



mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED)

NAME OF APPLICANT: **KOKERBOOMBERG MINING (PTY) LTD**

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FILE REFERENCE NO SAMRAD: **NC30/5/1/3/2/10971MP**

1. IMPORTANT NOTICE

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

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

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

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

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

2. Objective of basic assessment process

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

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

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PART A
SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact person and correspondence address

a) Details of

i) Details of the EAP

EIM Sustainability Solutions (Pty) Ltd

Name of the Practitioner: Jana Geeringh
Tel No: 083 276 6292
Fax No: N/A
E-mail address: jana.g.eim@gmail.com
Postal Address: 6 Shorten str
Rynfield
Benoni
1501

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(With evidence).

See J. Geeringh's CV attached as Appendix A

- BSc. Geology and Chemistry - North-West University
Potchefstroom
- BSc. Hons. Environmental Geology - North-West University
Potchefstroom.

(2) Summary of the EAP's past experience

(in carrying out the Environmental Impact Assessment Procedure)

J. Geeringh has three years overall Environmental Management experience. Main procedures include the compilation and review of BAR's and Environmental Auditing. The EAP's main industry is the Dimension stone industry and has been consulting in the industry for three years. Other industries include Aggregate mining and Rehabilitation of land.

b) Location of the overall activity

Farm name:	Middel Post no. 60
Application area (Ha):	±1.10 Ha
Magisterial district:	ZF Mgcawu Magisterial district
Distance and direction from nearest town:	Approximately 34km South-East of Kakamas
21 Digit surveyor general code for each farm portion:	C03600000000006000000

c) Locality map

(show nearest town, scale not smaller than 1:250 000).

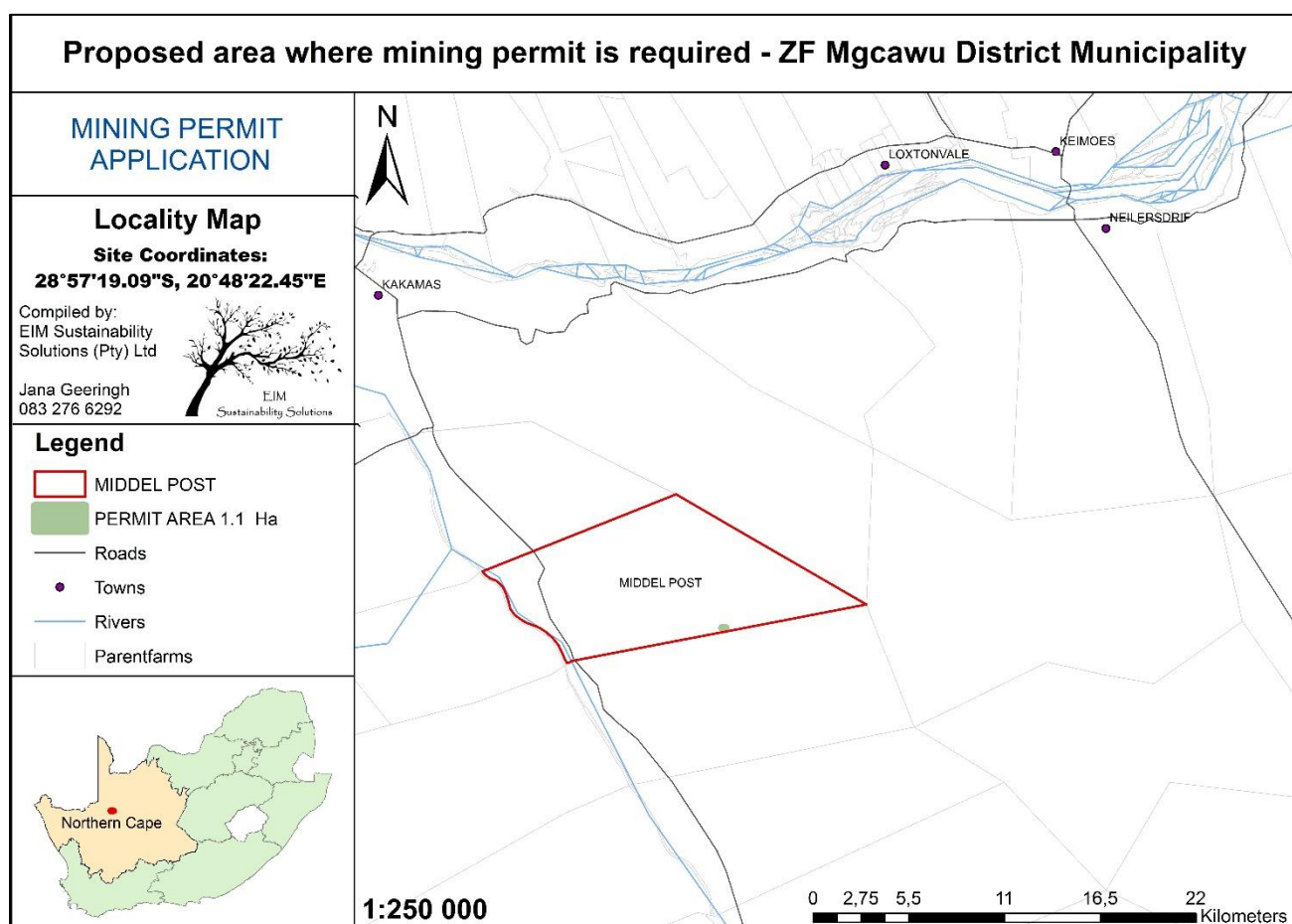


Figure 1: Locality plan of the proposed mining site.

The locality plan is also attached as Appendix B.

d) Description of the scope of the proposed overall activity.

This mining permit application is for Rose Quarts (Gemstone - GRq), Feldspar (Fs) and minerals associated with Feldspar mining, with a total area/footprint of not more than 5ha in size.

The development footprint comprises of one site (permit area) where a maximum area of 1.1ha will be exploited.

After being extracted, the material will directly be transported from the site to the closest harbour for export. The existing road system will be utilised during the entire mining and transportation processes.

The only temporary (portable) structures for site establishment includes a portable toilet (location must still be determined).

The site requires no crushing or screening plants since none of these activities will take place on-site. The extraction process requires no water and employees will be supplied with potable water.

Proposed site layout, indicating midpoint of reef outcrop and existing roads

20°48'25"E

Midpoint of reef

Legend

- Existing Road
- Application area 1.1ha

Source: Esri, DigitalGlobe, GeoEye, IGNES/Airbus DS, USDA, USGS

20°48'25"E

28°57'20"S

28°57'20"S

Mining Permit Application - Site Layout plan
Created for: Kokerboomberg Mining (Pty) Ltd
Created by: EIM Sustainability Solutions (Pty) Ltd

Contact: Jana Geeringh
083 276 6292
jana.g.eim@gmail.com

EIM
Sustainability Solutions

Figure 2 : Proposed site layout plan for Mining permit activities on Middel Post no. 60

(i) Listed and specified activities

Table 1: Listed and specified activities

NAME OF ACTIVITY (Eg for mining – blasting site, site camp, ablution facility, accommodation, equipment storing, sampling storage, site office, access route etc.	AERIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY Mark with X where applicable or affected	APPLICABLE LISTING NOTICE (GNR 983, 984, 985)
Mining	Less than 1.1 ha	X	NEMA, GNR 327, 21 (a)
- Excavations			
- Back filling			
- Rehabilitation			
- Trucks for loading and transportation off-site			
- Portable toilet (Install and decommission)			
Roads (Not required)	Already present on the site	N/A	N/A

(ii) Description of the activities to be undertaken

(Describe the Methodology or technology to be employed, including the type of commodity to be prospected/mined for a linear activity and a description of the route of the activity)

The application of this mining permit is to mine Rose Quarts (Gemstone) as well as Feldspar (Fs) and its associated minerals which include Mica (Mc), Beryl (Gemstone – GB), and in rare cases Bismuth (Bi).

Invasive mining activities include:

- Excavation of materials using explosives (blasting), excavators and a TLB.
- Transportation of extracted material, using existing roads, to closest harbour for export.

The total area to be excavated is less than 1.1ha. The mined material is directly transported off site, using existing roads, for export from the closest harbour. No further handling (screening/ crushing) is done on-site. No water is required for the mining activities.

Rehabilitation of the mined area will take place after the mine is decommissioned. Rehabilitation will include in-filling/ back-filling of mined sections to some extent and sloping/ contouring of the remaining excavations to achieve a safe slope angle. Concurrent rehabilitation will take place in areas where mining has ceased. Since almost all materials that are excavated are sold as product, the remaining debris will be used as backfill material during concurrent rehabilitation. This also means that no waste rock dumps/ residue stockpiles will be applicable to the operation.

e) Policy and legislative context

Table 2: Policy and legislative context

APPLICABLE LEGISLATION AND GUIDELINES TO COMPILE THE REPORT <small>(a description of the policy legislative context within which the development is proposed including an identification of legislation, policies, plans guidelines that are applicable to this activity and are to be considered in the assessment process)</small>	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT <small>(e.g. in terms of the NEMWA Water use licence has/has not been applied for)</small>
National Environmental Management Act (NEMA), No. 107 of 1998 Environmental Impact Assessment (EIA) Regulations, Listing Notice 1 of 2014, as amended (GN. R. 327), 21(a)	Earthworks for the excavation and removal of mined material from an area not larger than 5ha.	EIM Sustainability Solutions (Pty) Ltd is applying on behalf of the client for an Environmental Authorisation (EA) through this Basic Assessment Report (BAR) and Environmental Management Programme report (EMPr).
National Environmental Management Act (NEMA), No. 107 of 1998 Environmental Impact Assessment (EIA) Regulations, Listing Notice 1 of 2014, as amended (GN. R. 327), 27	LESS than 1ha of indigenous vegetation will be cleared.	An area less than 1ha will be cleared since the entire application area will not be exploited and the rocky outcrops have little to no vegetation present. This activity is thus not triggered.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations	The mining process generates very little dust and is of extremely small scale.	Air Quality Licence will not be applied for.
Mine Health and Safety Act of 1996 (Act 29 of 1996)	Controlling of airborne particles Highwalls in the current area –Safety Noise generation	These measures are included in the EMPr.
National Water Act 1998, (Act No 36 of 1998)	Water use for operation is not required.	This activity is not applicable.
DMR Compliance Audit as required in terms of Section 29 of the Minerals and Petroleum Resource Development Act, No. 28 of 2002	Annual Environmental Performance Assessments (AEPA)	Annual Environmental Performance Assessments when the mining activities are taking place.
National Environmental Management: Biodiversity Act, No. 10 of 2004 (GN. R. 152)	Potential protected, endangered, vulnerable, or threatened plant species identified on the site.	Captured in EMPr. No species in terms of NEM:BA were identified on-site.

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development and listed activities)

Kakamas and its surrounding areas are areas in the Northern Cape Province with great potential for development. The proposed development will not only provide additional employment for surrounding community members it will also ensure that employees who have formed part of previous mining activities, under different environmental authorisations, on the property have a sustained income.

In addition, the proposed development will provide other industries/ companies (persons/ businesses handling and selling the materials after acquisition) the opportunity to provide skilled and unskilled employment opportunities for persons (potential permanent and temporary employment opportunities).

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

The farm to which this application relates, for Rose Quartz, Feldspar, and other minerals, is owned by the Applicant, Kokerboomberg Mining (Pty) Ltd (represented by Mrs. Antoinette Lerm), as per Appendix C.

No additional road networks, infrastructure or equipment will be required if the site is located at the proposed location.

No water will be required for the operation; hence the site location can be and is located where water is a scarce resource.

The minerals to be mined outcrops at the location where the site is currently proposed and will require no additional technologies since the operation will follow the vein where it outcrops on the surface.

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

(NB This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by I&AP's and the consideration of alternatives to the initially proposed site layout.)

i) Details of the development footprint alternatives considered.

(With reference to the site plan provided as Appendix D and the location of the individual activities on site, provide details of the alternatives considered with respect to:

- (a) The property on which or location where it is proposed to undertake the activity,**
- (b) The type of activity to be undertaken,**
- (c) The design or layout of the activity,**
- (d) The technology to be used in the activity,**
- (e) The operational aspects of the activity and**
- (f) The option of not implementing the activity.**

- a) The property on which the proposed activity will be undertaken is on the farm Middel Post no. 60, in the Northern Cape Province. No alternatives to this site will be considered since mining is specific to the geological resources on the property known as Middel Post no. 60.
- b) The main activity of this development triggers activity 21 in the Government Notice 327 of the NEMA EIA Regulations of 2014 (as amended), and is described as:

Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including —

(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource[.]; or **[including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]**

(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies

No main alternative activities that are triggered in this Government Notice have been considered. This is purely because it does not align with the fundamental need of this development, which is to engage in mining activities, which is a baseline requirement for the determination of the feasibility and viability of a potential mining operation.

- c) The design and layout of the activities are not yet of cardinal importance since the impacts of the mining activities is likely to be minimal. Therefore, no alternative layout or designs have been considered. The applicant has however already confirmed that mining will only take place within areas that have already been identified.
- d) The technologies and required equipment that will be utilised during this small-scale mining operation are proven. The mining method (mechanical method) is of such design that the development footprint will be minimised since it only targets the outcrop area. As a result, no alternative technologies and/ or equipment have been considered. The applicant will however consider improved technologies, if and when available.
- e) The entire operational process of the activities is documented in section 3 d (ii). The mining application minimises potential impacts on the environment since it is to a reasonable extent only targeting minerals that outcrops on the surface.
- f) The option of not implementing this activity defies the reason for the application in the first place and is therefore not considered.

ii) Details of the Public Participation Process Followed

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

The consultation guidelines as provided by the Department of Mineral Resources are utilised to perform the public participation process. All potential interested and affected parties were identified and formally notified. Informed parties were also given access to a background information document of the proposed mining application (See Appendix E).

This appendix includes proof and the acknowledgement of receipts proving that the potential interested and affected parties were notified. EIM Sustainability Solutions have not yet received acknowledgement of receipt of emailed notifications. Correspondence from interested and affected parties is also included under this Appendix E. See Table 3 below for a summary of the public participation.

Table 3: Details of the public participation process

DATE	ACTION	
	The display of a weather resistant (Correx board – 600 mm X 400 mm – A2) site notice at the main entrance gate. Photos of the site notice is attached (Appendix F).	
	The following landowners and lawful occupiers of surrounding properties were notified by means of written notices and a background information document of the Mining Right application and public participation process, allowing them a 30-day commenting period and the opportunity to register as an interested or affected party:	
	Landowners / Occupants	Relevance
	Kokerboomberg Mining (Pty) Ltd.	The area where the mining will take place
	The following mining companies operating on surrounding properties were notified by means of written notices of the Mining Right application and public participation process, allowing them a 30-day commenting period and the opportunity to register as an interested or affected party:	
	Mining companies	Relevance
	N/A	
	The following government departments and local authority divisions were notified by means of written notices (sent per registered mail or email) of the Mining Right application and public participation process in terms of NEMA, allowing them a 30-	

	day commenting period and the opportunity to register as an interested or affected party:	
	Department	Relevance
	ZF Mgcawu District Municipality	Mining Site falls in ZF Mgcawu District Municipality
	Kai !Garib Local Municipality (NC082)	Mining Site falls in Kai !Garib Local Municipality
	Northern Cape Heritage Resources Authority	To confirm that there aren't any heritages site near the mining site
	Northern Cape Department: Economic Development and Tourism	Does the mining site affect the Economic Development and Tourism of the area
	Northern Cape Department: Roads and Public Works	Does the mining site affect the roads and public works of the area
	Northern Cape Department: Transport, Safety and Liaison	Does the mining site affect Transport, Safety and Liaison
	Northern Cape Tourism	Does the mining site affect Tourism
	Hard copies of the Draft Basic Assessment Report & EMPR were delivered by hand to the following parties:	
	Party	Accepted by
	Electronic copies of the Draft BAR & EMPR to:	
	Party	Accepted by
	ZF Mgcawu District Municipality	
	Kai!Garib Local Municipality (NC082)	
	Northern Cape Heritage Resources Authority	
	Northern Cape Department: Economic Development and Tourism	
	Northern Cape Department: Roads and Public Works	
	Northern Cape Department: Transport, Safety and Liaison	
	Northern Cape Tourism	
	Kokerboomberg Mining (Pty) Ltd.	

iii) Summary of issues raised by I&Aps

(Complete the table summarising comments and issues raised, and the reaction to those responses)

The Kai!Garib Local Municipality stated that before mining can commence, a rezoning application must be submitted, as the site at the zoned as an intensive agriculture site, according to the municipality, and must therefore be rezoned.

