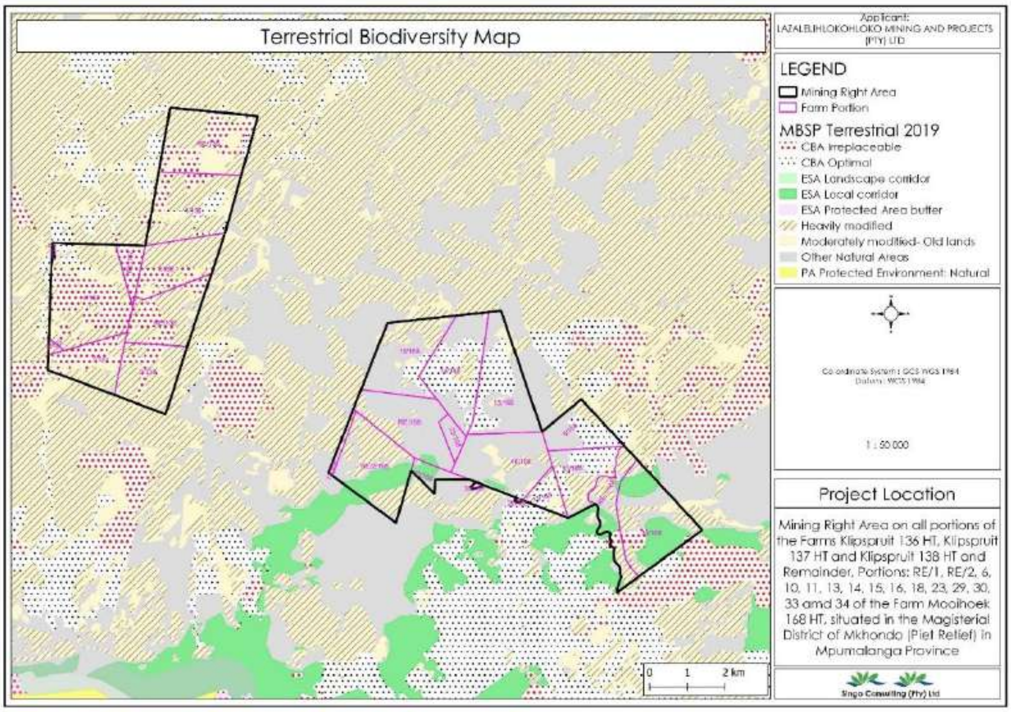
Appendix 2: EAP CV

Due to POPI Act sensitive information will not be disclosed to the public.