Table 4: Issues rose by interested and affected parties.

NOTE: This section of the document will be completed once the Draft Report reviewing phase has been completed.

Interested and Affected Parties <small>List the names of persons consulted in this column, and mark with X where those who must be consulted were in fact consulted</small>		Date of comments received	Issue raised	EAPs responses to issues as mandate by the applicant	Section and paragraph reference in this report where the issues and/or responses incorporated.
AFFECTED PARTIES					
Landowner/s	X		No comments or issues where raised.		
Lawful occupier/s of the land			No comments or issues where raised.		
Landowners or lawful occupier/s on adjacent properties	X		No comments or issues where raised.		

Interested and Affected Parties <small>List the names of persons consulted in this column, and mark with X where those who must be consulted were in fact consulted</small>		Date of comments received	Issue raised	EAPs responses to issues as mandate by the applicant	Section and paragraph reference in this report where the issues and/or responses incorporated.
Municipal councillor	X		No comments or issues where raised.		
Municipality	X	25/11/2021	Rezoning application is required in terms of SLPUMA, 16 of 2013.	Arranging a meeting with the Municipality to determine whether rezoning is necessary. Since the owners of the land has raised the issue that they are zoned extensive agriculture and not intensive agriculture. The land is not arable as is evident from site photos included in this document.	See Appendix E of the BAR and EMPr
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA, etc.	X		No comments or issues where raised.		
Communities			No comments or issues where raised.		
Traditional Leaders			No comments or issues where raised.		

Interested and Affected Parties List the names of persons consulted in this column, and mark with X where those who must be consulted were in fact consulted		Date of comments received	Issue raised	EAPs responses to issues as mandate by the applicant	Section and paragraph reference in this report where the issues and/or responses incorporated.
Other Competent Authorities affected			No comments or issues where raised.		
OTHER AFFECTED PARTIES			No comments or issues where raised.		
INTERESTED PARTIES			No comments or issues where raised.		

i. The environmental attributes associated with the alternatives.

(The Environmental attributes described must include socio-economic, social, heritage, cultural geographical, physical and biological aspects)

The most significant influencing feature of the area's topography is the Hartbees River that can be found to the west of the property (stretching from south-east to north-west) draining towards the Orange River. Hence the slight slopes from East-North-East to West-South-West of the farm Middel Post no. 60.

Except for the few small hills (koppies) that can be observed from the site, the larger portion of the landscape can be described as undulating, draining down towards the Hartbees River.

The farm Middel Post no. 60 has two slightly more significant drainage lines and several small seasonal drainage lines.

Elevation drops from approximately 797 m to about 696 m (Hartbees River elevation) over a distance of approximately 10 km, with a maximum slope of 5.4% and an average slope of only 1.6%. The red arrow in the Figure below indicates the position of the site along the profile and indicates that the site can be found at an elevation of 796 m with a slope of 0.7%.

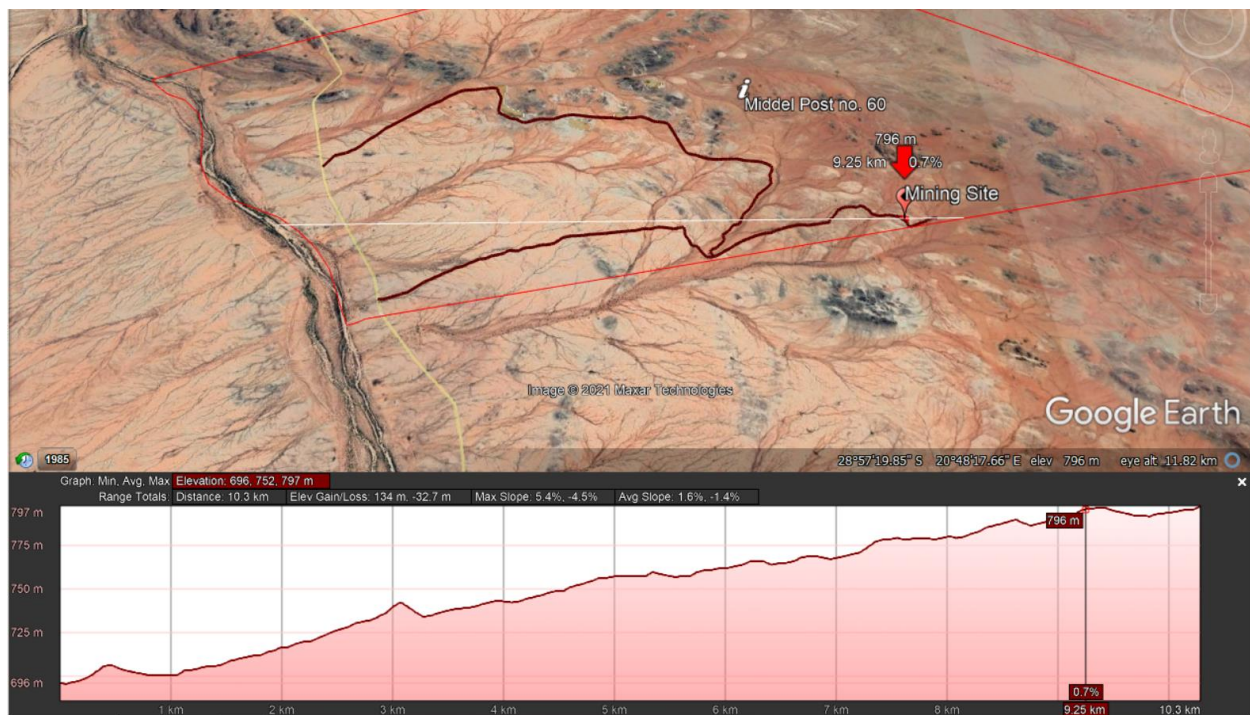


Figure 3 : Elevation profile of the farm Middel Post no. 60, crossing the proposed mining site (Google Earth, 2021).

1) Baseline environment

(a) Type of environment affected by the proposed activity.

(Its current geographical, physical, biological, socio-economic character)

Farm Name	Landowner	Extent
Farm Middel Post no. 60	Stephanus Jesaja Lerm	1.1ha

The receiving environment to which this application relates can be described as Geologically uniform area with limited to no variation in the overall site geology. The area falls within a low rainfall and arid sector. Vegetation falls within the Nama-Karoo Biome and has several vegetation species of importance, however for this site the vegetation is very insignificant since the target area is a rocky outcrop with little to no vegetation. The receiving environment is more broadly discussed in the sections below.

Geology:

The geology of Middel Post no. 60 dates to the Proterozoic era 2500 to 541 million years ago in the Namaqua-Natal Province comprises of highly deformed rocks of medium to high grade metamorphism and is bordering the Archean Kaapvaal Craton to the west, south and east in South Africa. The sector to the west of the Craton, namely the Namaqua Sector, is structurally complex and subdivided from west to east into the Bushmanland Subprovince, the Kakamas and Areachap terranes of the Gordonia Subprovince and the Kheis Subprovince.

The prominent Neusberg Mountain Range, with exposures to the north and south of the Orange River in the Kakamas Terrane constitutes evidence of crustal shortening because of continental collision of the Namaqua Sector block with the Kaapvaal Craton during the Namaquan Orogeny.

The Mesoproterozoic Korannaland Group in the Kakamas Terrane is affected by faulting, folding, and shearing. The Neusspruit Shear Zone is considered as a significant structural feature trending northwest along the Neusberg Mountain Range, which is in the central part of the Kakamas Terrane and comprises of metasedimentary rocks, magmatic rocks in the form of granitic gneisses, and metavolcanic rocks and various rocks affected by contact metamorphism and metasomatism.

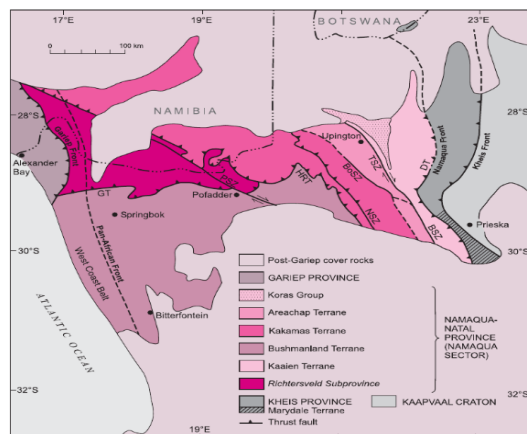


Figure 4 :Geology map of the northern Cape area (A.B.A. Brink 1975).

Soil Classification (natural areas):

Table 5 : The most common soils at the farm Middel Post no. 60 are as follows. (Martin V. Fey,2010).

Differentiating principle	Soil group	Concept	Diagnostic horizon or material for identification
Soils with special subsoil characteristics relating to pedogenic accumulation and having an orthic topsoil	Silicic	Cementation by amorphous silica or sepiolite; arid climate	Dorbank (duripan) or sepiocrete
	Calcic	Carbonate or gypsum enrichment; arid climate	Soft or hardpan carbonate or Gypsic B
	Oxidic	Residual iron enrichment through weathering; uniform colour	Red Apedal, yellow brown Apedal or red structured B
Young soils with an orthic topsoil but weakly developed subsoil	Cumulic	Incipient soil formation in colluvial, alluvial or aeolian sediment	Neocutanic or Neocarbonate B, Regic sand, thick E horizon or stratified alluvium
	Lithic	Incipient soil formation on weathering rock or saprolite	Lithocutanic B or hard rock

Climate:

Regional Climatology and Rainfall

According to meteorological statistics from the South African Weather Services (Weather Bureau) the area has an average annual rainfall of approximately 140 mm and 250 mm per annum (from 1992 up to 2015). This is also depicted in Figure 5. The site falls within the semi-arid Bushmanland region and, as seen in Figure 5, the area receives rain very late in the summer (from March to May). The area receives a maximum of 4 days rain per month, see Figure 5.

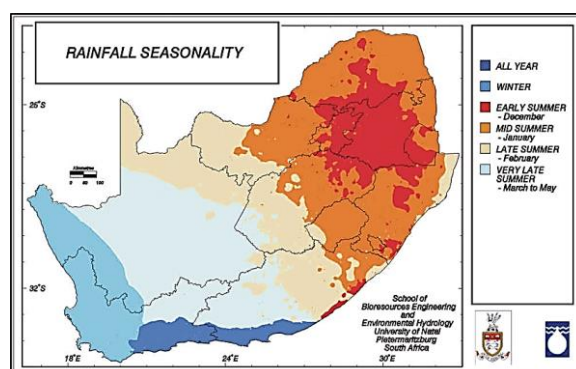


Figure 5 : Seasonal rainfall distribution in South Africa (Schulze and Maharaj, 2006).

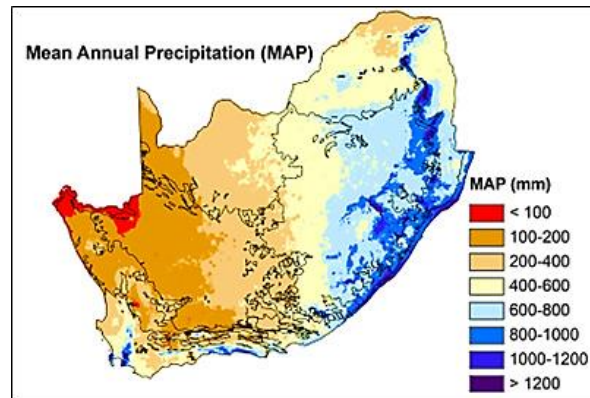


Figure 6 : Mean annual precipitation in South Africa (K. Wessels et al., 2011).

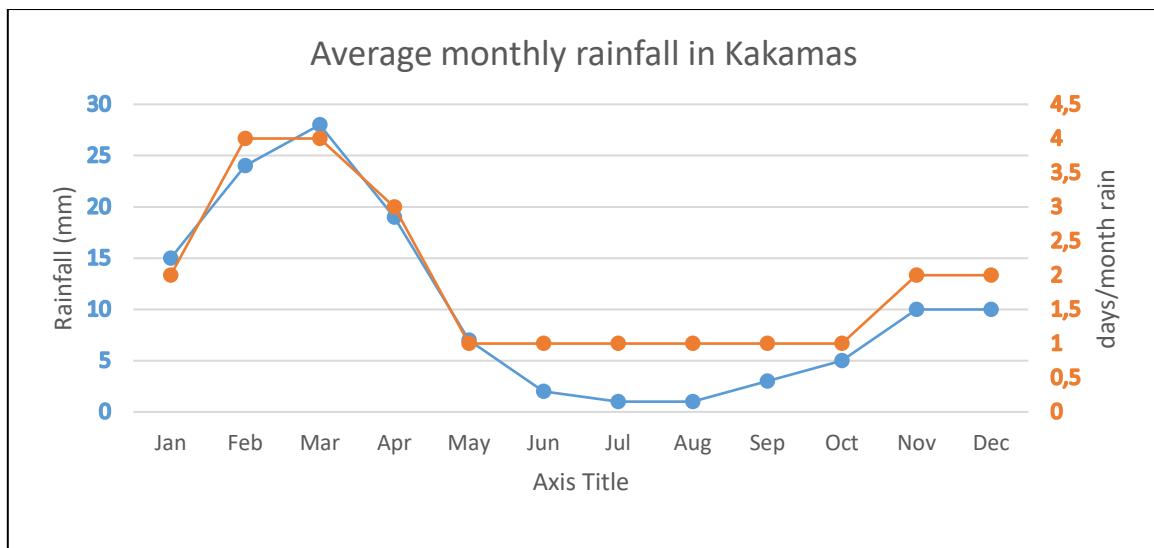


Figure 7 : Average monthly rainfall and days of rainfall per month, in Kakamas (Weather2visit: <https://www.weather2visit.com/africa/south-africa/kakamas.htm>).

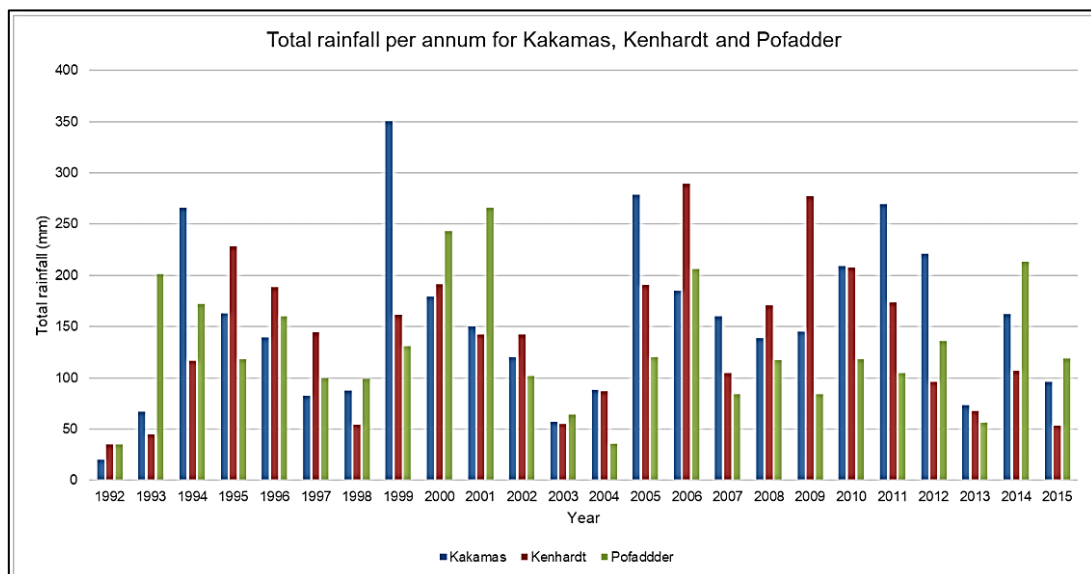


Figure 8 : Total annual rainfall for Kakamas, Kenhardt and Pofadder, from 1992 to 2015 (Weather Bureau of South Africa).

Temperature

The average daily maximum temperature for the area ranges from around 20°C in the winter to 36°C in the summer, see Figure 9. The average daily minimum ranges from around 3°C in winter to 20°C in summer. The variation in temperature from winter to summer is quite significant.

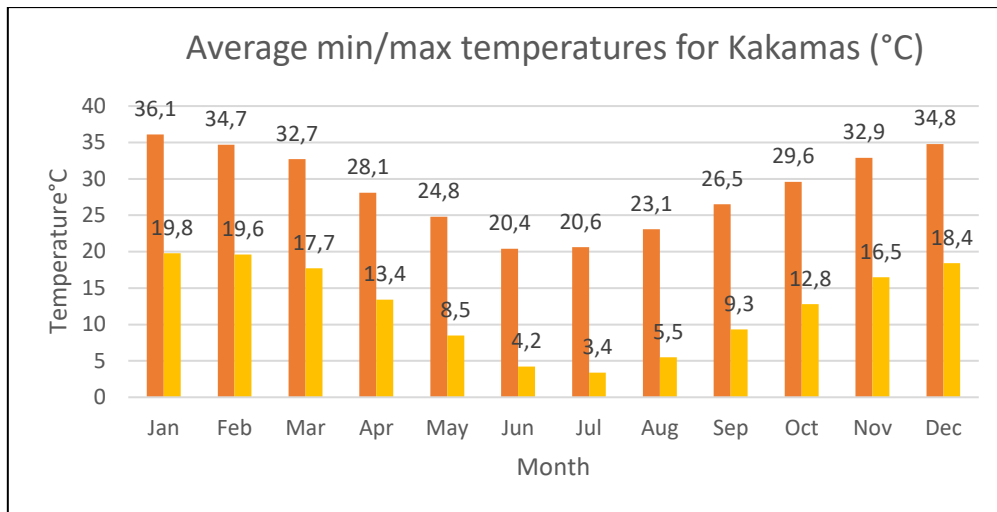


Figure 9 : Average Minimum and Maximum temperatures for Kakamas (°C) (Weather2visit, 2021).

Monthly average, max wind speed and Gust (kmph)

According to World weather online the Average/Max windspeed and gust are on its highest between the months of September and November and on its lowest between the months of April to June. See figure 10 below:

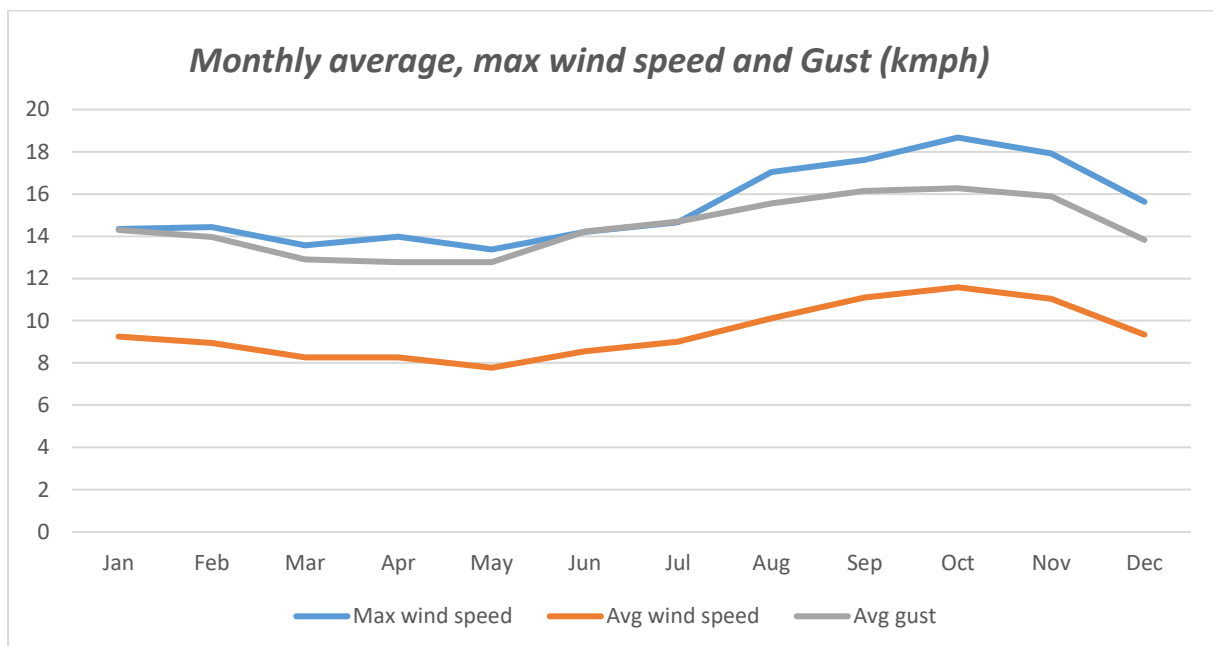


Figure 10 : The past 10 years of Monthly average, max wind speed and Gust in kilometers perhour.(<https://www.worldweatheronline.com/kakamas-weather-history/northern-cape/za.aspx>)

Mean monthly evaporation and frost days

According to Figure 11 the mean annual evaporation potential, for the region to which the application relates, is 2771 mm per annum, experiencing between 21 and 30 mean frost days per annum.

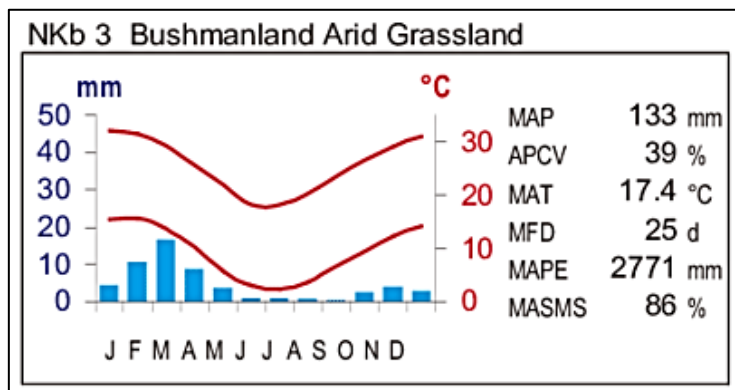


Figure 11 : Mean annual evaporation potential (MAPE) of the area to which the application relates (Mucina and Rutherford, 2006).

Vegetation (Flora):

The proposed site falls within the Nama-Karoo (NK) Biome in South Africa (See Figure). The NK Biome is known for its dry/ arid conditions and has very unpredictable rainfall. This along with several other factors such as very low temperatures, in the winter months, and soils that are generally quite shallow, influence the vegetation that is dominant in the area. The area predominantly has grass that is sustained by aeolian sands, regardless of the amount of rainfall throughout the year.

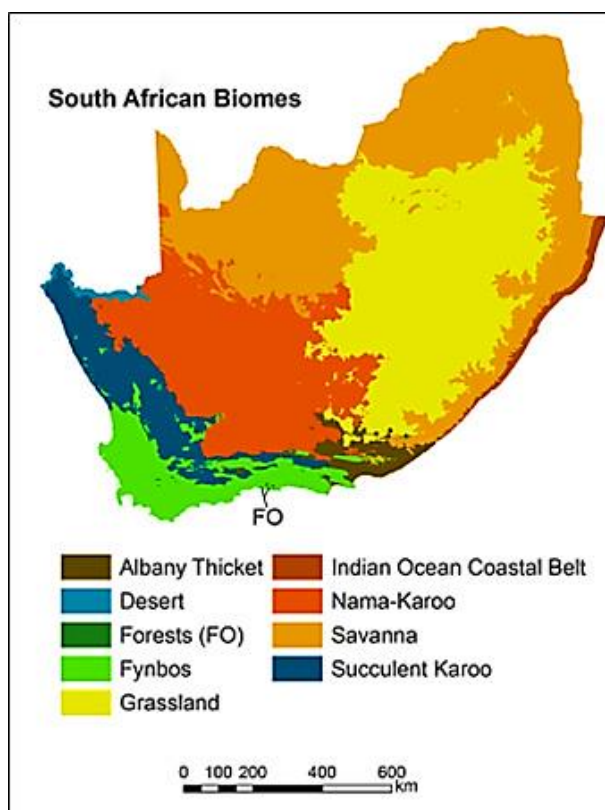


Figure 12 : Biomes of South Africa (K. Wessels et al., 2011).

Inside the Nama-Karoo Biome, several vegetation units exist. The study area forms part of the unit known as Bushmanland Arid Grassland more formally known as NKb3 (See Figure_). According to Mucina *et al.*, this unit can be found between the small towns of Aggeneys, Pofadder, Prieska, and all the way up to Upington.

Dominant species

Between the undulating plains of this vegetation unit a few species are considered predominant, however still sparse. These species include: *Stipagrostis* species (White grass), *Salsola* (Low shrubs), and in years of ample rainfall annual herbs can be expected.

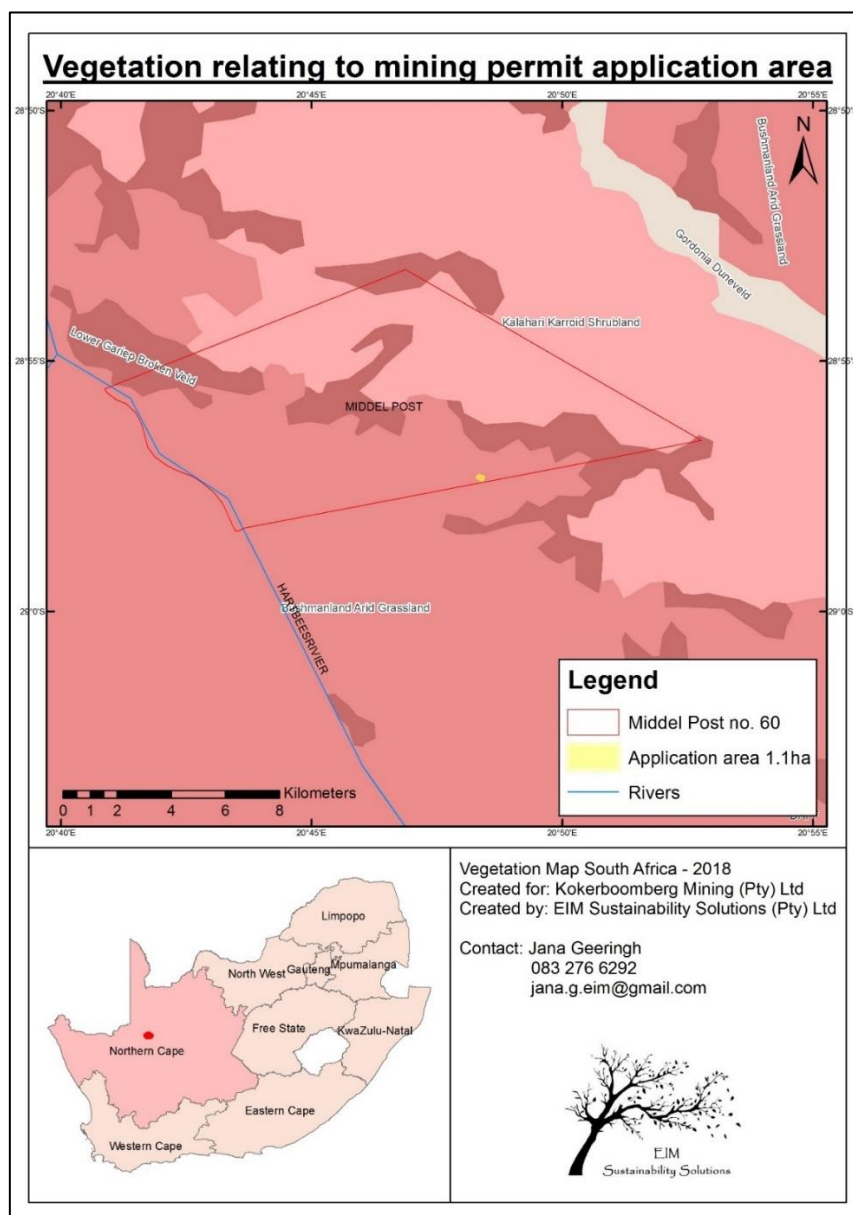


Figure 13 : vegetation relating mining permit application area

Table 6 : Vegetation of the area

Region	Classification	Species
Western and Eastern regions of the unit only	Graminoids (Grass like flora)	<i>Aristida adscensionis</i>
		<i>A. congesta</i>
		<i>Enneapogon desvauxii</i>
		<i>Eragrostis nindensis</i>
		<i>Schmidtia kalahariensis</i>
		<i>Stipagrostis ciliata</i>
		<i>S. obtusa</i>
		<i>Cenchrus ciliaris</i>
		<i>Enneapogon scaber</i>
		<i>Eragrostis annulata</i>
		<i>E. porosa</i>
		<i>E. procumbens</i>
		<i>Panicum lanipes</i>
		<i>Setaria verticillata</i>
		<i>Sporobolus nervosus</i>
		<i>Stipagrostis brevifolia</i> W
		<i>S. uniplumis</i>
		<i>Tragus berteronianus</i>
		<i>T. racemosus</i>
	Small Trees	<i>Acacia mellifera</i> subsp. <i>detinens</i>
		<i>Boscia foetida</i> subsp. <i>foetida</i>
	Tall Shrubs	<i>Lycium cinereum</i>
		<i>Rhigozum trichotomum</i>
		<i>Cadaba aphylla</i>
		<i>Parkinsonia africana</i>
	Low Shrubs	<i>Aptosimum spinescens</i>
		<i>Hermannia spinosa</i>
		<i>Pentzia spinescens</i>
		<i>Aizoon asbestinum</i>
		<i>A. schellenbergii</i>
		<i>Aptosimum elongatum</i>
		<i>A. lineare</i>
		<i>A. marlothii</i>
		<i>Barleria rigida</i>
		<i>Berkheya annectens</i>
		<i>Blepharis mitrata</i>
		<i>Eriocephalus ambiguus</i>
		<i>E. spinescens</i>
		<i>Limeum aethiopicum</i>
		<i>Lophiocarpus polystachyus</i>

		<i>Monechma incanum</i>
		<i>M. spartioides</i>
		<i>Pentzia pinnatisecta</i>
		<i>Phaeoptilum spinosum</i>
		<i>Polygala seminuda</i>
		<i>Pteronia leucoclada</i>
		<i>P. mucronata</i>
		<i>P. sordida</i>
		<i>Rosenia humilis</i>
		<i>Senecio niveus,</i>
		<i>Sericocoma avolans</i>
		<i>Solanum capense</i>
		<i>Talinum arnotii</i>
		<i>Tetragonia arbuscula</i>
		<i>Zygophyllum microphyllum</i>
	Succulent Shrubs	<i>Kleinia longiflora</i>
		<i>Lycium bosciifolium</i>
		<i>Salsola tuberculata</i>
		<i>S. glabrescens</i>
	Herbs	<i>Acanthopsis hoffmannseggiana</i>
		<i>Aizoon canariense</i>
		<i>Amaranthus praetermissus</i>
		<i>Barleria lichtensteiniana</i>
		<i>Chamaesyce inaequilatera</i>
		<i>Dicoma capensis</i>
		<i>Indigastrium argyraeum</i>
		<i>Lotononis platycarpa</i>
		<i>Sesamum capense</i>
		<i>Tribulus pterophorus</i>
		<i>T. terrestris</i>
		<i>Vahlia capensis</i>
	Succulent Herbs	<i>Gisekia pharnacioides</i>
		<i>Psilocaulon coriarium</i>
		<i>Trianthema parvifolia</i>
	Geophytic Herbs	<i>Moraea venenata</i>
Biogeographically Important Taxon (Bushmanland endemic)	Succulent Herb	<i>Tridentea dwequensis.</i>
Endemic Taxa	Succulent Shrubs	<i>Dinteranthus pole-evansii</i>
		<i>Larryleachia dinteri</i>
		<i>L. marlothii</i>

		<i>Ruschia kenhardtensis</i>
	Herbs	<i>Lotononis oligocephala</i>
		<i>Nemesia maxii</i>

Exotic or invader species

According to Grain SA these are the top five Invasive plant species (IAP) in the norther cape.

AIP categories

- **Category 1a and 1b:** Must be removed and destroyed immediately.
- **Category 2:** May be grown if a permit is obtained and the landowner ensures that the invasive species do not spread beyond his/ her property.
- **Category 3:** May not be planted.

Kind of plant (Botanical name)	Common name	Catergory
<i>Opuntia robusta</i>	Blue-leaf cactus	1a
<i>Ricinus communis</i>	Castor - oil plant	2
<i>Tamarix chinensis</i> <i>Lour</i>	Chinese tamarisk	1b
<i>Datura stramonium</i> <i>L</i>	Common thorn apple	1b
<i>Arundo donax L</i>	Giant reed	1b

Animal Life (Fauna):

According to the Mammals guid of south Africa Writing by Burger Cille these are the Fauna of the mining site area.