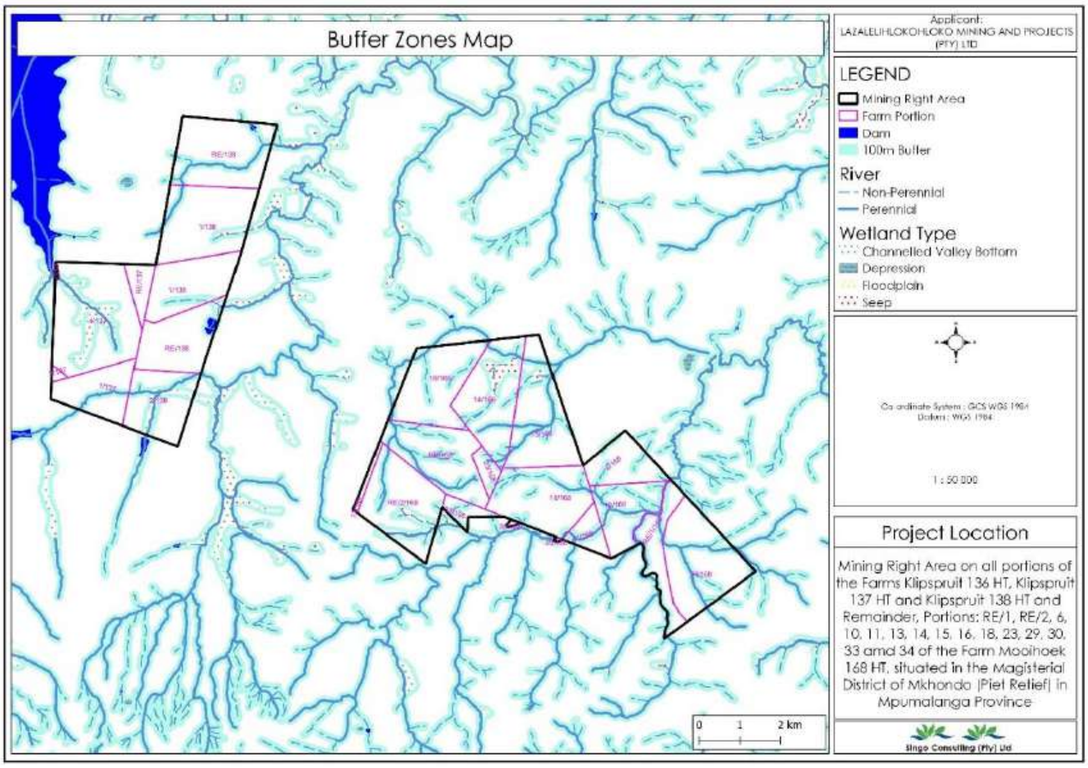
Appendix 3: Project maps



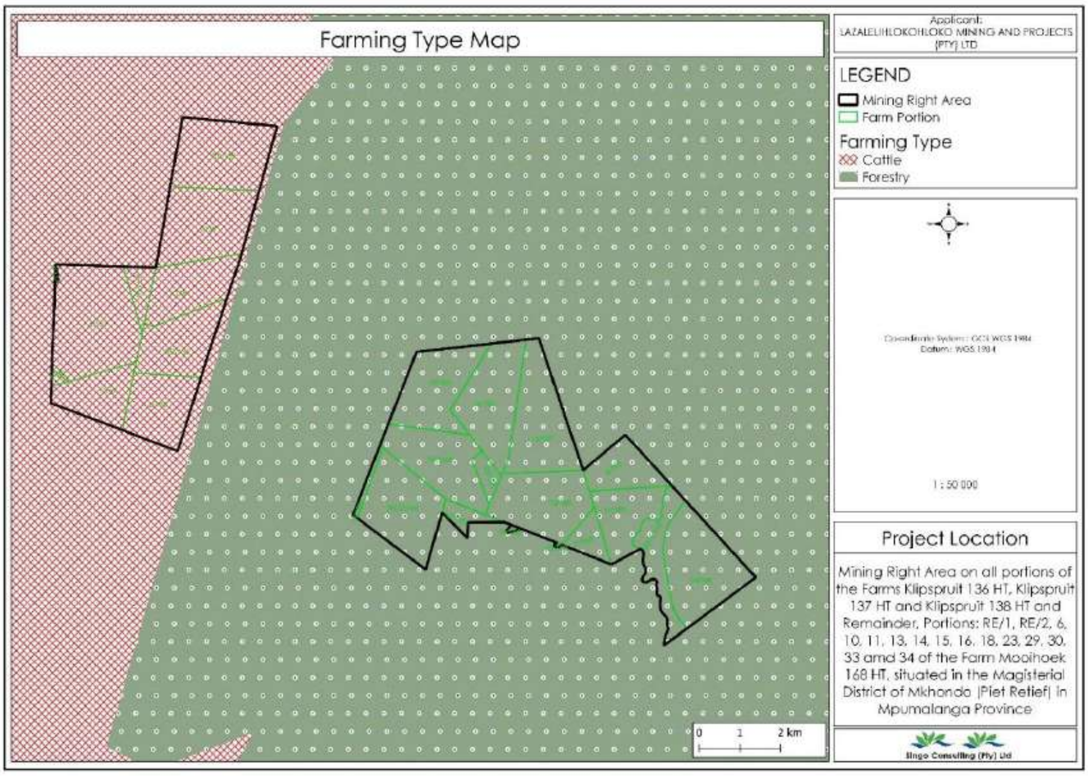
Freshwater Biodiversity Map



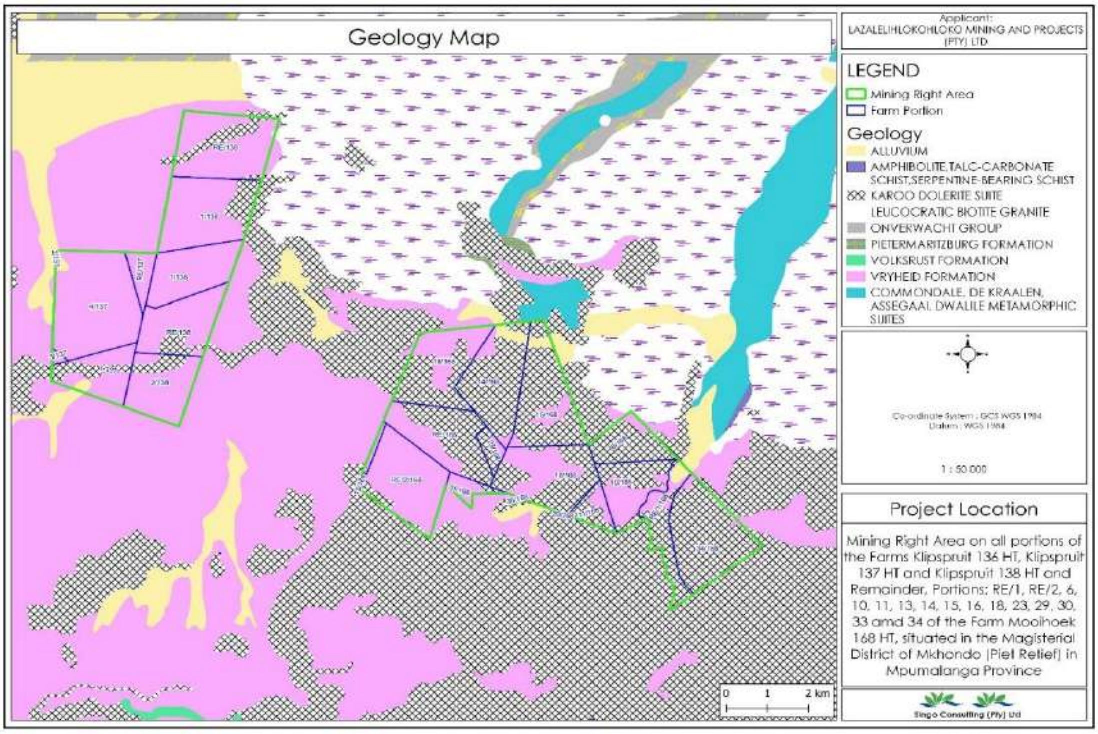
Terrestrial Biodiversity Map



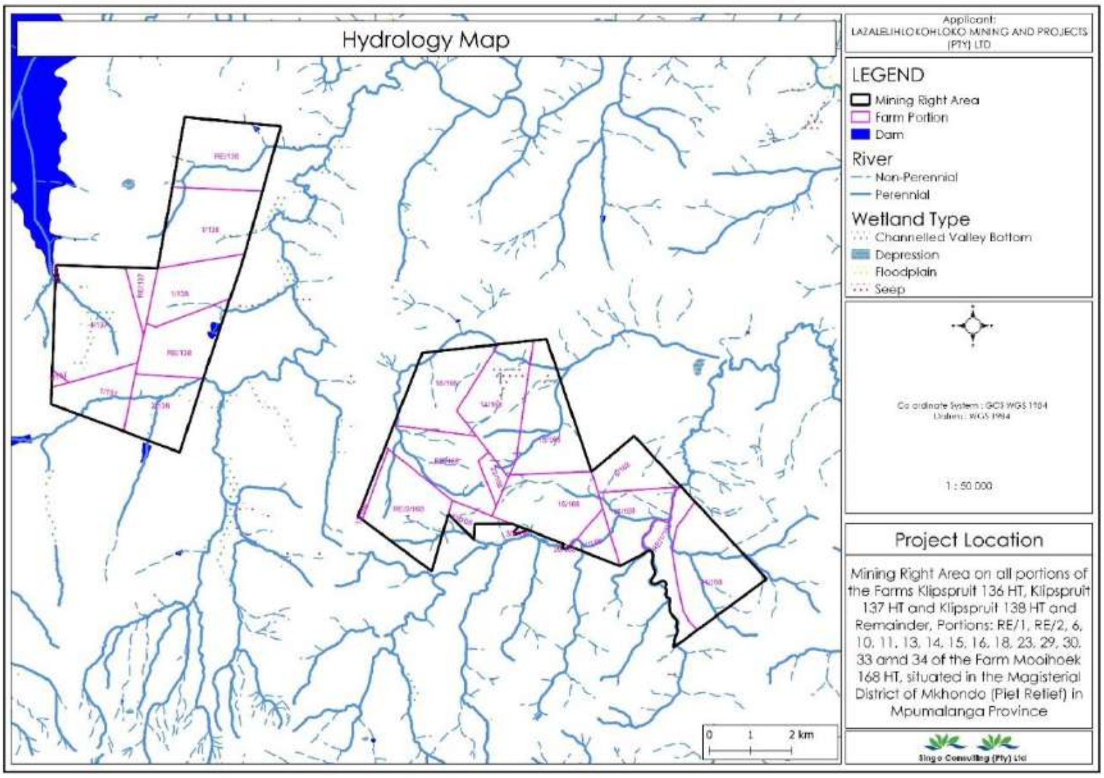