Table 7 : Animal Life

Classification (family name)	Species
Ungulates	<i>Antidorcas marsupialis</i>
	<i>Oryx gazella</i>
	<i>Oreotragus oreotragus</i>
	<i>Raphicerus campestris</i>
	<i>Sylvicapra grimmia</i>
Feline	<i>Panthera pardus</i>
	<i>Caracal caracal</i>
	<i>Felis silvestris lybica</i>
	<i>Felis nigripes</i>
Hyaenidae	<i>Parahyeana brunnea</i>
	<i>Proteles cristatus</i>
Canidae	<i>Canis mesomelas</i>

	<i>Otocyon meaglotis</i>
	<i>Vulpes chama</i>
Mustelidae	<i>Mellivore capensis</i>
	<i>Ictonyx striatus</i>
	<i>Aonyx capensis</i>
Viverridae	<i>Genetta genetta</i>
Herpestidae	<i>Cynictus penicillate</i>
	<i>Galerella sanguinea</i>
	<i>Galerella flavescens</i>
	<i>Galerella pulverolenta</i>
	<i>Suricata suricatta</i>
Orycteropodidae	<i>Orycteropus afer</i>
Manidae	<i>Manis temminckii</i>
Procaviidae	<i>Procavia capensis</i>
Hystriidae	<i>Hystrix africaeaustralis</i>
Leporidae	<i>Lepus saxatilis</i>
	<i>Lepus capensis</i>
	<i>Pronolagus randensis</i>
Sciuridae	<i>Xerus inauris</i>
Cercopithecidae	<i>Papio hamadryas ursinus</i>
Molossidae	<i>Tadarida aegyptiaca</i>
Nycteridae	<i>Nycteris thebaica</i>
Vespertilionidae	<i>Neoromicia capensis</i>
Bathyergidae	<i>Cryptomys hottentotus</i>
	<i>Parotomys brantsii</i>
	<i>Rhabdomys</i>
	<i>Thallomys peadulcus</i>
	<i>Aethomys namaquensis</i>
	<i>Tatere leucogaster</i>
	<i>Saccostomus campestris</i>

Socio-Economic Character

Population density

Kakamas is the highest populated area close to the Mining site which is situated approximately 34km Northwest of the Mining site. The estimated population according to Stats SA is approximately 9,538, with the population density equal to 2098 persons/km². (www.statssa.gov.za)

Language distribution

The language distribution of Kakamas is as follows. Afrikaans is the common language at 93.50% followed by Setswana (2.30%), English (1.60%) and IsiXhosa (0.70%). The Figure 14 below indicates the language distribution of Kakamas in percentages.

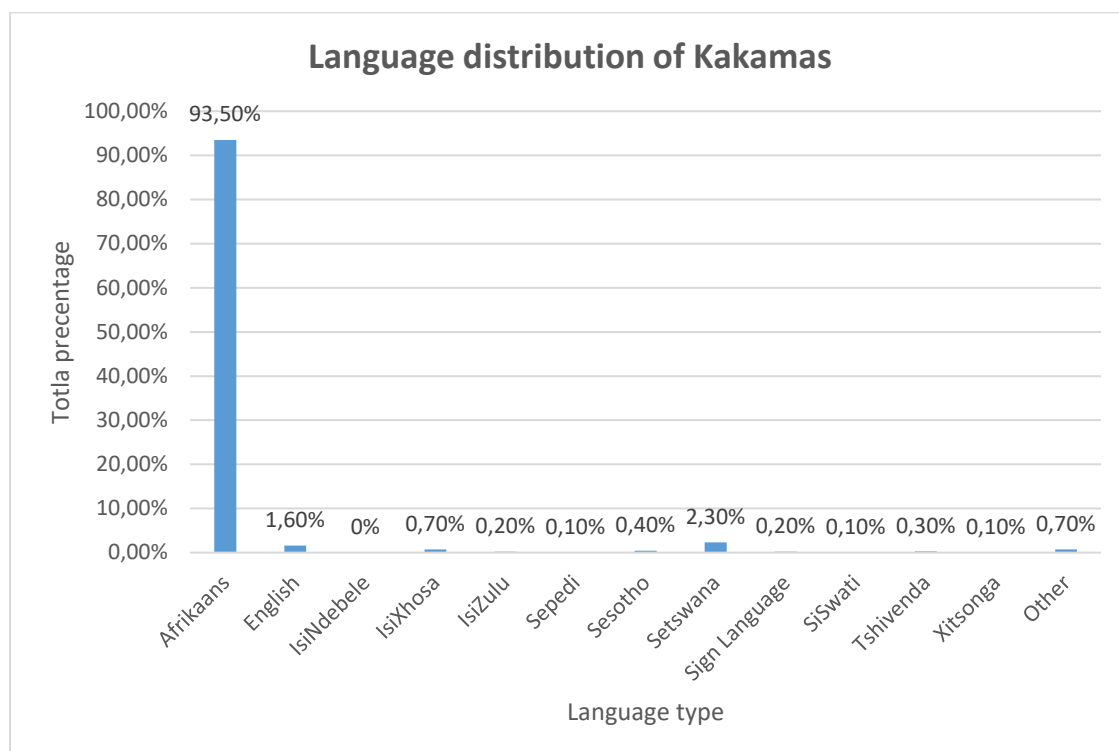


Figure 14 : The language distribution of Kakamas. (www.statssa.gov.za).

Economic activities

Kakamas' economy is primarily based on agriculture. Because of the irrigation provided by the Orange River, the farmers of Kakamas have become major exporters of table grapes to Europe and England. Kakamas farmers also produce dried fruit, raisins, oranges, and dates that are exported locally and internationally.

Housing

The number of households found within Kakamas area equates to 2,164 with an average household size of 4.3. The living conditions in these houses are as follows, a total 99.4% of the households have flush toilets where 87.6% are connected to the sewerage system and the other 11.6% are connected to a septic tank. The remaining 0.6% have no access to flush toilets. Most households have and use electronic devices such as televisions and radios as the Figure 15 below indicates. (www.statssa.gov.za)

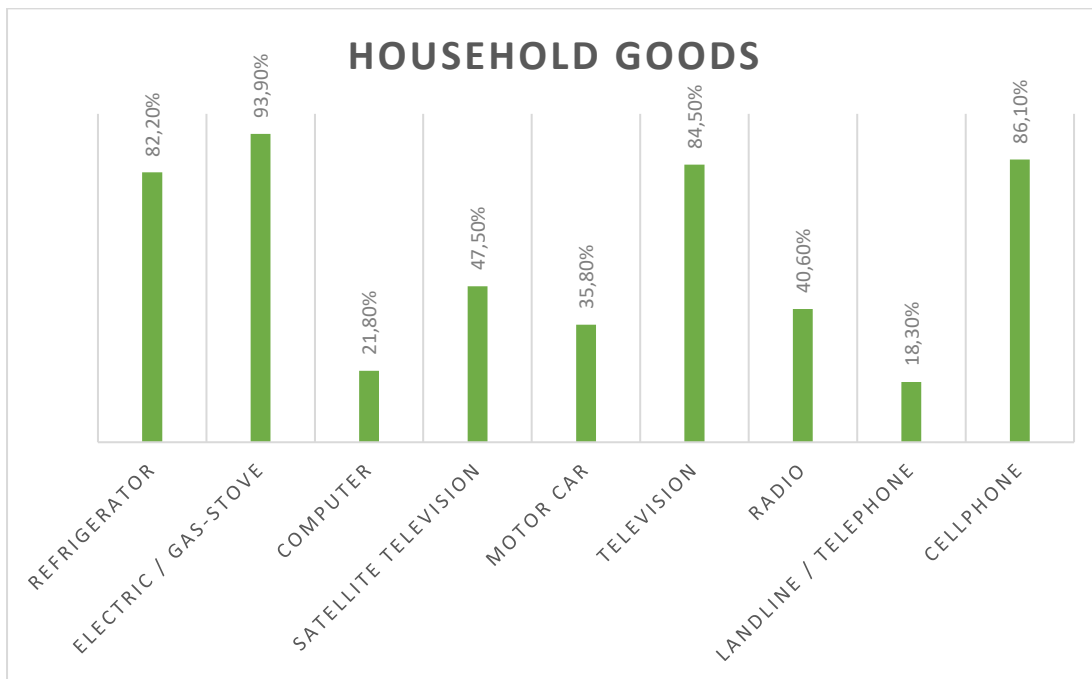


Figure 15 : Household goods of Kakamas town. (www.statssa.gov.za)

Unemployment

The unemployment rate for the Northern Cape, Kai! Garib and Kakamas is 26%, 15% and 22% respectively. (www.statssa.gov.za)

Household income

Figure 16 indicates the average Household income of Kakamas. 6.70 % of people in the working-age group (15-64 years old) have no income. 21.50% of people in the Kakamas area have incomes ranging from R38.201 - R76400. The figure below shows the average household income. (www.statssa.gov.za)

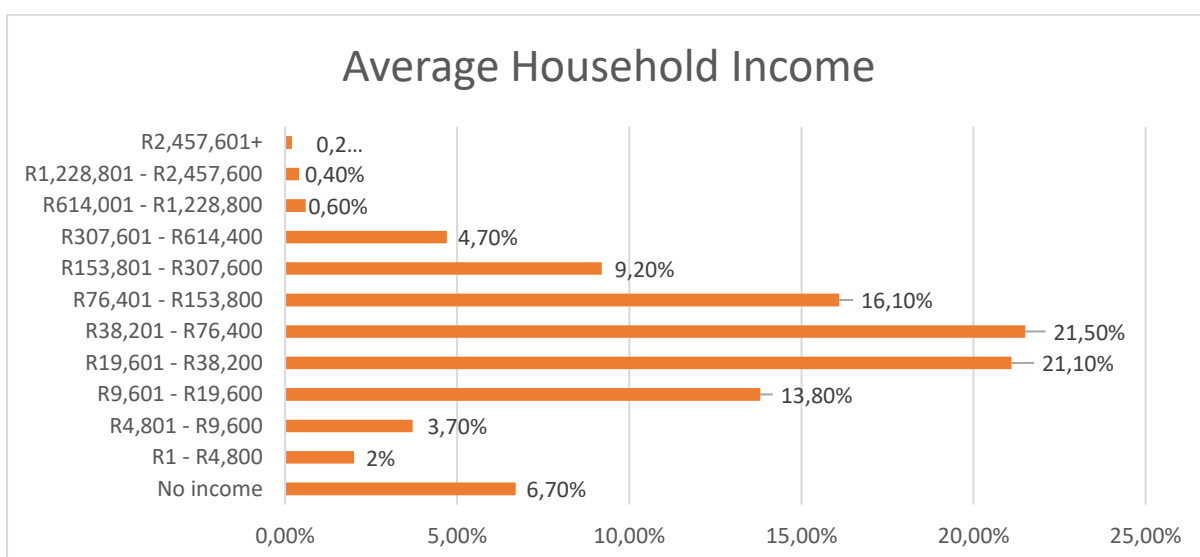


Figure 16 : Average Household Income of Kakamas town. (www.statssa.gov.za)

Social infrastructure

Kakamas local municipality supports sufficient infrastructure for the larger community of the area. The area hosts several businesses, churches, schools, clinics and other community structures.

Water supply

The Kai Garib local municipality supplies 96.40% of water to Kakamas through the local/regional water scheme. The rest of the households use other methods such as boreholes and water tanks. See figure 17 below. (www.statssa.gov.za)

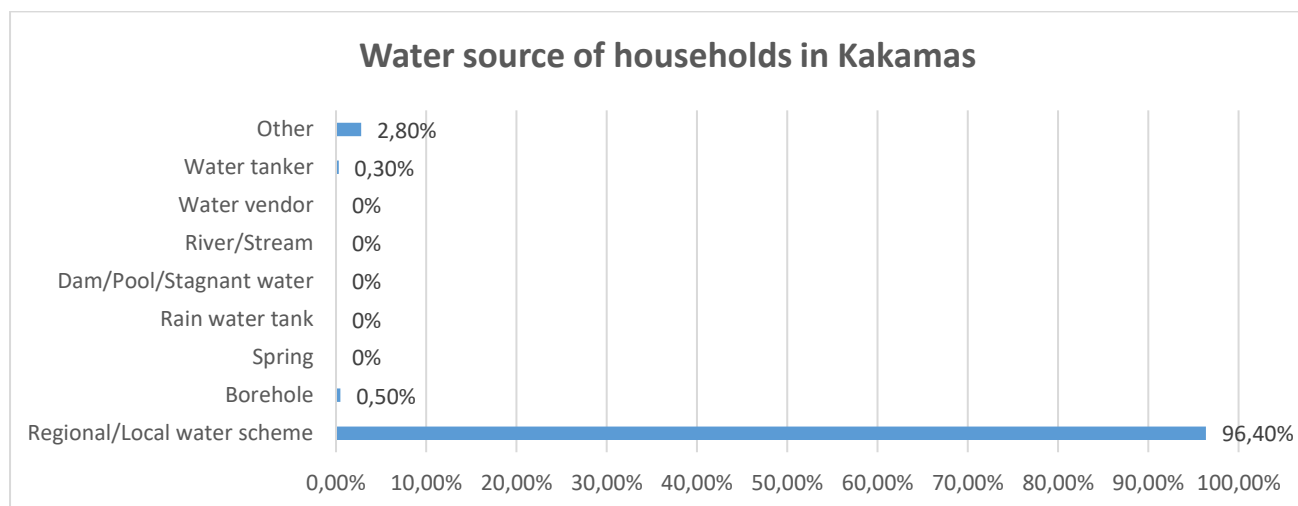


Figure 17 : Water source of households in Kakamas. (www.statssa.gov.za)

Power supply

Kai Garib local municipality and Kakamas town receive power from Eskom. Electricity is the primary energy source, followed by wood and gas. The graph below shows much energy is used for cooking, heating, and lighting (in percentages). (www.statssa.gov.za)

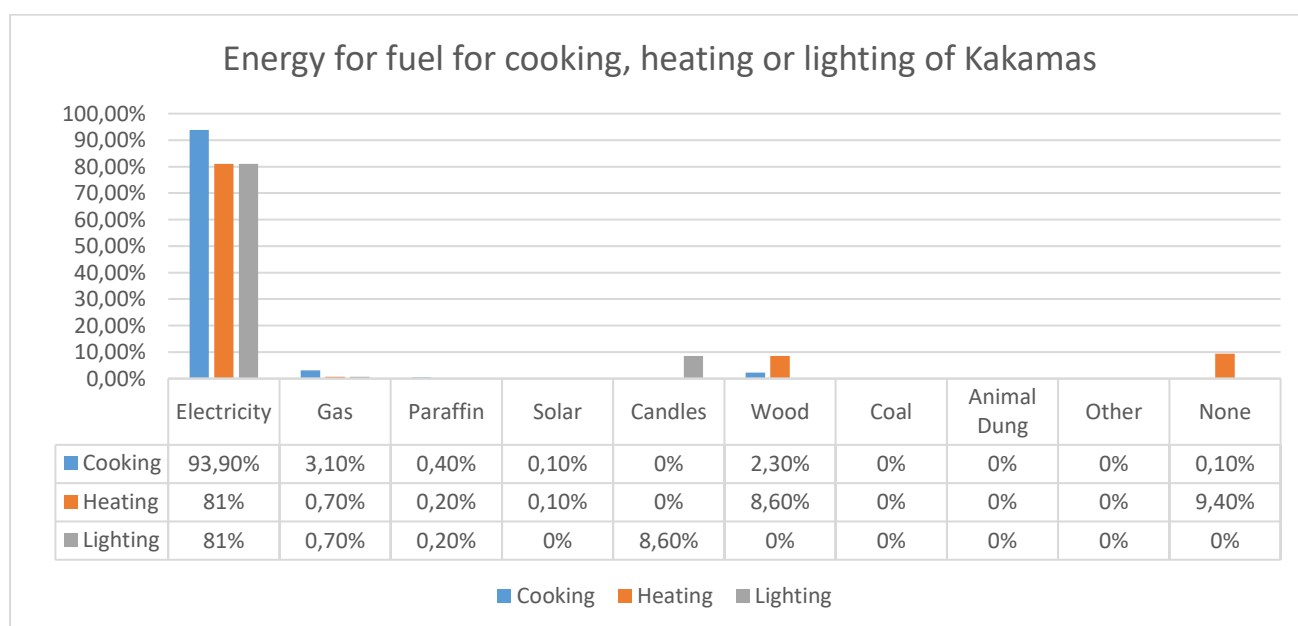


Figure 18 : Energy or fuel for cooking, heating or lighting (www.statssa.gov.za).

(b) Description of the current land uses.

Current land use zoning: Intensive Agriculture

See Appendix G - Sensitivity Maps.

The surrounding land use is primarily agricultural and mining. A regional dirt road runs to the west of the farm Middel Post no. 60.

(c) Description of specific environmental features and infrastructure on the site.

The infrastructure of the site will be limited to non-permanent structures such as portable toilets. No additional infrastructure will be needed on site.