Buffer Zone Map



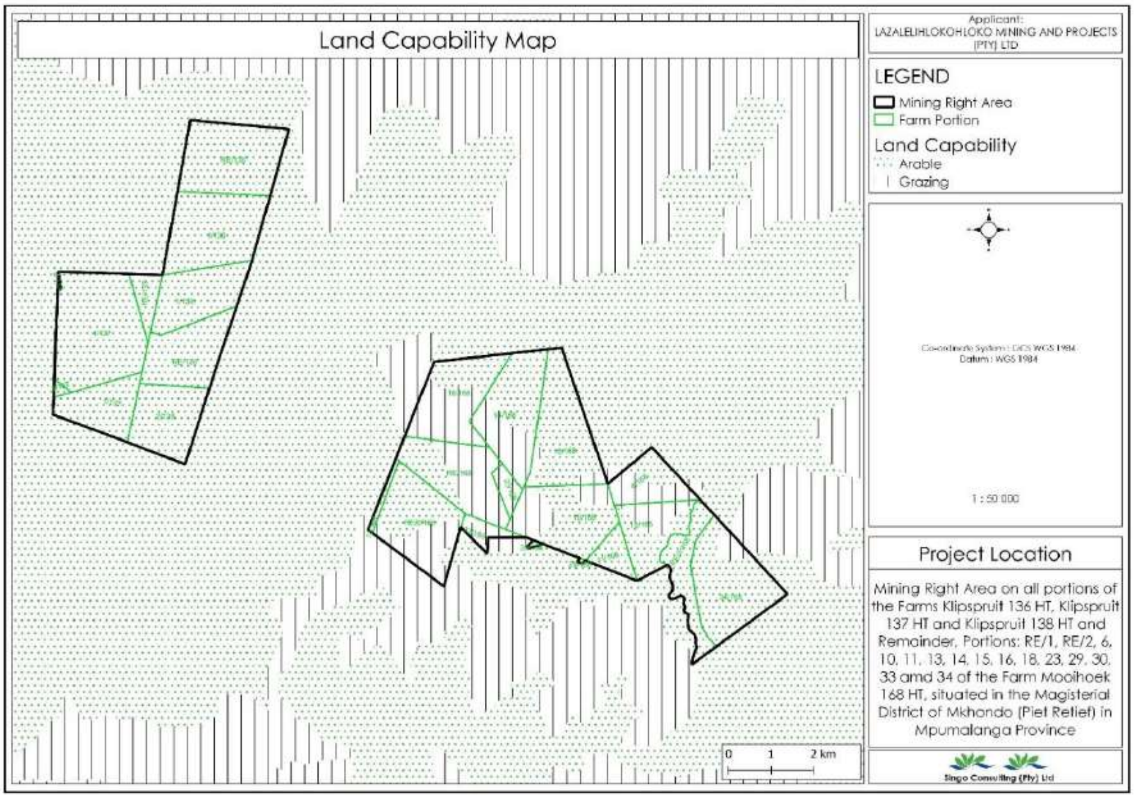
Farming Type Map



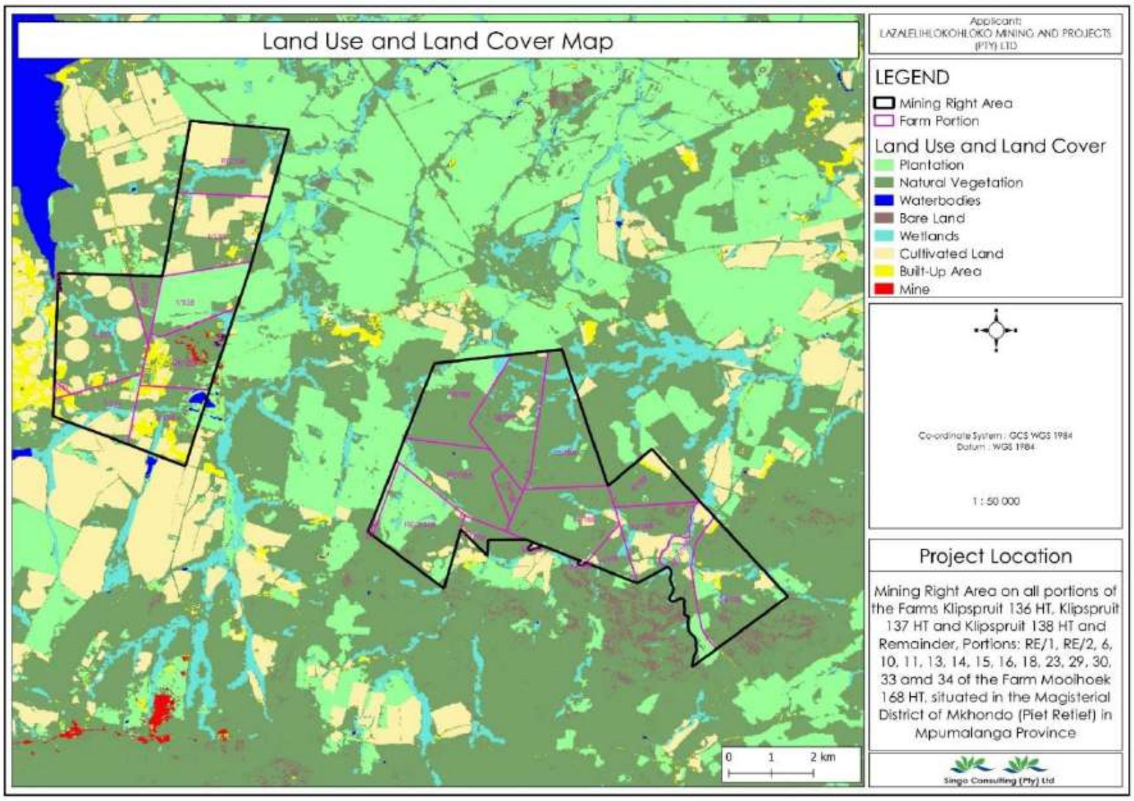
Geology Map



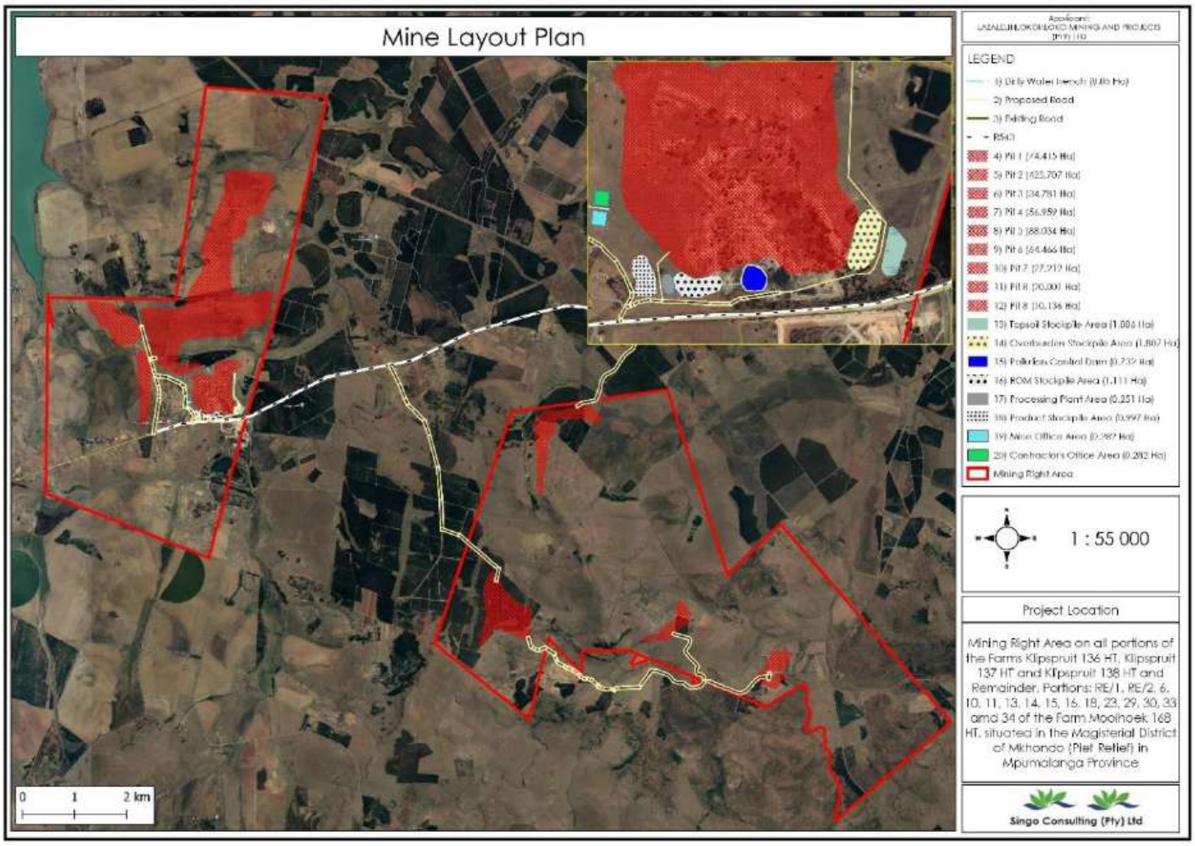
Hydrology Map



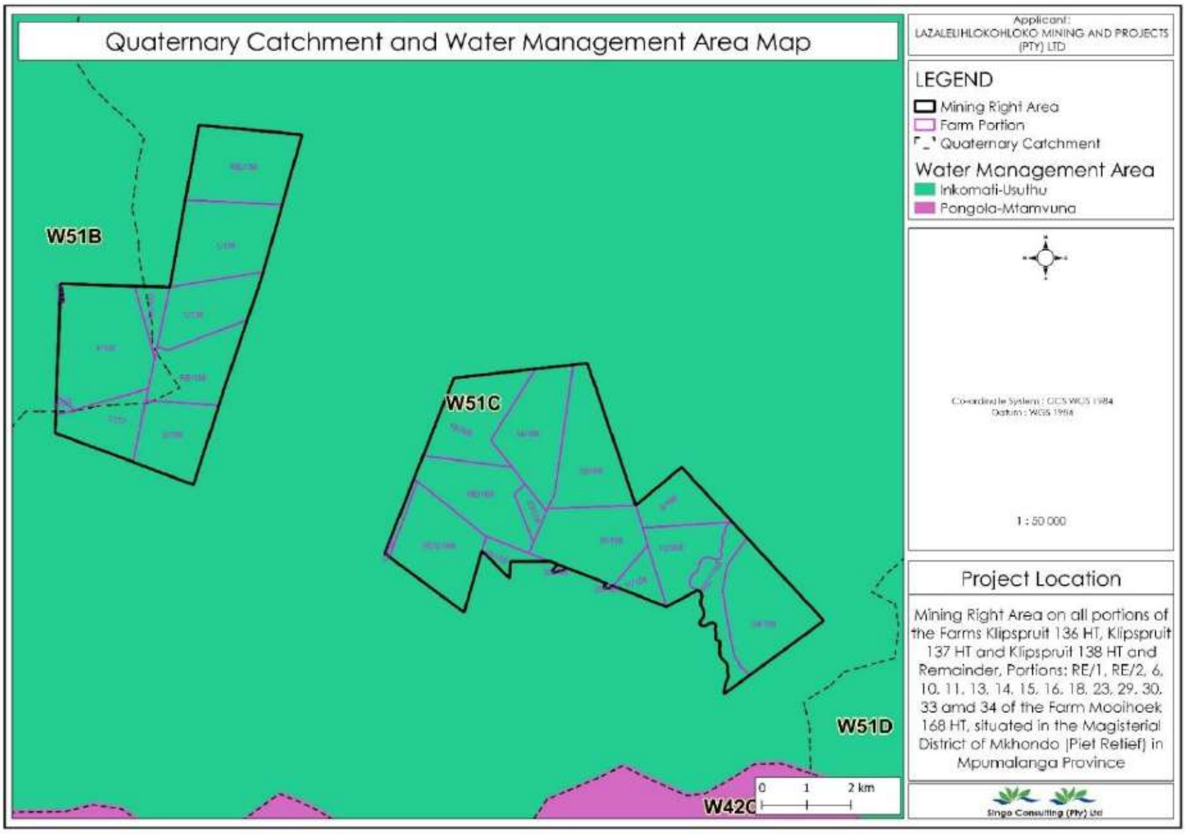