(d) Environmental and current land use map.

(Show all environmental and current land use features)

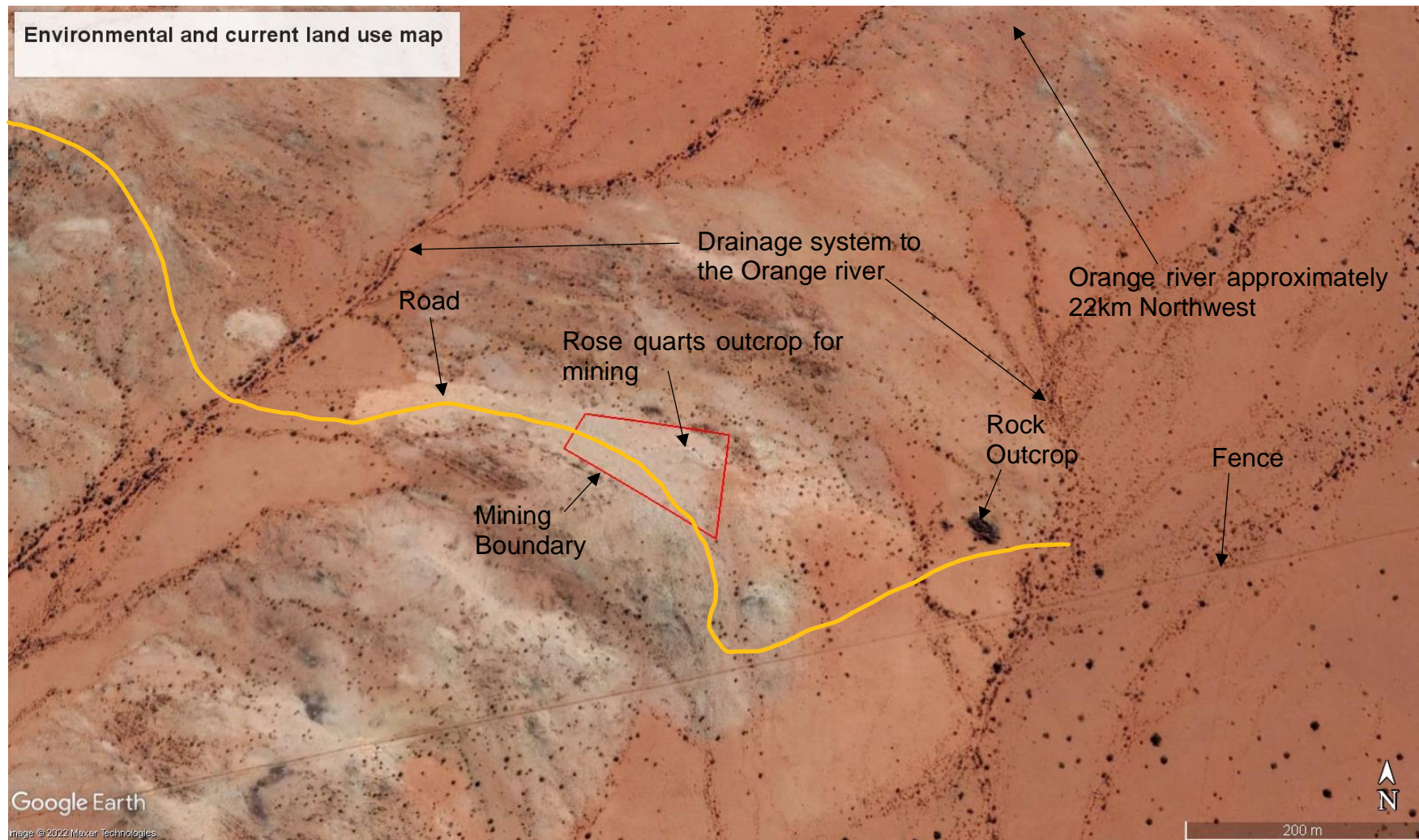
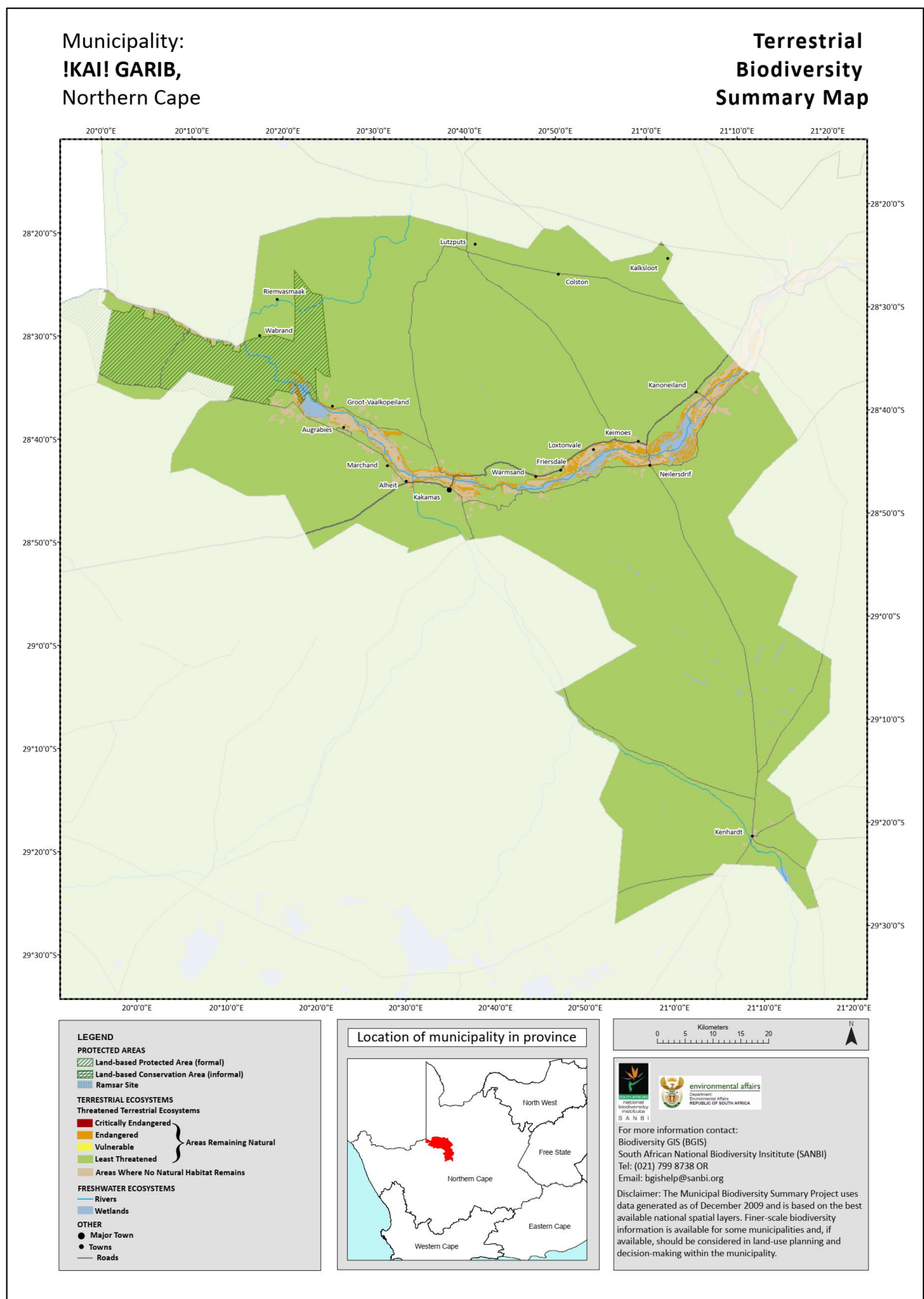


Figure 19 : above depicts the environmental sensitivity (SANBI) and land use map of the site as well as the surrounding areas. Also see Appendix D.

Figure 20 : Environmental sensitivity and land use map



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

(Provide a list of potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typically known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of impacts. Indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated)

Table 8: Potential Impacts of activities to be undertaken and the potential consequences of these impacts.

POTENTIAL IMPACT CAUSED BY ACTIVITIES	NATURE	SIGNIFICANCE	PROBABILITY	DURATION	EXTENT	Degree to which impacts can			SUBTOTAL	MAGNITUDE	TOTAL SCORE	TOTAL IMPACT SCORE	CONSEQUENCES OF ACTIVITIES
						Cause irreplaceable damage/ loss	Be reversed	Be avoided, mitigated, managed					
Impact on Geology as result of the extraction of the minerals applied for during the mining process													
Loss of geological resources/ reserves (due to Core Drilling)	Negative	1	5	5	1	0	-2	-4	6	1	6	Insignificant	No significant consequence
Impact on the Topography and Geomorphology as result of mining and related activities													
Changes to the topography (Natural and artificial surface features)	Negative	1	2	1	1	2	-3	-3	1	2	2	Insignificant	Degradation of sense of place & destruction of habitats, loss of biodiversity in the area.
Changes in geomorphology (Natural land forms)	Negative	1	2	1	1	2	-3	-3	1	2	2	Insignificant	
Impact on Soil as result of site clearing and mining													
Loss of soil structure	Negative	3	4	3	1	1	-3	-2	7	3	21	Low	Decrease in soil fertility, diminishing opportunities for alternative or future
Loss of soil nutrients	Negative	3	4	3	1	1	-3	-2	7	3	21	Low	
Soil compaction	Negative	3	5	3	1	1	-3	-3	7	3	21	Low	

POTENTIAL IMPACT CAUSED BY ACTIVITIES	NATURE	SIGNIFICANCE	PROBABILITY	DURATION	EXTENT	Degree to which impacts can			SUBTOTAL	MAGNITUDE	TOTAL SCORE	TOTAL IMPACT SCORE	CONSEQUENCES OF ACTIVITIES
						Cause irreplaceable damage/ loss	Be reversed	Be avoided, mitigated, managed					
Soil contamination	Negative	5	2	2	1	2	-3	-3	6	3	24	Low	land uses (low key grazing).
Soil erosion	Negative	3	3	4	1	3	-3	-1	7	3	33	Low	
Impact on natural vegetation as result of site clearing, mining and related activities													
Loss of vegetation and habitat within the development footprint.	Negative	1	1	4	1	1	-2	-4	2	3	6	Insignificant	Cumulative loss of indigenous vegetation, biodiversity, habitat, change in soil fertility and restrictions to other land use.
Potential invasion of invader plants	Negative	4	4	2	1	1	-3	-4	5	3	15	Low	
Loss of floral Red Data Species (Marula Trees/ Hardekool))	Negative	1	1	4	1	1	-2	-4	2	3	6	Insignificant	
Loss of floral diversity	Negative	1	1	4	1	1	-2	-4	2	3	6	Insignificant	
Loss of floral habitat	Negative	1	1	4	1	2	-2	-4	3	3	9	Insignificant	
Impact on wild life as result of site clearing, mining and related activities													
Hunting & trapping of wild animals	Negative	4	4	4	2	3	-2	-2	13	3	39	Moderate	Loss of faunal SCC Loss of faunal habitat and faunal diversity Decrease in faunal diversity
Loss of wild or domestic animals on access and haul roads.	Negative	3	3	1	2	2	-3	-4	4	3	12	Low	
Loss of wildlife diversity	Negative	3	3	1	2	2	-3	-4	4	3	12	Low	
Loss of faunal SCC	Negative	3	3	4	2	2	-2	-3	9	3	27	Low	

[illegible]

POTENTIAL IMPACT CAUSED BY ACTIVITIES	NATURE	SIGNIFICANCE	PROBABILITY	DURATION	EXTENT	Degree to which impacts can			SUBTOTAL	MAGNITUDE	TOTAL SCORE	TOTAL IMPACT SCORE	CONSEQUENCES OF ACTIVITIES
						Cause irreplaceable damage/ loss	Be reversed	Be avoided, mitigated, managed					
(No wetlands have been identified)													
Impact on ground water as result of site clearing, mining and related activities													
Ground water contamination	Negative	5	2	4	1	2	-2	-2	10	3	30	Low	A decrease in ground water quality and quantity may affect the site and surrounding agricultural & village areas.
Changes in ground water quantity. Note: Groundwater will not be required	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Impact on air quality as result of site clearing, mining and related activities													
Dust exposure levels during drilling activities	Negative	3	5	2	2	1	-4	-3	6	3	18	Low	Health-related issues in surrounding communities and workers.
Air quality -Airborne contaminants other than dust	Negative	3	5	2	2	1	-3	-1	9	3	27	Low	
Impact on ambient noise levels as result of site clearing, mining and related activities													
Ambient Noise levels during the drilling phase	Negative	3	5	3	2	1	-3	-1	10	3	30	Low	Decrease in faunal diversity and esthetical impacts to neighbours
Impact on Archaeological, cultural and heritage resources as result of site clearing, mining and related activities													
Destruction or damage to archaeological sites or artefacts	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Damage to cultural/ historical resources/ artefacts

[illegible]

POTENTIAL IMPACT CAUSED BY ACTIVITIES	NATURE	SIGNIFICANCE	PROBABILITY	DURATION	EXTENT	Degree to which impacts can			SUBTOTAL	MAGNITUDE	TOTAL SCORE	TOTAL IMPACT SCORE	CONSEQUENCES OF ACTIVITIES
						Cause irreplaceable damage/ loss	Be reversed	Be avoided, mitigated, managed					
Loss of land for other purposes (i.e., expansion of community activities or ecotourism)	Negative	5	2	2	2	1	-4	-4	2	3	6	Insignificant	Loss in 'sense of place' & decrease in land use diversity and biodiversity.
Impacts on Land Capability (suitability of various types of soils for economic uses) as result of site clearing, mining and related activities													
Decrease in land capability and viability for future land uses.	Negative	5	2	2	2	1	-4	-4	2	3	6	Insignificant	Loss in 'sense of place' and a decrease in land use diversity and biodiversity.
Loss of land for other purposes (i.e., expansion of community activities or ecotourism)	Negative	5	2	2	2	1	-4	-4	2	3	6	Insignificant	

vi) **Methodology used in determining and ranking the nature, significance, consequence, extent, duration, and probability of the potential environmental impacts and risks;**

Mining and related activities identified in the document are used as a basis to identify impacts occurring concerning each of the aspects identified. Under each aspect identified, a table summarises the impact rating as well as a description as to how these aspects are impacted upon during the mining operational phases, decommissioning and post-closure phases. Several impact ratings are based on the fact that the designated area earmarked for exploration has already been transformed by preceding mining activities.

According to the Environmental Impact Assessment Regulations of 2014, a **significant impact is defined as: "an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.**

As a result, each potential impact of this mining development is assessed according to their extent, duration, intensity, probability of occurrence, significance and their nature by use of the following scales”:

Nature of the impact:

Positive: Impact will be beneficial to the environment.

Negative: Impact will not be beneficial to the environment.

Significance of the impact:

This is a subjective indication of the **importance** of the **unmitigated impact** in terms of the intensity of the impact as well as the degree of environmental damage caused by the impact (in %).

1 = Minor: Impact is of low significance due to the minor intensity of the impact and will have a less than 20% chance of causing damage to the biophysical and anthropogenic aspects.

2 = Low: Impact is of low intensity and has a chance of between 20% – 40% to cause damage to the biophysical/anthropogenic aspects.

3 = Moderate: An impact with a moderate intensity has a 40 – 60% chance of causing damage to the biophysical/anthropogenic aspects.

4 = Significant: An impact with a significant intensity has a 60 – 80% chance of causing damage to the biophysical/anthropogenic aspects.

5 = Severe: An impact with a severe intensity has a chance of more than 80% to cause damage to the biophysical/anthropogenic aspects.

The probability of the impact:

This is the subjective assessment of the likelihood of an impact but can be based on precedents from similar mining operations or mining methods.

1 = Unlikely: Uncertainty or slight risk of impact occurring.

2 = Possible: Reasonable expectancy of an impact based on similar operations or sensitivity of the environment

3 = Probable: Stronger likelihood or risk of a specific impact given the environmental context.

4 = Highly likely: Impact is highly likely to occur.

5 = Definite: Impact will definitely occur if the activities are implemented.

Duration of impact:

1 = Short: Will only have an effect during the construction phase. A value of 1 is allocated to impacts with a short duration.

2 = Short-Medium: Effect will last for a period of up to 5 years. A value of 2 is allocated to impacts with a short-medium duration.

3 = Medium: Effect continues at any point for a period of between 5 and 15 years. A value of 3 is allocated to impacts with a medium duration.

4 = Long: Impact will last for the entire operational period but will be mitigated by human intervention or natural processes thereafter. A value of 4 is allocated to impacts with a long duration.

5 = Permanent: Non-transitory impacts that cannot be mitigated by man or natural processes. A value of 5 is allocated to impacts with a permanent duration.

Extent of impact:

1 = Site: Impact affects the whole, or measurable part of the mining area. A value of 1 is allocated to impacts of which the extent does not exceed that of the site.

2 = Local: Site and immediate surrounds, adjacent households/village Sub Regional geographic area or municipal scale. A value of 2 is allocated to impacts which extend to the local area.

3 = Regional: provincial scale or impacts across provincial borders. A value of 3 is allocated to impacts which extend to the regional area.

4 = National: Direct and indirect impacts affecting environmental elements on a National level (South Africa). A value of 4 is allocated to impacts which extend to the national level.

5 = International: Neighbouring countries with respect to shared borders or resources. A value of 5 is allocated to impacts which extend to the international borders.

DEGREE TO WHICH POTENTIAL IMPACTS CAN:

Cause irreplaceable (permanent) loss or damage to the natural and/or human environment:

0 = Impossible: There is a zero % chance that the impact will cause damage or permanent loss to the natural and/or human environment.

1 = Unlikely: There is a less 25% chance that the impacts will cause irreplaceable loss or damage to the natural/human environment or resources.

2 = Possible: Stronger likelihood 50% sure of a particular fact) of a specific impact causing irreplaceable loss or damage to the environment.

3 = Highly likely: There is a 75% chance that this impact could cause permanent loss/damage to the natural/human environment.

4 = Definite: Impact will definitely (100% certain) cause irreplaceable loss or damage to the natural/human environment.

¹Be reversed (upon cessation of an individual - or all activities):

0 = Irreversible: The impact cannot be reversed regardless of whether rehabilitation/mitigation takes place. The impact and damage to the environment therefore are permanent. There is thus a 0% probability that the impact can be reversed.

-1 = Unlikely: There is a 25% probability that the impact can be reversed through rehabilitation and mitigation measures.

-2 = Possible: There is a 50% probability that the impact can be reversed through mitigation and rehabilitation.

-3 = Highly likely: There is a 75% probability that the impact and damage caused by the activities on the environment are reversible.

-4 = Reversible: Impact and damage caused by the activities on the environment can be completely reversed and restored so that the post-mining environment resembles the pre-mining environment.

²Be avoided/mitigated/managed (during or upon cessation of and individual- or all activities):

0 = Unavoidable: Impact cannot be avoided, mitigated and/or managed at all if the proposed activities are to take place.

-1 = Unlikely: Impact is unlikely (25%) to be avoided, however the impact can be mitigated and/or managed to lower its significance.

-2 = Possible: The impact can possibly (50%) be avoided through proposed mitigation and/or management strategies.

¹ Note that the degree to which an impact can be reversed lowers the severity of the impact and is therefore not added to the subtotal but subtracted.

² Note that the degree to which an impact can be avoided, mitigated or managed lowers the severity of the impact and is therefore not added to the subtotal but subtracted.

-3 = Highly likely: The impact can mostly (75%) be avoided through proposed mitigation and/or management strategies.

-4 = Definitely avoidable: The impact can be completely (100%) avoided through proposed mitigation and/or management strategies.

Ranking and determining the overall significance of the impact:

Each aspect (duration, probability etc.) within the impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it is necessary to rank all criteria. This is achieved by means of allocating a magnitude value to each of the respective impacts.

The Magnitude of the impact is determined as follows:

1 = Minor: Impact would be negligible, as no mitigation / remedial actions would be required. Any minor mitigation measures which might be required would be inexpensive and easily achievable.

2 = Low: Impact would be low in ranking with little actual effect on the environment. In relation to negative impacts, mitigation/remedial actions would be either easily achieved or would require minimal remedial actions.

3 = Moderate: Impact is a reality but not significant when measured against the extreme. Mitigation/remedial actions are possible and practical.

4 = Significant: Impacts are of significant ranking. Mitigation and/or remedial actions are achievable but are challenging, costly, time-consuming or a combination of these.

5 = Severe: Of the highest ranking possible within the ranking perimeters of the impact which could occur. There would be no possible mitigation or remedial actions to counteract the impact in its geographical setting and predicted time scales.

The total score of each impact is calculated by adding the ranked values of each aspect of a given impact and multiplying this added value with the Magnitude of the impact. Note that the degree to which the impact can be reversed as well as the degree to which the impact can be avoided, mitigated and managed, will not be added to the overall impact score, but rather subtracted since it does not decrease add to the severity of the impact but instead decreases it.

Total impact score = (Duration + Probability + Significance + Extent + Degree to which the impact can be cause irreplaceable loss - degree to which the impact can be reversed - degree to which the impact can be mitigated) x Magnitude.

The total impact score will then be determined from the value of the total score. If the total score is between **1 and 11**, the impact is regarded as **minor/insignificant**. Where the total score is between **12 and 30**, the impact is **low**. If the total score is between **31 and 50**, then the impact is regarded as **moderate**. If the total score is between **51 and 90** the impact is regarded as **significant**. Any impacts with a total score higher than **91** are regarded as **severe**.

These five classes of impact significance (Minor/Insignificant, Low, Moderate, Significant, and Severe) have been calculated in the following manner: The highest total score that an impact can have is 125, which is calculated when each aspect (duration probability etc.) and the Magnitude of that impact is given a value of 5, which would be the worst-case scenario. The degree to which impacts can be reversed and mitigated, managed will be given a value of 0 as a worst-case scenario.

For example: Total score = (Duration:5 + Probability:5 + Significance:5 + Extent:5 + cause loss:5 - reversed:0 - can be avoided:0) x Magnitude:5 = 125.

Since we require 5 classes to describe the total impact value, we divide this maximum value of 125 into 5 classes to create an exponential increase.

The first class (minor/insignificant total score) therefore contains the values of the total score between 1 and 11. The second class (Low) is when the total score results in a value of between 12 and 30. The third class (moderate) is when the total score is between 31 and 50, the fourth class (significant) is when the total score is between 51 and 90, and the fifth class (severe) is when the total score contains a value that falls between 91 and 125. Also refer to **Error! Reference source not found.0**.

The consequence of the impact:

The consequence of each impact is dependent on the nature, significance, extent, probability and duration of the impact which could lead to cumulative impacts. The clearance of vegetation for instance can lead to the cumulative change of land cover, increasing the ³albedo and visual impact of the affected area.

³ Albedo is the fraction of solar energy (shortwave radiation) reflected from the Earth back into space. It is a measure of the reflectivity of the earth's surface. Ice, especially with snow on top of it, has a high albedo: most sunlight hitting the surface bounces back towards space.

Table 9: Ranking, magnitude, and the total score of the given aspects of each impact.

Significance	Probability	Duration	Extent	Degree to which the impact can be:			Magnitude	Total Impact Score
				cause irreplaceable loss or damage	reversed	Can be avoided, mitigated managed		
1 Minor	1 Unlikely	1 Short	1 Site	0 Impossible	0 Irreversible	0 Unavoidable	1 Minor	1 – 11 Minor/Insignificant
2 Low	2 Possible	2 Short-Medium	2 Local	1 Unlikely	-1 Unlikely	-1 Unlikely	2 Low	12 – 30 Low
3 Moderate	3 Probable	3 Medium	3 Regional	2 Possible	-2 Possibly	-2 Possibly	3 Moderate	31 – 50 Moderate
4 Significant	4 Highly Probable	4 Medium - Long	4 National	3 Highly likely	-3 Highly likely	-3 Highly likely	4 Significant	51 – 90 Significant
5 Severe	5 Definite	5 Permanent	5 International	4 Definite	-4 Reversible	-4 Definitely avoidable	5 Severe	91 – 125 Severe

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

See Table 15 under point 1 d (v) which describes the positive and negative impacts of the mining activities.

- viii) The possible mitigation measures that could be applied to concerns raised by the I&AP's and the level of risk.**

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

The Kai!Garib Local Municipality stated that before mining can commence, a rezoning application must be submitted, as the site at the moment is registered as an agriculture site and must be rezoned as a mining site. No other environmental management, social or socio-economic concerns have yet been raised by any affected parties. Due to the low-impact mining activities.

- ix) Motivation where no alternative sites were considered.**

Mining activity is specific to an outcrop that meets the requirements of the mining permit. Thus, no alternative sites have been considered since there are no other outcrop sites in the area. The fact that the mining activities will not be in a natural, undisturbed environment is a sufficient, logical reason to select this site. The applicant is focusing on restricted blasting to avoid or minimize the impact on the natural environment.

- x) Statement motivating the alternative development location within the overall site (Provide a statement motivating the final site layout that is proposed).**

The proposed mining site locations within the property boundary are validated by the fact that a significant part of the planned mining activity will take place on a section of land that has little to no vegetation. Site photographs clearly indicate the absence of vegetation in the target area. Existing and access road leads passed the mining area.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (in respect of the final site layout plan) through the life of the activity.

(Including (1) a description of all environmental issues and risks that are identified during the environmental impact assessment process and (2) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures).

The process undertaken to identify, assess and rank impacts and risks imposed on the preferred site included:

- An initial site assessment by the Environmental Assessment Practitioner
- Desktop studies and site investigations conducted by EIM Sustainability Solutions (Pty) Ltd. that entailed: Fauna, Flora and Climate studies.

Using desktop studies, we determined the impacts and risks concerning the surrounding environment are low and these desktop studies were used to identify, assess, rank, and mitigate impacts.

j) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons and not only those that were raised by registered I&AP's)

Table 10: Significant impacts and risks

NAME OF ACTIVITY (Eg. For Mining – blasting site, site camp, ablution facility, accommodation, equipment, storage, sampling storage, site office etc. For mining – excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) Eg. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, decommissioning, closure, post-closure)	SIGNIFICANCE If not mitigated	MITIGATION TYPE (modify, remedy, control, stop through eg noise control measures, storm water control, dust control, rehabilitation, design measures, blasting control, avoidance, relocation etc. Modify through alternative method. Control through noise control, control through management and monitoring)	SIGNIFICANCE If mitigated
PHASE I: Non – Invasive Mining methods						
Investigate possible sources for historical data & obtain relevant historical data	None identified	N/A	Planning	N/A	No mitigation required	N/A
Data Assessment	None identified	N/A	Planning	N/A	No mitigation required	N/A
Detailed desktop studies	None identified	N/A	Planning	N/A	No mitigation required	N/A
PHASE II: Non – Invasive Mining methods						
Mapping of the surface features to determine joints, faults and economic viability	None identified	N/A	Operational	N/A	No mitigation required	N/A
PHASE III: Invasive Mining methods						
Site Access (to mining that falls within natural, undisturbed areas)	1. Disturbance or destruction of on-site fauna & flora	Loss of biodiversity	Construction Phase	Low	1. The total area of disturbance within natural areas will not exceed 299 square metres.	Insignificant

NAME OF ACTIVITY (Eg. For Mining – blasting site, site camp, ablution facility, accommodation, equipment, storage, sampling storage, site office etc. For mining – excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) Eg. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, decommissioning, closure, post-closure)	SIGNIFICANCE If not mitigated	MITIGATION TYPE (modify, remedy, control, stop through eg noise control measures, storm water control, dust control, rehabilitation, design measures, blasting control, avoidance, relocation etc. Modify through alternative method. Control through noise control, control through management and monitoring)	SIGNIFICANCE If mitigated
					2. Use existing tracks and roads as far as is practicably possible 3. Where track clearing is necessary, raised blade clearing will be conducted to minimise disturbance and assist rehabilitation efforts. 4. Avoid trees (with tree trunks exceeding 200 mm) and large shrubs. 5. mining activities will be conducted during normal working hours (06:30 – 17:30). 6. Vehicle speeds in the area will be limited to 30 kilometres per hour.	
Access to the site (from the main gate)	2. Access control	Site Security	Construction phase	Moderate	7. Enter into an official site access agreement with the land owner. 8. The holder of the mining right will not recruit casual labour in a bid to minimise opportunistic incidents of criminal activity.	Insignificant

NAME OF ACTIVITY (Eg. For Mining – blasting site, site camp, ablution facility, accommodation, equipment, storage, sampling storage, site office etc. For mining – excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) Eg. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, decommissioning, closure, post-closure)	SIGNIFICANCE If not mitigated	MITIGATION TYPE (modify, remedy, control, stop through eg noise control measures, storm water control, dust control, rehabilitation, design measures, blasting control, avoidance, relocation etc. Modify through alternative method. Control through noise control, control through management and monitoring)	SIGNIFICANCE If mitigated
					9. The land owner will be notified of unauthorised persons during the blasting phase. 10. If deemed necessary, the SAPS / Private security company will be informed of unauthorised people present on site.	
Site Access (leading from main access roads to mining area that falls within natural, undisturbed areas)	3. Potential destruction of heritage resources.	N/A. No heritage sites have been identified	N/A	No impact	11. Note: Any sites that may be discovered during the mining period must be reported to the regional Heritage Resources Authority (HRA)	No Impact
Site Access (to mining area that falls within natural, undisturbed areas)	4. Soil compaction resulting from repeated vehicular use (to natural sites only)	Loss of soil as a natural resource	Construction Phase	Low	13. Where track clearing is required, conduct raised blade clearing to minimise surface disturbances. 14. Scarification of compacted road surfaces and drill pads during the rehabilitation process.	Insignificant
Site Access (to mining area that falls within natural, undisturbed areas)	5. Noise vehicular traffic impact affecting cattle and / or wildlife	Loss of fauna	Construction & operational phases	Insignificant	15. mining activities will be conducted during normal working hours (06:30 –	Insignificant

NAME OF ACTIVITY (Eg. For Mining – blasting site, site camp, ablution facility, accommodation, equipment, storage, sampling storage, site office etc. For mining – excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) Eg. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, decommissioning, closure, post-closure)	SIGNIFICANCE If not mitigated	MITIGATION TYPE (modify, remedy, control, stop through eg noise control measures, storm water control, dust control, rehabilitation, design measures, blasting control, avoidance, relocation etc. Modify through alternative method. Control through noise control, control through management and monitoring)	SIGNIFICANCE If mitigated
					17:30). And will not disturb any natural areas. 16. Vehicle speeds in the study area will be limited to 30 kilometres per hour.	
Site establishment (applicable to natural areas only) which includes the following activities: <ul style="list-style-type: none"> Waste generation and management Vegetation clearing Visual impact 	6. Disturbance or destruction of on-site fauna & flora	Loss of fauna & flora	Construction phase	Low	The holder of the right must: 17. Utilise existing access roads / cleared areas. 18. Develop a fire emergency plan to contain and minimise the destruction of vegetation and faunal habitats during the outbreak of a fire. 19. Avoid mining in areas outside the documented footprints.	Insignificant
	7. Disturbances to soils resulting in soil compaction and erosion.	Loss of soil as a natural resource	Construction Phase	Low	20. The loss of topsoil is not applicable	Insignificant
	8. Dust emissions resultant from site clearing, soil stripping	Air quality	Construction Phase	Low	21. In compliance with the Mine Health and Safety Act, the site manager will employ dust suppression	Insignificant

NAME OF ACTIVITY (Eg. For Mining – blasting site, site camp, ablution facility, accommodation, equipment, storage, sampling storage, site office etc. For mining – excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) Eg. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, decommissioning, closure, post-closure)	SIGNIFICANCE If not mitigated	MITIGATION TYPE (modify, remedy, control, stop through eg noise control measures, storm water control, dust control, rehabilitation, design measures, blasting control, avoidance, relocation etc. Modify through alternative method. Control through noise control, control through management and monitoring)	SIGNIFICANCE If mitigated
	and vehicular movement				exercises as and when required.	
	9. Visual impact resultant from visual exposure and viewer incidence.	Loss of "Sense of Place"	Construction Phase	Low	22. Restrict activities within the "designated footprint"	Insignificant
	10. Impact on water courses (Natural storm water drainage lines)	Storm water drainage	Construction & Operational phase	Low	23. Ensure that no site clearing activities take place in water drainage areas.	Insignificant
Mining phase	12. Dust emissions from mining related activities, including vehicular dust	Increase in dust emissions / airborne particles	Operational phase	Low	24. In compliance with the Mine Health and Safety Act, the site manager will employ dust suppression exercises as required. 25. Vehicle speeds in the mining area will be limited to 30 kilometres per hour.	Insignificant
Site rehabilitation including: i. Scarification of compacted soils (access road) ii. Reintroduction of topsoil where relevant.	13. Soil and water pollution resultant from petrochemical spills	Loss of soil and water resources	Operational & Decommissioning	Low	26. No fuel will be stored on-site by the holder of the mining permit. 27. Oils and other petrochemical substances will be stored in an area of "bundled" design. No major repairs or services will be conducted on site.	Insignificant