Land Capability Map



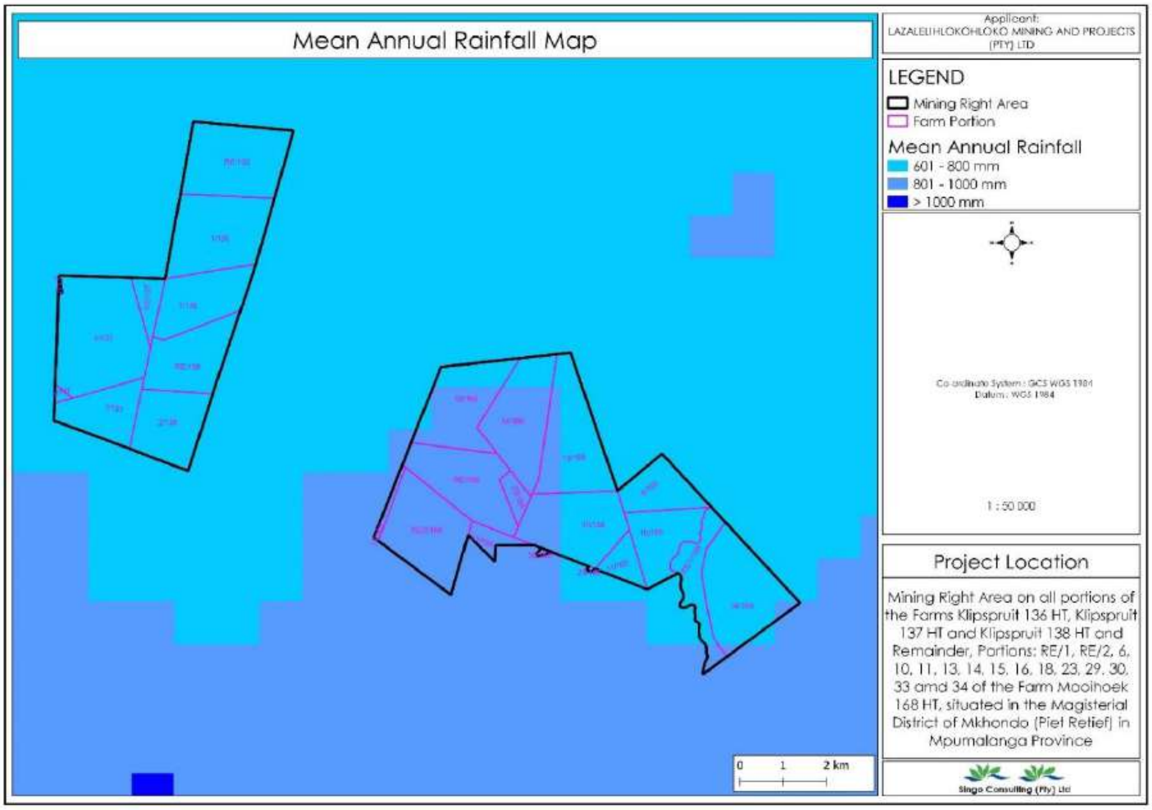
Land Use and Land Cover Map



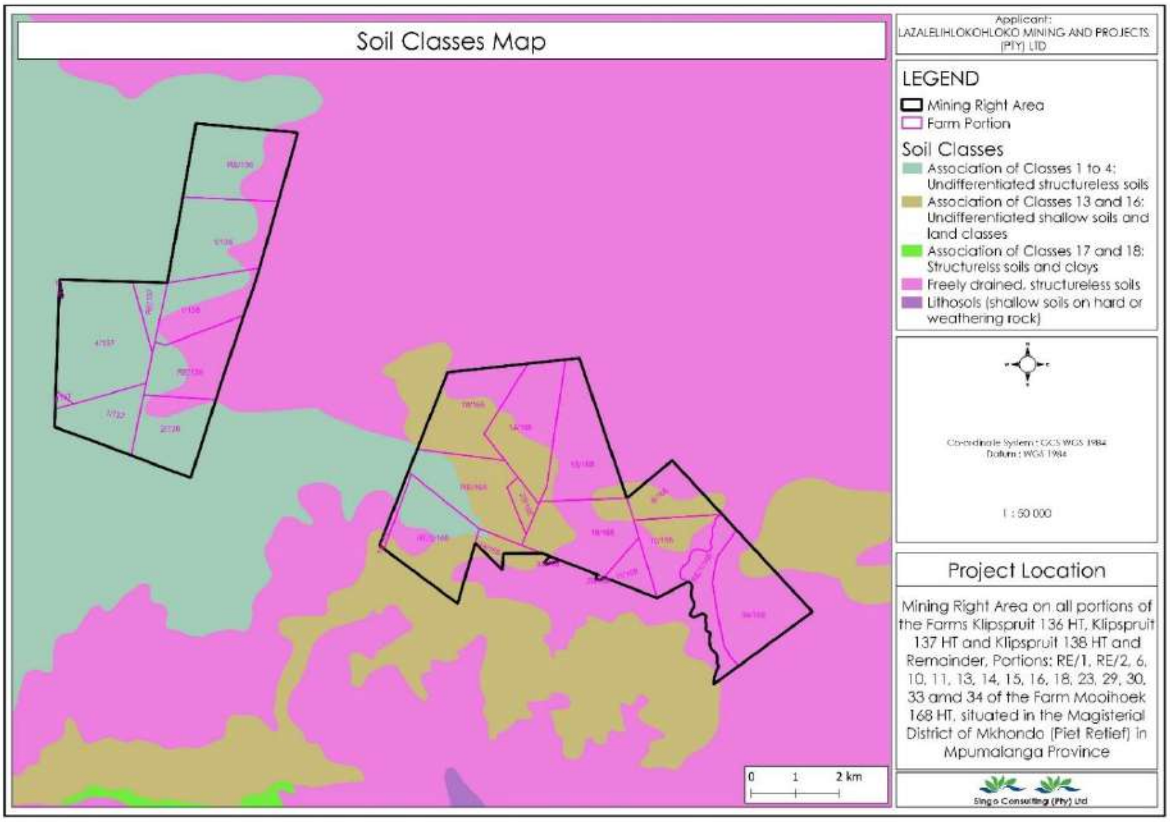
Mine Layout Plan



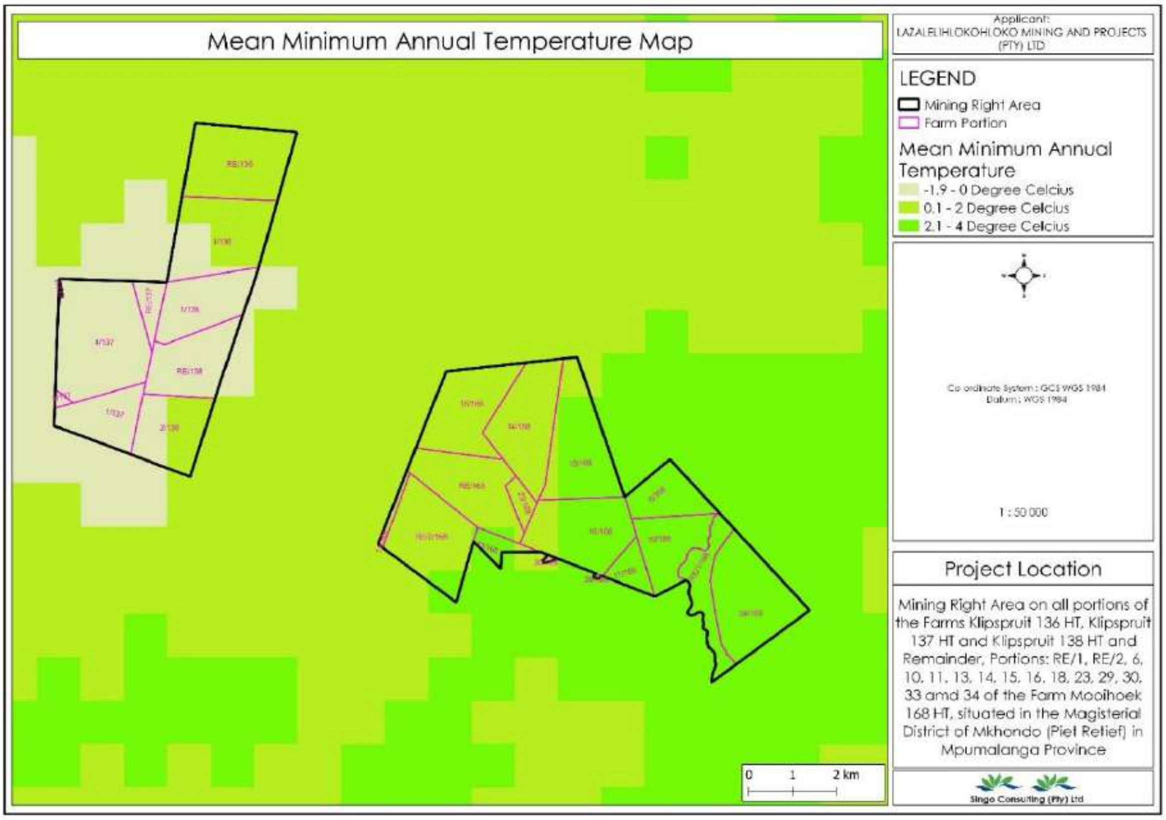
Quaternary Catchment and Water Management Area Map