NAME OF ACTIVITY (Eg. For Mining – blasting site, site camp, ablution facility, accommodation, equipment, storage, sampling storage, site office etc. For mining – excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) Eg. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, decommissioning, closure, post-closure)	SIGNIFICANCE If not mitigated	MITIGATION TYPE (modify, remedy, control, stop through eg noise control measures, storm water control, dust control, rehabilitation, design measures, blasting control, avoidance, relocation etc. Modify through alternative method. Control through noise control, control through management and monitoring)	SIGNIFICANCE If mitigated
Note: Rehabilitation will take place concurrently with the operational phase.					29. The effective use of oil drip trays and petrochemical spill rehabilitation kits is compulsory. 30. Vehicles and other equipment must be inspected on a daily basis for oil leaks.	
	Soil erosion resulting from the reintroduction of topsoil to rehabilitation sites	Loss of soil resources	Decommissioning	Low	31. Re – vegetation will be executed via a “hand seeding process” using indigenous grass. 32. Reseeding of rehabilitation areas will be undertaken if vegetation cover does not exceed 50% after one year. 33. Eradicate any “declared weeds” within the drill site footprints	Insignificant

k) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the Impact assessment and final site layout process and must be in the following tabular form)

Table 11: Specialist reports – summary

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF THE SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA (Mark where applicable with an X)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
<p>➤ Literature studies conducted includes various authors. These studies refer to the general area in which the prospecting site is found.</p> <p>Literature includes: Fauna: ➤ Burger Cillie – The mammals guide of Southern Africa. ➤ I. Sinclair – Veldgids to die voëls van Suider-Afrika. Flora: ➤ Mucina et al., 2006.</p>	<p>Flora</p> <p>N/A – No specialist studies were done. These recommendations are made by the EAP:</p> <ul style="list-style-type: none"> ➤ Create slopes and drainage lines around ➤ vulnerable areas so that soil erosion will be minimised while vegetation is re-established. ➤ Re-vegetate with a mixture of grass species that will quickly establish ground cover to prevent erosion. ➤ Ensure that the dominant grass species in the area are included in the mixture to attain pre-mining land capability. <p>Maintain re-vegetated areas with follow-up vegetation.</p> <ul style="list-style-type: none"> ➤ A mixture of grasses will be planted on all the disturbed areas where topsoil has been replaced. 	<p>N/A – No specialist studies were done.</p>	<p>Part A in: 1) Baseline environment a) Type of environment affected by the proposed activity. Pg. 21 - 34</p>

	<p>Natural open spaces should be left in their undeveloped state and any existing or new exotic vegetation that is present on the site be removed and eradicated.</p> <p>Remove all exotic, invasive vegetation and implement a monitoring and eradication plan to keep the site free from invasive plants.</p>		
	Fauna		
	<p>N/A – No specialist studies were done These recommendations are made by the EAP:</p> <p>(a) Operating hours of the mining operation will be:</p> <ul style="list-style-type: none"> ➤ Weekdays: 06H30-17H30 ➤ Saturdays: 06H30-17H00 ➤ Sundays: no work <p>(b) Noise monitoring will be conducted on a quarterly basis. Should it be found that noise do present an impact above the required standards, the following measures will be implemented:</p> <p>Where possible, work should be restricted to one area at a time, as this will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.</p> <p>The contractor must ensure that no avifauna is disturbed, trapped, hunted or killed during the</p>	<p>N/A – No specialist studies were done.</p>	<p>Part A in:</p> <p>1) Baseline environment</p> <p>a) Type of environment affected by the proposed activity.</p> <p>Pg. 21 – 34.</p>

	<p>mining phase. Conservation-orientated clauses should be built into contracts for personnel, complete with penalty clauses for non-compliance.</p> <p>It is suggested that where work is to be done close to the drainage lines, these areas be fenced off during mining.</p> <p>The uncontrolled spreading of invasive and alien vegetation and trees should be stopped and controlled.</p> <p>No vehicles should be allowed to move in or across the wet areas or drainage lines and possibly get stuck. This leaves visible scars and destroys habitat, and it is important to conserve areas where there are tall reeds or grass, or areas where there are short grass and mud.</p>		
	Heritage Assessment		
No heritage assessment was conducted.	As no sites, features or objects of cultural significance have been identified in the study area, no impact is envisaged. If archaeological sites or graves are exposed during development activities, it should immediately be reported to a heritage consultant so that an investigation and evaluation of the finds can be made.	N/A – No specialist studies were done.	No reference to heritage sites is made in the existing literature.

I) Environmental impact statement

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

Restricting blasting is planned within the designated zone. Preceding surface disturbances relating to Rose Quarts mining are clearly evident.

The Mining activities do not affect any natural storm water drainage lines and natural runoff areas. No evident water bodies exist within the mining area except for drainage system that is over a 100m away from the mining site that leads to the Orange River on Middle Post no. 60, Kakamas, 8870 farm.

This mining operation is best described as a low impact operation since restricting blasting will take place. Environmental Impacts related to invasive mining activities are thus minimised and no significant direct or cumulative environmental impacts are envisaged.

ii) Final site map - Google earth

(Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructures on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers)

The final site map is attached as Appendix D, in the Basic Assessment Report. Also see Figure below for areas where mining is planned.

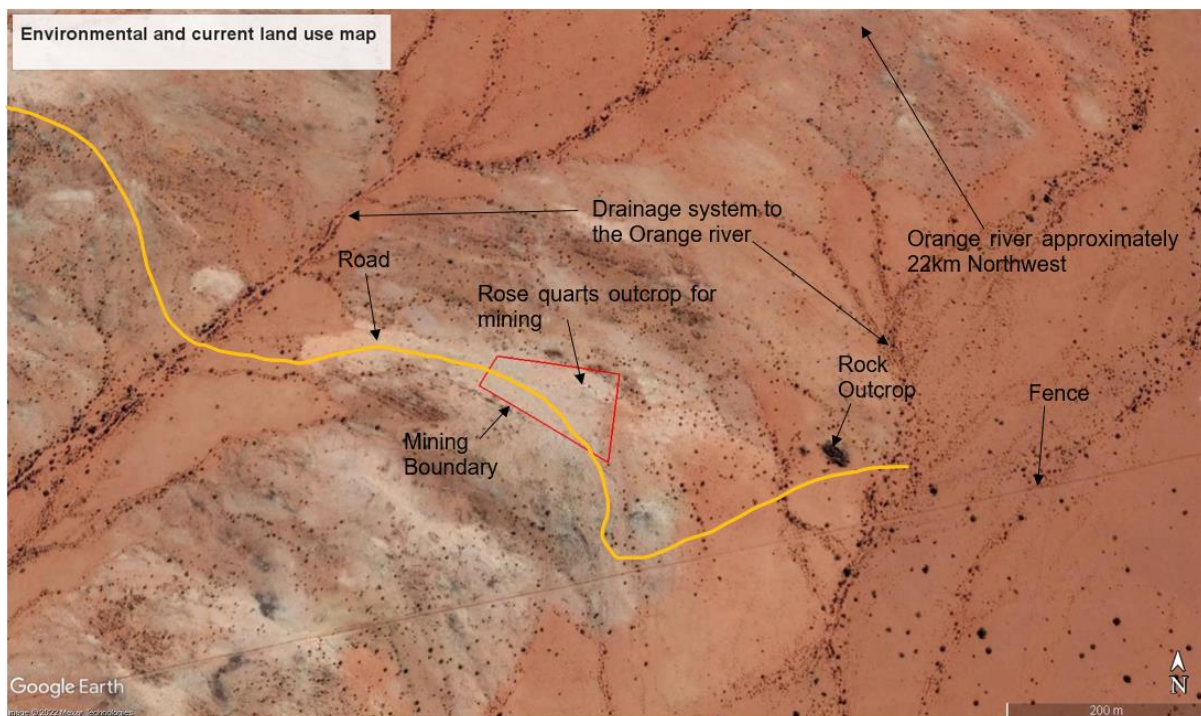


Figure 21 : Final site map of the proposed mining activities.

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

Table 12: Positive and Negative impacts of proposed activity

TYPE OF ACTIVITY	POSITIVE IMPACT	NEGATIVE IMPACT
Site clearance (removal of vegetation and topsoil)	It is an outcrop and there is little to no vegetation	Negative visual impact, loss of vegetation and soil structure.
Restricted Blasting	Significant cumulative impacts are avoided	Soil pollution
Activities in natural/ undisturbed areas (or areas where vegetation occurs.	The total disturbance of operation footprints within natural areas will not exceed 1.1ha	Temporary impacts on biodiversity
Constructing topsoil stockpiles	Topsoil conservation	Soil erosion

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

(Based on the assessment where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.)

The impact management objectives aim to.

- Avoid, minimise, or remedy disturbance of ecosystems and loss of biodiversity
- Avoid degradation of the environment ecosystem integrity.
- Pursue the best practicable environmental option by means of integrated environmental management.
- Protect the environment as the people's common heritage.
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic, or stressed ecosystems

n) Aspects for inclusion as conditions of Authorisation.

(Any aspects which must be made conditions of the Environmental Authorisation)

Due to the low overall impact level of the mining programme, no additional environmental conditions are required. The mining activities are best described as low impact activities within an environment that has low to no vegetation.

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

(Which relate to the assessment and mitigation measures proposed)

Based on the level of disturbance within the planned mining area and site assessments, it is thus assumed that no heritage resources or grave sites exist within the planned mining area.

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

The operation must be authorised since the operation is of insignificant extent, as well as that the operation will not have any significant or lasting impact on the geology, topography, vegetation, and animal life. The site does not require the introduction of infrastructure and the rehabilitation will be done concurrently, ensuring that the lasting impacts are mitigated as soon as they arise.

i) Reasons why the activity should be authorised or not.

The site where mining activities for Rose Quarts are planned is the only site considered due to the specific nature of the outcrop in this area.

Infrastructure and dirt roads are already existent on the proposed mining area, limiting the impact of footprint expansion. The impacts of the activities are furthermore less significant compared to those activities triggering a mining right.

The primary reason for consideration of authorisation for the project is that potential impacts identified in the proposed development is manageable within an environment which has already been altered or modified by mining developments.

Therefore, the Environmental Assessment Practitioner recommends the authorisation of the proposed prospecting activities.

ii) Conditions that must be included in the authorisation.

The holder of the Mining permit is to ensure that mining activities avoid boundary encroachment.

q) Period for which the environmental authorisation is required

Environmental authorisation is required for five years, with an option to renew the Mining Permit after said five years.

r) Undertaking

(Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report)

An undertaking is available on the last page of the EMPR.

s) Financial Provision

(State the amount required to both manage and rehabilitate the environment in respect of rehabilitation)

Based on the low intensity of the proposed mining activities, the amount required to both manage and rehabilitate the environment in respect of rehabilitation **R10 000 (vat inclusive)**.

The cumulative impact of the mining activities will not contribute significantly to the existing environmental impacts.

i) Explain how the aforesaid amount was derived.

Points applicable to the operation are sourced from the 2004 DME Guideline and applied to the methodology as documented under Point i) (Financial provision). See Table 26.

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

The required amount will be made available as per the company resolution and confirmation from the financial service provider.

t) Specific Information required by the Competent Authority

- i) **Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act no 107 of 1998).**

The EIA report must include the;

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

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

The land of concern is privately owned and no known land restitution actions are reserved for the near future.

After displaying site notice, placing the newspaper advertisement, consulting with the landowner, neighbours and the various departmental and governmental departments as outlined in the section titled “details of the public participation process” documented from page 15 of this report, only the Kai!Garib Local Municipality stated that before mining can commence, a rezoning application must be submitted, as the site at the moment is registered as intensive agriculture site.

The lack of interest may be attributed to the low intensity of the proposed mining activity as well as the current setting of the mining activity.

The fact that only one of the concerned parties had a problem may be directly linked to two very important factors which are:

- The mining activities will have a low affect to the existing land use observed in the study area
- The cumulative environmental impact of the planned activities on the environment is insignificant.

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

(Provide the results of the investigation, assessment, and evaluation of the impact of the mining, bulk sampling, or alluvial diamonds prospecting on any national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3.2.11.6 and 2.12.herein)

During the site investigation, no heritage resources were identified. This is due to the rural nature of the area where Middle Post no. 60 farm is located.

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

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

The motivation in support of no reasonable or feasible alternatives is attached as Appendix F.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. Draft environmental management programme

a) Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of EAP are included in part A)

EIM Environmental Solutions (Pty) Ltd
Name: J. van Wyk
Tel No: 083 276 6282 or 0794945575

E-mail address: jana.g.eim@gmail.com
riaanvw103@gmail.com
Postal Address: 6 Shorten Street
Rynfield
Benoni
1501

b) Description of the Aspects of the Activity

(Confirm that the aspects are covered and included in Part A)

Details are documented in Part A - No 3 (b, c & d)

c) Composite Map

(Provide a map Attached as an Appendix, at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers).

See Map Attached under Appendix D in the Basic Assessment Report.

d) Description of Impact Management objectives including management statements

i. Determination of closure objectives

(Ensure that the closure objectives are informed by the type of environment described)

A closure plan aims to adopt a risk-based approach and implementing action plans over a specified timeframe with the following objectives:

- Compliance with legislative and regulatory requirements:
Identify the legal requirements of the Closure Plan in consultation with the relevant regulatory authorities.
- Physical stability:
Ensure that the physical stability of the mining site is consistent with future usage of the site.
- Chemical stability:
Ensure that a framework is in place to mitigate any impact created by site discharges.
- Biological stability:
Ensure that sufficient site rehabilitation is undertaken to facilitate the medium - term re-establishment of flora at areas disturbed by mining activities.
- Public expectations and site amenity potential:
Undertake ongoing public consultation. Maintain amenity values and potential future uses of the site, particularly access roads.
- Aesthetics of the site:
Ensure that the aesthetic appeal of the affected areas are not compromised and rehabilitate the disturbed mining site.

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

The rose quartz mineral will not be extracted using water. Only About 20 litres of water will be kept on site for employees as drinking water.

iii) Has a water use licence been applied for?

The applicant did not apply for a water use license since no water will be used to extract rose quartz mineral.

iv) Impacts to be mitigated in their respective phases.

Table 13: Measures to rehabilitate the environment that was affected by the undertaking any listed activity.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Site clearance applicable to undisturbed areas only which entails the removal of vegetation and topsoil	Construction	The total area of the site (inside undisturbed areas) will not exceed 1.1ha	<p>This activity can only be mitigated once the mining phase has been completed</p> <p>The removed topsoil will be replaced in the area where it had been cleared.</p> <p>Re-vegetation will take place by introducing indigenous grass species in the area.</p>	<p>Rehabilitation Compliance Plan: Detailed action plans will be developed to determine how the objectives are to be achieved.</p> <p>These action plans will cover the following:</p> <ul style="list-style-type: none"> • Which rehabilitation tasks are to be completed? • Who is the responsible person? • The resources required, and the timeline for delivery. • Milestones will be established to facilitate monitoring and measurements. 	Within six months after completion of the mining activity.

Stockpiling of topsoil	Construction	Total area of activities	<p>Topsoil (top 0.25 m layer of soil& vegetation), where available, will be removed and stockpiled separately at a suitable location so that it may be replaced on the exposed subsoil/ backfilling layers (or where it could serve as a suitable environment for seed germination etc.)</p> <p>The height of the topsoil stockpiles, where applicable, will be restricted to 1.8 meters to prevent and minimise erosion.</p>	<p>Rehabilitation Compliance Plan: Detailed action plans will be developed to determine how the objectives are to be achieved.</p> <p>These action plans will cover the following:</p> <ul style="list-style-type: none"> • Which rehabilitation tasks are to be completed? • Who is the responsible person? • The resources required, and the timeline for delivery. • Milestones will be established to facilitate monitoring and measurements. 	Before minig activities commence.
Restricted blasting	Operational	The total area of activities (inside natural, undisturbed areas) will not exceed 1.1ha	<p>No fuel (in bulk tanks) will be stored on- site by the holder of the mining permit. Oils and other petrochemical substances will be stored in an area of “bunded” design. No major repairs or services will be conducted on site.</p>	<p>Rehabilitation Compliance Plan: Detailed action plans will be developed to determine how the objectives are to be achieved.</p> <p>These action plans will cover the following:</p> <ul style="list-style-type: none"> • Which rehabilitation tasks are to be completed? 	Rehabilitation of the site will take place immediately after completion of the area.