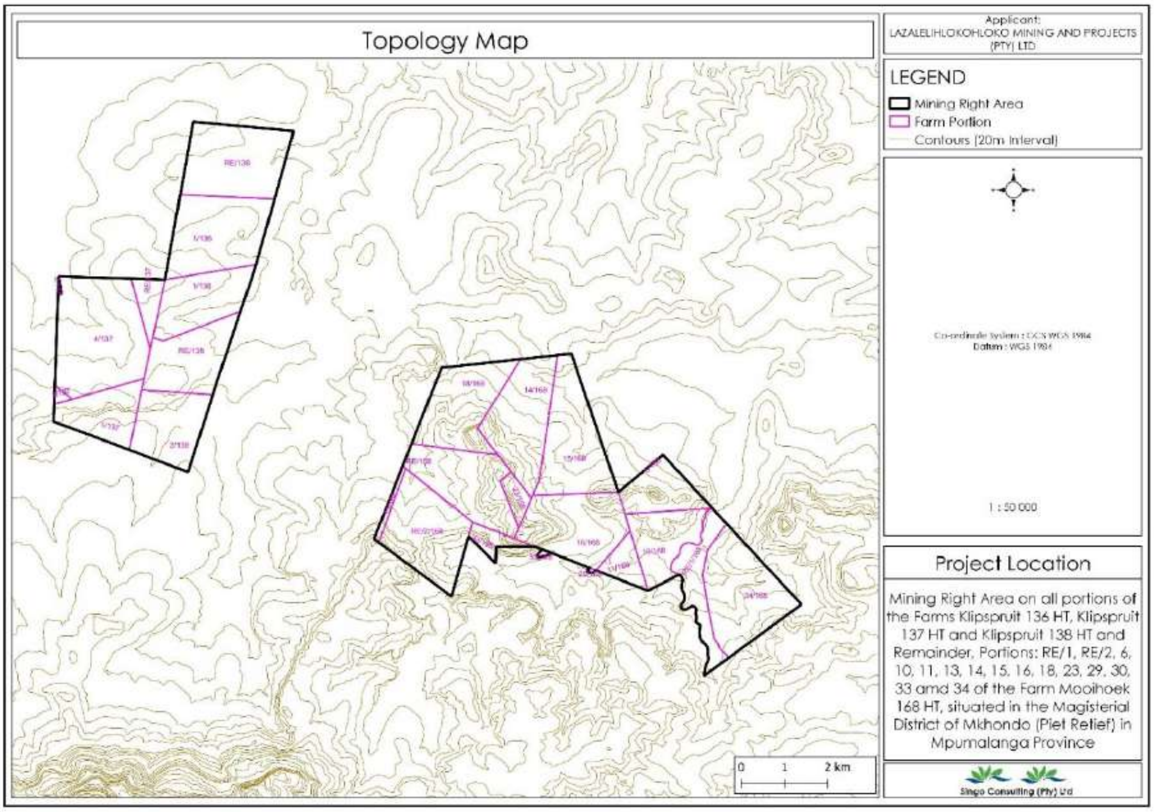
Mean Annual Rainfall Map



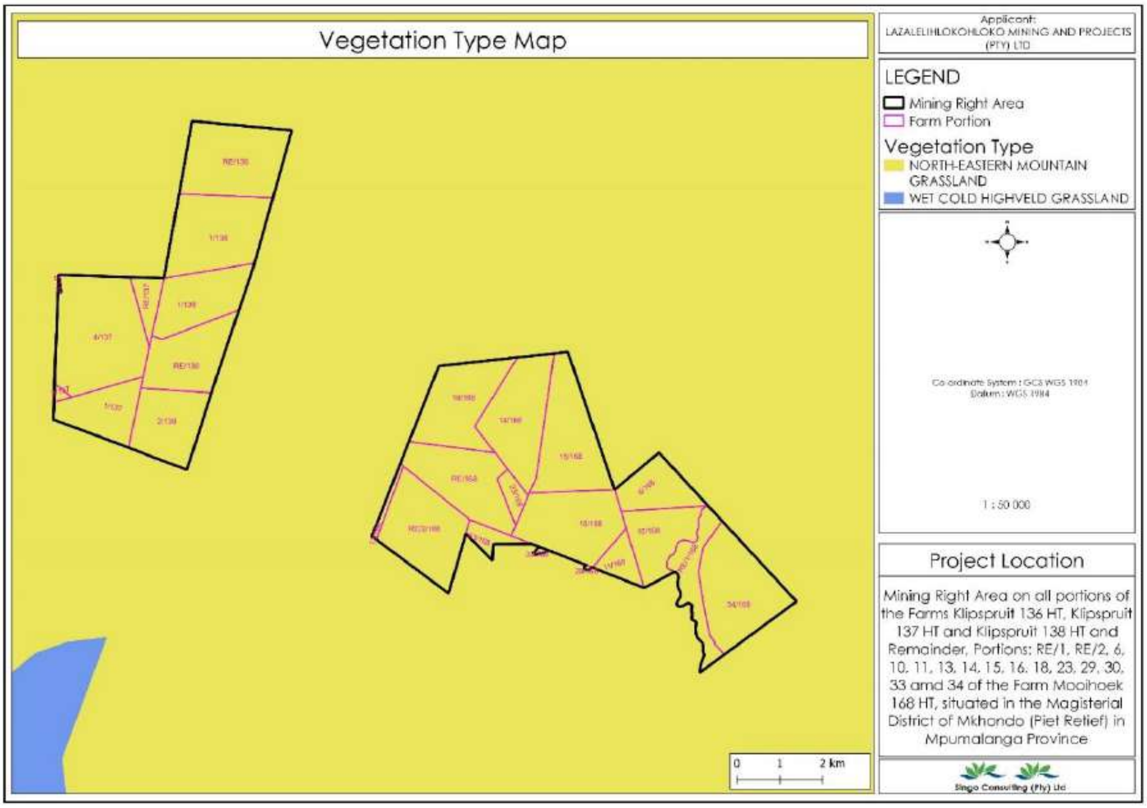
Soil Classes Map



Mean Minimum Annual Temperature Map

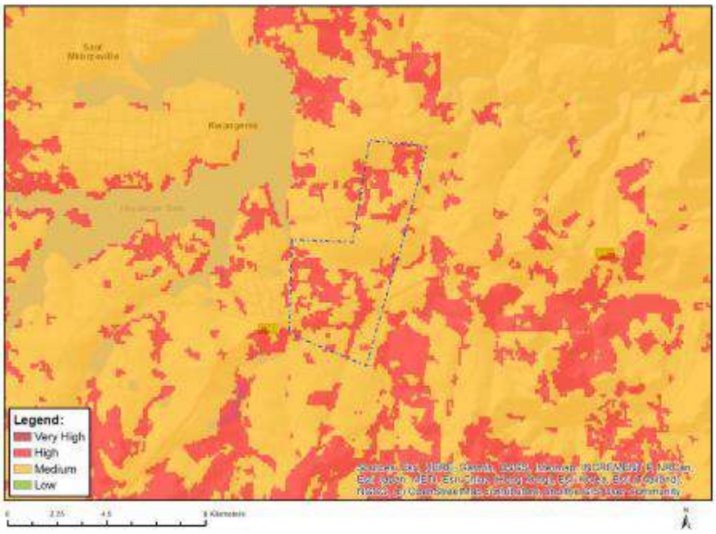


Topology Map

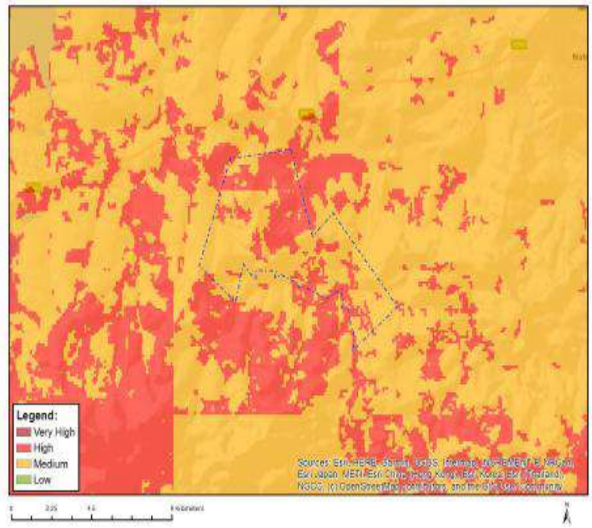


Vegetation Type Map

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



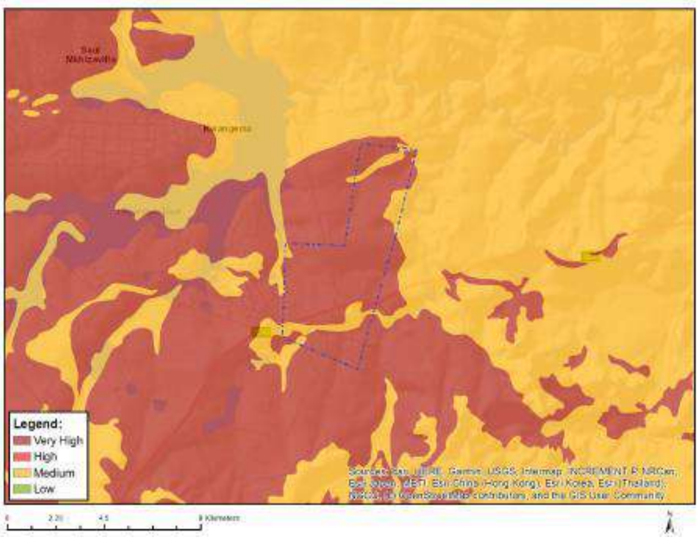
MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



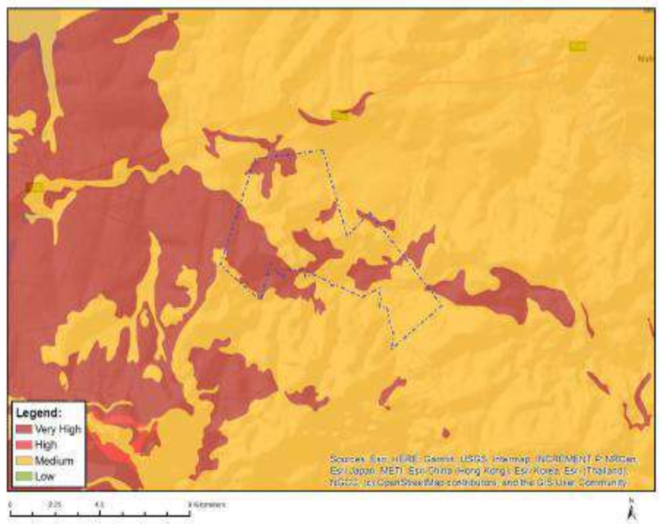
MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

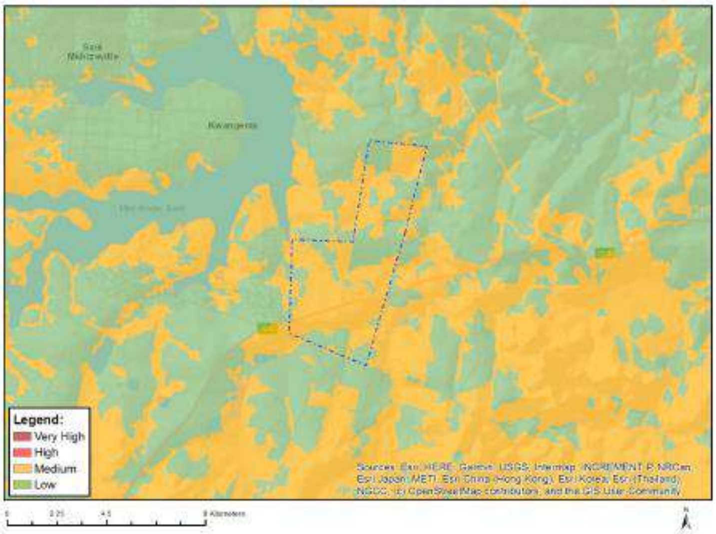
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



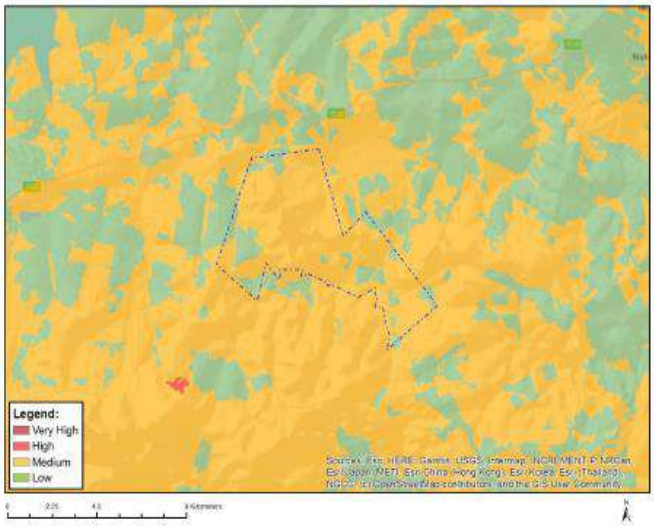
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



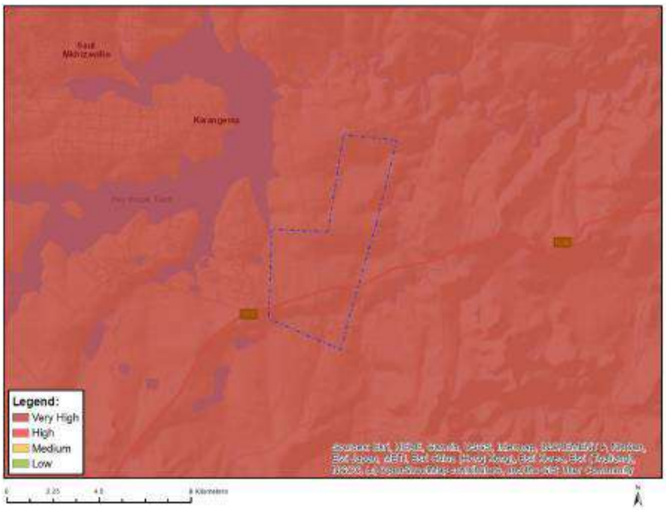
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



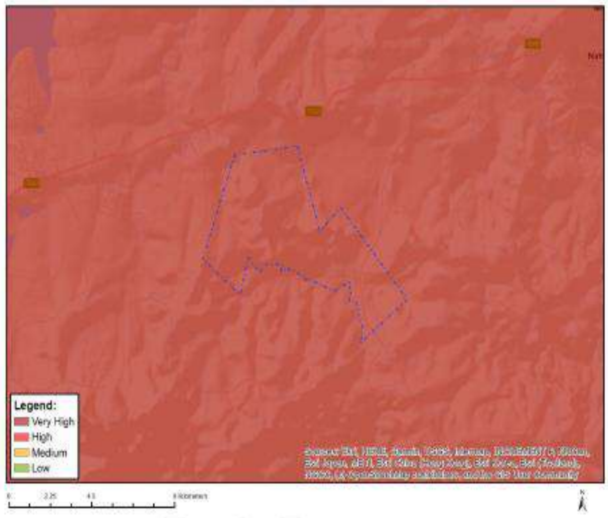
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

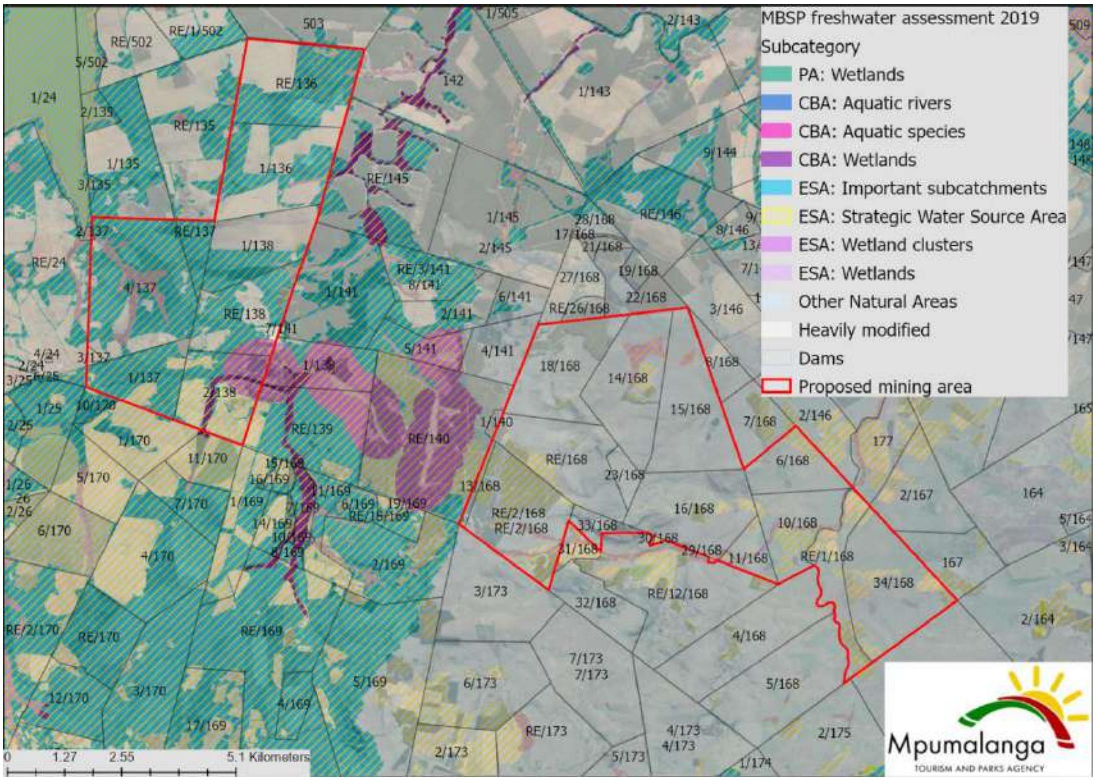


MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

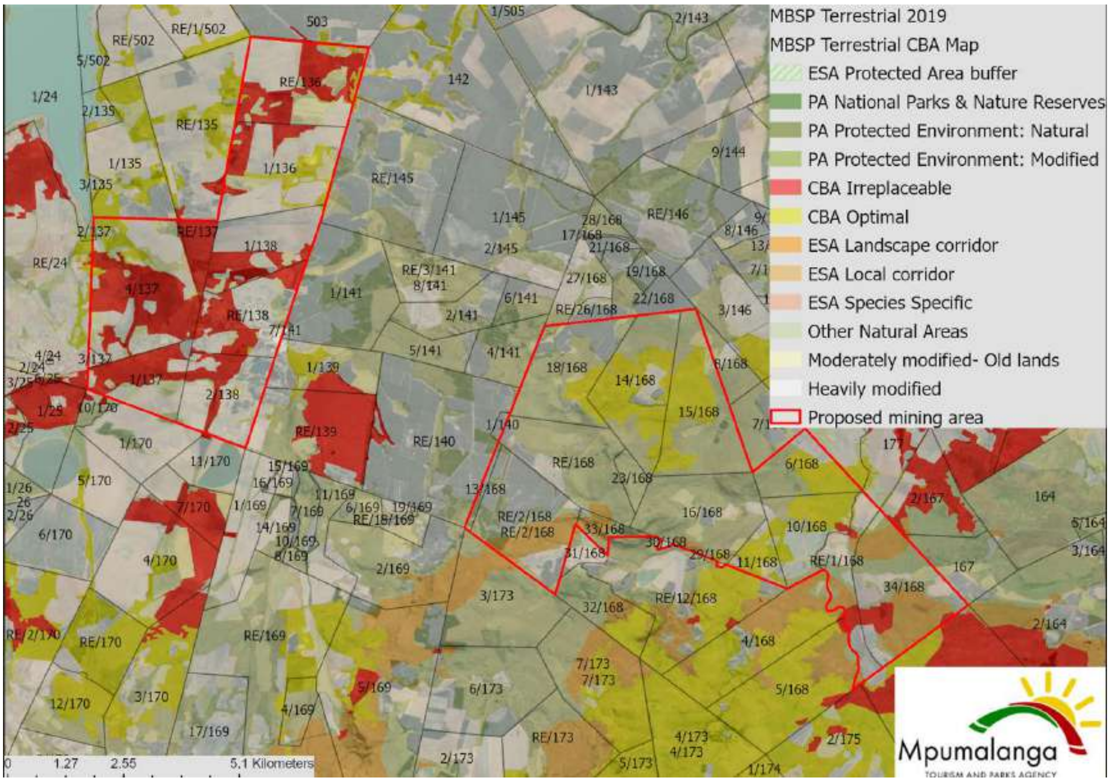


MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

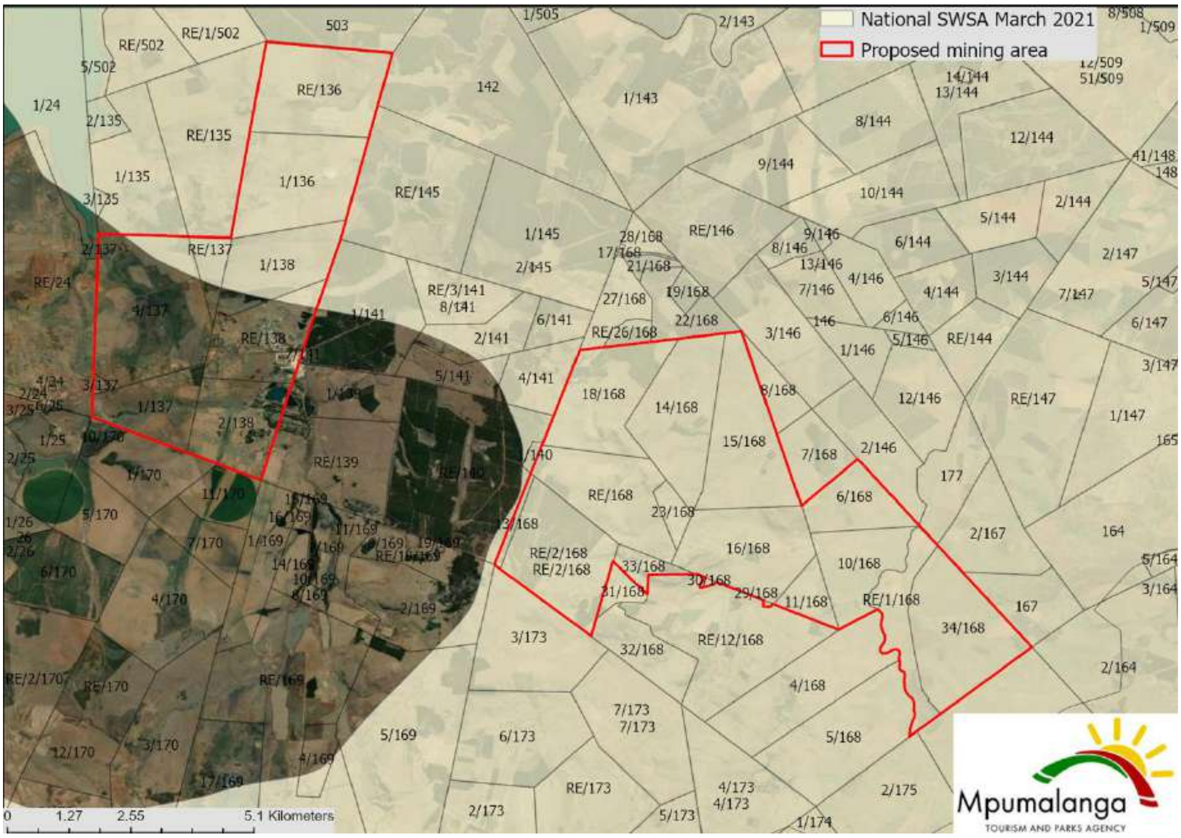




MBSP freshwater Assessment 2019 Map



MBSP Terrestrial CBA Map



National SWSA March 2021

Appendix 4: Public Participation Process followed

A. Newspaper

Bladsy/Page 4 | Excelsior Nuus / News | 26 April 2019

Excelsior

Deadline for all news articles should be in no later than Tuesday at 12:00

Tel.: 017 826 2176/2191
Fax: 017 826 2177
excelsior@lantic.net
19 Kruger Street
Piet Retief

"Wings for life" run for those who can't!

Wings for Life world run

Monique Potgieter

Come sunshine or rain on Sunday, 5 May 2019, at 11:00 UTC (Coordinated Universal Time) and 13:00 South African time, thousands of people will partake in this global charity run hosted by "Wings for life" all over the world.

With a moving finish line, a "catcher car" chases runners along a course designed by the organisers that are hosting at different locations all over the world. After about half an hour or a few kilometres the car should start passing runners, going faster until each runner is caught. Runners can celebrate their own personal achievement of kilometres run when they are caught. The last man or woman caught will be declared global champion. 92.14 km is the current record for the "Wings for life" world run. If you are not able to make it to one of the event locations you can download the Wings for Life World Run App and be chased by a Virtual Catcher Car at the same time as the rest of the people around the world. All entry fees and donations go directly to life-changing spinal cord research projects and clinical trials. For more information please visit the "Wings for life" website. www.wingsforlifeworld-run.com

A team from Piet Retief High School will also join in the fun at the event hosted in Centurion. They will participate in the race on behalf of the "Hope for Henno Organisation." Anyone is welcome to join their team or make a donation. For more information please contact Marijke de Waal on 084 469 8158.

NOTICE OF COAL MINING RIGHT APPLICATION, ENVIRONMENTAL AUTHORISATION, INVITATION TO PUBLIC MEETING AND AVAILABILITY OF THE SCOPING REPORT ON PORTIONS OF THE FARMS; MOOIHOEK 168 HT PORTIONS (RE 1, 2, 3, 6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33) KLIPSPRUIT 136 HT PORTIONS (RE, 1, 2, 3, 4) KLIPSPRUIT 138 HT PORTIONS (RE, 1, 2, 3, 4) LOCATED AT PIET RETIEF MAGISTERIAL DISTRICT, MPUMALANGA PROVINCE

This notice serves to inform all interested and affected parties that in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002); National Environmental Management Act (Act No. 107 of 1998) as amended (In April 2017) and the National Water Act of 1998, that **Lazalehlhlokohloko Mining and Projects (Pty) Ltd** intends to carry out environmental authorisation process (Scoping & Environmental Impact Assessment Reporting (S&EIR)) and an Integrated Water Use Licence Application (IWUL) for coal mining right with:

DMR Ref.: MP 30/5/1/2//3/2/1(10230)MR.

Description: Lazalehlhlokohloko Mining and Projects (Pty) Ltd holds a **prospecting right MP 30/5/1/1/2/5058 PR** and intends to establish a coal mine through both open pit and Indorground mining methods with associated infrastructures.

Project Location: The proposed mining right area is located approximately 24 km south-western side of Piet Retief, Magisterial District: Piet Retief under Mkhondo Local Municipality, Mpumalanga Province.

Size of the site: The application is on: Mooihoek 168 HT Portions (RE, 1,2, 3,6, 10, 11, 13, 14, 15, 16, 18, 26, 27, 29, 30, 33), Klipspruit 136 HT Portions (RE, 1, 2, 3, 4), Klipspruit 138 HT Portions (RE, 1, 2, 3, 4) and its approximately **7675.58640 ha.**

Notice of Scoping report: This serves to notify I&AP's of the mining right, environmental authorisation application and availability of the Scoping Report for public review for a minimum of 40 days from the **23rd of April 2019 to the 3rd of June 2019.** Report will be available at: **Piet Retief Public Library; Address 810 Retief Street (Longitude, 27.10: Latitude, -26.71).**

Telephone number: 017 826 8100 and fax number: 017 826 8129, can also be sent via e-mail upon request and via dropbox link from the EAP.

Notice and invitation to a Public Meeting: A **public meeting** will be held on **Thursday, the 2nd of May 2019 from 10:00 - 12:00 at Cili Hall, Kingdom Hall, Jehovah's Witnesses, 9 Botha Street at Piet Retief.** All interested and affected parties are welcome to attend the meeting.

A Water Use Licence Application (WULA) under the provisions of the National Water Act No. 36 of 1998 (NWA) is required for the mining operations. WULA will be applied for and submitted to the Department of Water and Sanitation as a request for Section 21 of the NWA. There are pans and wetlands around the Mining Right area, which must be authorised. It is anticipated that Lazalehlhlokohloko Mining and Projects (Pty) Ltd will require water for mining operations and potable use. There are associated tributaries and wetlands near the proposed mining right area. The development of the mine would therefore be 500 m away from the wetland. An integrated WULA application will be followed for the following water uses:

- 21(a) Abstraction from a borehole
- 21(c) and (i) Activities within 500 m of a wetland
- 21(g) Dust suppression
- 21(g) Coal stockpiling
- 21(g) Mine Residue Disposal
- 21(g) Dirty Water dam(s)

Other required Section 21 water uses will be detailed in the Scoping Report for public review.

For further information and more details of this article, please contact the following representatives as mentioned below:

Consultant Contact Person	Applicant Contact Person:
Singo Consulting (pty) Ltd Office No. 14, First Floor (South Block) Corridor Hill Crossing 9 Langa Crescent Corridor Hill, eMalahleni	Private Bag X 7294 Suite No. 13 Dieheuwel eMalahleni
Lead EAP: Siyabonga Mashigo Cell: 065 875 8194 Fax: +27 86 5144 103 E-mail: siyabonga@singoconsulting.co.za	Contact Person: Mtongeloa William Sindane
Assistant EAP: Rudzani Shonisani Cell: 078 548 1244/079 930 4772 Fax: +27 86 5144 103 E-mail: rudzani@singoconsulting.co.za	Cell: 072 896 3622 Fax: 086 505 2695 E-mail: wimprojects@gmail.com

Plaaslike talent geniet Ghoemas

Kate-Merie Ferreira

Op Woensdag, 17 April is die Ghoemas by die Sun Arena, Time Square Menlyn Main aangebied en hierdie spoggerige geleentheid is nie net deur bekroonde akteurs, aktrises en sangers bygewoon nie, maar ook deur Piet Retief se eie Michael Blignaut!

Michael is deur sy produksiemaatskappy, Starbend Promotions, genooi om as hul gas saam na die Ghoemas toe te gaan. Om 17:00 moes gaste by die Maslow Hotel, Time Square wees om te registreer as deel van die groep wat die aand se verrigtinge sou bywoon. 'n Ligte ete en drankies is bedien voor die toekennings om agtuur verfilm is.

"Toe ek al die bekendes om my begin raaksien, toe weet ek, ek is nou by die Ghoemas en wat 'n ongelooflike geleentheid was dit nie om met die ervare ouens in die bedryf te kon gesels nie," het Michael gesê. Om 19:30 moes almal hulle sitplekke inneem en om 20:00 het verfilming begin. Die hele Starbendgroep het saam gesit en so kon hulle al die bekende kunstenaars wat by die maatskappy geteken is, ontmoet.

Die aanbieder vir die aand was Willem Botha, hy het al die benoemdes in hulle verskeie kategorieë genoem, die wenners is aangekondig en elkeen het met trots sy Ghoema op die verhoog gaan ontvang. Demi Lee Moore het met vyf Ghoema-toekennings weggestap en Taryn Lamb met vier.

Na die Ghoema-vertoning is almal genooi vir 'n "Makietie" by die Altitude Champagne Bar, in die Maslow Hotel en daar is saam met van die grootste name in die musiek- en TV-bedryf gekuier.

"Dit was beslis 'n aand wat ek nooit sal vergeet nie en hopelik in die nabye toekoms sal 'n Ghoema-beeldjie vir my ook beskore wees."
- Michael Blignaut

Ons hoop saam met jou so Michael! Geluk aan al die wenners.

Violence and domestic abuse against men

The abuse no one talks about

Kate-Merie Ferreira

Stereotypes concerning violence and domestic abuse are almost exclusively geared towards women being the victims, when in fact, men are facing the same problems.

They are just not willing to come forward out of fear of being perceived as weak or less of a man.

Women are often seen as the weaker, gentler sex and men are seen as being stronger and more prone to violence, the expectation is that men are not allowed to cry or show emotion. Men regularly suffer under physical abuse like biting, spitting, kicking, hitting and being pushed around. Although the physical beatings can be brutal, emotional abuse is more of a struggle for the 'stronger sex".

Signs of emotional abuse include controlling and manipulative behaviour from female abusers. This entails withholding affection, threatening to kill themselves or others, threatening to take custody of the children, stalking, making the man feel like it's his fault or minimizing the abuse.

This behaviour from women is often excused with things like, "she was abused when she was younger", "she experienced severe emotional trauma" or "it's just the hormones". None of these are valid reasons for spousal abuse and behaviour like this should not be taken lightly.

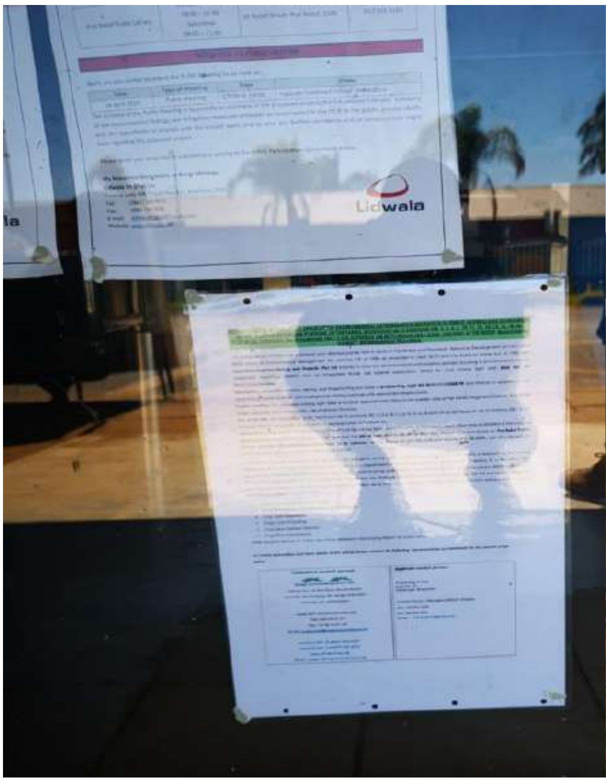
Men are far less likely to come forward and talk about the abuse and this feeds the problem, they often feel that the police can't help them or that they will not believe them.

If you find yourself in a situation like this, you are not less of a man for reporting it, there are people going through the same thing and staying in this harmful situation is not good for anyone. It is important to not retaliate when abuse is taking place, keep evidence of the abuse and report the issue immediately. You are not weak for coming forward and you are not alone!

For more information on abuse or for help when going through this situation, feel free to visit these websites or call one of the following numbers.

- National counselling line: 0861-322-322 - Counsellors help callers with challenges such as trauma, suicide, and relationship issues.
- Website: www.lifeline.co.za
- Stop Gender Violence helpline: 0800-150-150 - National toll-free helpline for survivors, witnesses and perpetrators of gender-based violence.
- Family and Marriage Association of SA:
- National office: (011) 975-7106/7
- E-mail: national@famsa.org.za
- Website: www.famsa.org.za

B. Site notice plugging



Appendix 5: Pictures depicting site conditions



Appendix 6 : Screening Report

Appendix 7: Financial provision

CALCULATION OF THE QUANTUM

LAZALELIHLOKOHLOKO MINING AND PROJECTS (PTY) LTD

Applicant:

Evaluator: **Abel Mojapelo**

DMRE REF No: IMP 30/5/1/2/3/2/1(10230) MR

Date: Nov-22

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0,251	17,14	1	1	4,30214
2 (A)	Demolition of steel buildings and structures	m2	0	238,71	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	351,79	0,1	1	0
3	Rehabilitation of access roads	m2	0,8118	42,72	1	1	34,680096
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414,61	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226,15	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	477,42	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	801,716	242984,15	0,01	1	1948042,808
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	5,001	166847,44	0,07	1	58408,28332
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	207805,47	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,732	603565,59	1	1	441810,0119
9	Rehabilitation of subsided areas	ha	0	139709,6	1	1	0
10	General surface rehabilitation	ha	808,308	132171,31	0,02	1	2136702,545
11	River diversions	ha	0	132171,31	1	1	0
12	Fencing	m	0	150,77	1	1	0
13	Water management	ha	0,782	50255,25	1	1	39299,6055
14	2 to 3 years of maintenance and aftercare	ha		17589,34	0,06	1	0
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		4624302,236

1	Preliminary and General	554916,2683	weighting factor 2 1	554916,2683
2	Contingencies	462430,2236		462430,2236
			Subtotal 2	5641648,73
			VAT (15%)	846247,31
			Grand Total	6487896

SIGN Abel Mojapelo

DATE 2022/11/11

Appendix 8: Specialist studies conducted