			<p>The effective use of oil drip trays and petrochemical spill rehabilitation kits are compulsory.</p> <p>Vehicles and other equipment must be inspected on a daily basis for oil leaks.</p> <p>Re – vegetation will be executed via a “hand seeding”- process using indigenous grass species.</p> <p>Reseeding of areas identified for rehabilitation will be undertaken if vegetation cover does not exceed 50% after one year.</p> <p>Dust control will form part of everyday activities.</p> <p>Eradicate any “declared weeds” within the site footprints</p>	<ul style="list-style-type: none"> • Who is the responsible person? • The resources required, and the timeline for delivery. • Milestones will be established to facilitate monitoring and measurements. 	
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e) Impact Management Outcomes

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

Table 14: Impact management outcomes.

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type (modify, remedy, control or stop through e.g. noise control measures etc)	Standard to be achieved (impact avoided, noise levels, dust levels, rehabilitation, end use objectives etc.)
Site clearance (removal of vegetation and topsoil)	Hydrological changes (surface water drainage). Soil erosion. Dust generation. Loss of vegetation diversity in the area.	Visual, biological and hydrological aspects.	Construction	Dust control and storm water control. Remedy through rehabilitation and re-vegetation after cessation of mining activities. Avoid mining activities within 100 metres of natural drainage areas.	Dust levels controlled as per Mine Health and Safety Act. Rehabilitation.
Stockpiling of topsoil	Soil erosion. A cumulative impact of sedimentation in natural drainage areas may occur.	Biological aspects.	Construction & Operational	Control through restricting stockpile heights to 1.8 metres. Remediate through fertilising soil once replaced for rehabilitation.	Erosion avoided. Rehabilitation.
Mining activities	Soil and water pollution resultant from the disposal of petrochemical substances. Soil erosion. Dust generation. Loss of vegetation diversity in the area.	Visual, biological and hydrological aspects.	Operational	No fuel (in bulk containers) will be stored on- site by the holder of the mining right. Oils and other petrochemical substances will be stored in an area of "bunded" design. No major repairs or services will be conducted on site. The effective use of oil drip trays and petrochemical spill rehabilitation kits are compulsory.	Rehabilitation

				<p>Dust control will form part of everyday activities.</p> <p>Vehicles and other equipment must be inspected on a daily basis for oil leaks.</p> <p>Re – vegetation will be executed via a “hand seeding “- process using indigenous grass species.</p> <p>Reseeding of rehabilitation areas will be undertaken if vegetation cover does not exceed 50% after one year.</p> <p>Eradicate any “declared weeds” within the drill site footprints</p>	
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f) Impact Management Actions

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

Table 15: Impact management action

Activity	Potential Impact	Mitigation type	Time Period for Implementation	Compliance with standards
Site clearance (removal of vegetation and topsoil)	<p>Dust generation.</p> <p>Hydrological changes (surface water drainage).</p> <p>Soil erosion.</p> <p>Loss of vegetation diversity in the area.</p>	<p>Dust control and storm water control.</p> <p>Remedy through rehabilitation and re-vegetation after cessation of mining activities.</p>	Construction phase	<p>Impact minimised,</p> <p>Dust levels to comply with Mine Health and Safety Act.,</p> <p>Erosion minimised.</p> <p>Noise levels to comply with Mine Health and Safety Act.</p>

Stockpiling of topsoil	<p>Soil erosion.</p> <p>A cumulative impact of sedimentation in natural drainage areas may occur.</p>	<p>Control through restricting stockpile heights to 1.8 metres.</p> <p>Remediate through fertilising soil (if required) after the topsoil replacement phase</p>	Within six months after completion of the mining phase	Impact avoided.
Restricted blasting	<p>Dust and noise generation.</p> <p>Increase in safety hazard.</p> <p>Potential soil pollution.</p>	<p>No fuel (in bulk containers) will be stored on- site by the holder of the mining right.</p> <p>Oils and other petrochemical substances will be stored in an area of “bunded” design.</p> <p>No major repairs or services will be conducted on site.</p> <p>The effective use of oil drip trays and petrochemical spill rehabilitation kits are compulsory.</p> <p>Vehicles and other equipment must be inspected on a daily basis for oil leaks.</p> <p>Re – vegetation will be executed via a “hand seeding “-process using indigenous grass species.</p> <p>Reseeding of rehabilitation areas will be undertaken if vegetation cover does not exceed 50% after one year.</p>	<p>Mitigated during rehabilitation phase.</p> <p>(Concurrent rehabilitation and rehabilitation during the decommissioning phase)</p>	<p>Impact minimised,</p> <p>Dust levels to comply with Mine Health and Safety Act.,</p> <p>Erosion minimised.</p> <p>Noise levels to comply with Mine Health and Safety Act.</p>

		<p>Eradicate any “declared weeds” within the mine site footprints.</p> <p>Dust control will form part of everyday activities.</p>		
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i. Financial Provision

1) Determination of the amount of Financial Provision

Table 16: Indicates which closure components are applicable to the mining operation.

No.	Closure Component	Applicability	Comment/Motivation
1	Dismantling of processing plant and related structures (Including overland conveyors and power lines)	<i>Not Applicable</i>	A processing plant will not form part of the proposed development
2(A)	Demolition of steel buildings and structures	<i>Applicable</i>	Containers will be used for as storage and office facilities
2(B)	Demolition of reinforced concrete buildings and structures	<i>Not Applicable</i>	Reinforced concrete buildings and structures will not form part of the proposed development
3	Rehabilitation of access roads	<i>Applicable</i>	Any additional access road that might be constructed by the applicant, will be rehabilitated
4(A)	Demolition and rehabilitation of electrified railway lines	<i>Not applicable</i>	No electrified railway lines exist on the mining site
4(B)	Demolition and rehabilitation of non-electrified railway lines	<i>Not applicable</i>	No non-electrified railway lines exist on the site
5	Demolition of housing and/or administration facilities	<i>Not applicable</i>	No Existing housing and/or administration facilities are on the site
6	Opencast rehabilitation including final voids and ramps	<i>Not applicable</i>	Mining is the only proposed invasive activity
7	Sealing of shafts, adits and inclines (Capping of boreholes)	<i>Not applicable</i>	No Capping/ Sealing/filling of boreholes will take place
8(A)	Rehabilitation of overburden and spoils	<i>Applicable</i>	The application includes the creating of overburden and spoils
8(B)	Rehabilitation of processing waste deposits and retention ponds (basic, salt-producing waste)	<i>Applicable</i>	The application includes the creating of processing waste deposits.
8(C)	Rehabilitation of processing waste deposits and retention ponds (acidic, metal-rich waste)	<i>Applicable</i>	The application includes the creating of processing waste deposits.
9	Rehabilitation of subsided areas	<i>Not applicable</i>	This is only applicable to underground mining
10	General surface rehabilitation	<i>Applicable</i>	Erosion control, landscaping, seeding, and ripping of compacted areas are included under this item.
11	River diversions	<i>Not applicable</i>	No river diversions will be applicable
12	Fencing	<i>Applicable</i>	The mining area will require fencing.
13	Water management	<i>Not applicable</i>	The impact of the operation on water quality is unlikely.
14	2 to 3 years of maintenance and aftercare	<i>Applicable</i>	Maintenance components are applicable. This conclusion is based on the applicability of several aspects listed above.
15	Specialist studies	<i>Undetermined</i>	The only specialist studies that will be required are at areas where vegetation struggles to establish. These studies will include soil analysis and soil amelioration proposals. One should also take into account that soil tests are included in the seeding process as provided for in the revegetation process.

Closure components applicable to the proposed mining activities for determining the quantum for financial provision as presented in the 2004 DME Guideline document:

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

The mining activities are comprised of two main phases.

- **Non - invasive mining activities which include:**
 - Investigate all sources for historical data.
 - Geological resource estimation based on the identified outcrop.
 - Feasibility Study

- **Invasive mining activities which include:**
 - Mining will take place in undisturbed areas.
 - Mining site planned will not exceed a combined area of 1.1 ha
 - Rehabilitation activities in the mining area mainly involve the following tasks in an effort to align closure objectives with the baseline environment:
 - i. Rehabilitation of processing wastes deposits and retentions ponds
 - ii. Eradication of declared invader plants.
 - iii. Reintroduction of topsoil at designated areas.
 - iv. Scarification of compacted areas and soil amelioration if applicable.
 - v. Seeding of disturbed areas.
 - vi. Aftercare and maintenance which includes the continual eradication of declared weeds.

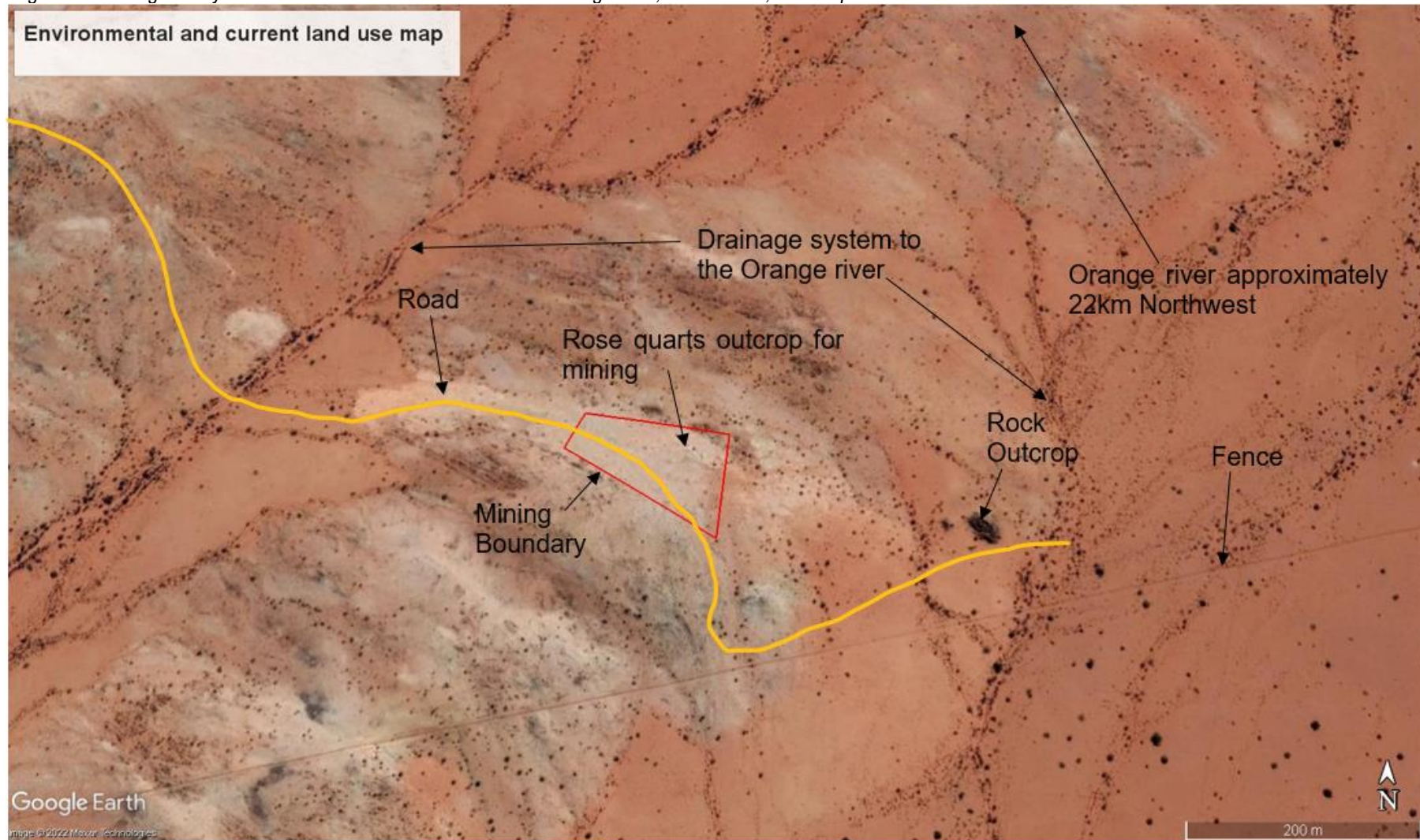
b) Confirm specifically that the environmental objectives in relation to closure have been consulted with the landowner and also interested and affected parties.

Environmental objectives identified and discussed in the Draft BAR which will be presented to the landowner and registered I&AP's during the Basic Assessment Report and EMPR review period.

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

Based on the fact that restricted blasting will take place within designated zones the scale and aerial extent of the exact positions of mining are not currently available.

Figure 22: Mining activity will be restricted to area of 1.1ha within the general, undisturbed, area depicted below.



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

The rehabilitation plan is compatible with the closure objectives since proposed mining operation will not contribute significantly to the cumulative environmental impact of the existing or past land uses, in addition to the fact that the extent and the intensity of the proposed mining activities and impacts can be easily mitigated.

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

Section 41 of the MPRDA (Mineral and Petroleum Resources Development Act of 2002) and regulations 53 and 54 promulgated in terms of the MPRDA deal with financial provision for mine rehabilitation and closure. Page 5 of the DME guideline document implies that the guideline is generic in nature and does not answer all possible questions or deal with all situations relating to financial provision, rehabilitation and mine closure. Further advice and/ or experience may also be required, based on circumstances that prevail at specific mining sites, in order to fully assess the quantum for financial provision.

According to the guideline document, the relevant sections documented within the MPRDA (Act 28 of 2002) which deal with the financial provision are as follows:

- “Section 41(1), requires that an applicant for a prospecting right, mining right or mining permit must, before the Minister approves the environmental management plan or environmental management programme (EMP) in terms of Section 39(4), make the prescribed “financial provision” for the rehabilitation or management of negative environmental impacts,”
- “Section 41(2) provides that, if the holder of a prospecting right, mining right or mining permit fails to rehabilitate or manage, or is unable to undertake such rehabilitation or to manage, any negative impact on the environment, the Minister may, upon written notice to such holder, use all or part of the financial provision to rehabilitate or manage the negative environmental impact in question,”
- “Section 41(3) requires the holder of a prospecting right, mining right or mining permit to annually assess his or her environmental liability and increase his or her financial provision to the satisfaction of the Minister, and”
- “Section 45, allows the Minister to recover costs in the event of urgent remedial measures.”

Table 17: Basic information used for formulating the rehabilitation cost for < 1.1ha

Envisaged surface disturbances within undisturbed areas only	< 1.1ha (max)
Planned disturbance per year (m ²)	< 1.1ha (max)

The calculation of the quantum of the financial provision is documented in Table 26 and is based on the fact that the site will not be transformed to a significant extent. The existing estimate totals R10 000.00.

Table 18: Calculation of the quantum

No	Description	Unit	Quantity	Master Rate	Amount (rands)
1	Demolition of buildings	m3	0	N/A	0
2	Rehabilitation of access roads	m2	50	39,4	1970
3	Backfilling of mining area	m3	1,1	3500	3850
4	River Diversions	ha	0	N/A	
5	Fencing	m	0	N/A	
6	Water Management	ha	0	N/A	
7	General surface Rehabilitation	ha	1,1	1900	2090
8	Maintenance and aftercare	ha	1,1	1900	2090
					10000

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

As documented in the declaration, the financial provision will be provided as determined

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

g) Monitoring of Impact Management Actions

h) Monitoring and reporting frequency

i) Responsible person

j) Time period for implementing impact management actions

k) Mechanisms for monitoring compliance

Table 19: Mechanisms for monitoring compliance.

Source activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
Site clearing (removal of topsoil and vegetation) applicable to activities in natural/ undisturbed areas.	Erosion and loss of biodiversity on the site	Visually assess area for sections that will be prone to erosion processes as part of scheduled site investigations	Due to the extent of this small-scale operation, the project manager will take responsibility for the internal monitoring programme. External Monitoring and reporting will be executed by an independent environmental specialist.	Identify areas susceptible to erosion after rainfall events. Implement erosion control measures within 2 working days after site has been cleared. Repair erosion control structures (if required) within 5 days after rainfall events. Report on erosion and biodiversity in Annual Environmental Performance report by independent consultant.
Establishment of topsoil/ growth medium stockpiles	Soil erosion invader plants/ declared weeds species.	Ensure that soil stockpiles do not exceed 1.80 metres in height. Ensure that stockpiles are vegetated with indigenous grass seed mixes. Identify declared weeds on the site.	Mine manager	Monitor soil stockpile heights on a weekly basis Stockpile soil in designated sections on the same day when site clearing takes place. Monitor the site for declared weeds and eradicate declared weeds

Source activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (for the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
				<p>on a monthly basis.</p> <p>Report on soil erosion and the control of declared weeds in Annual Environmental Performance report by independent consultant.</p>

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

The required performance assessment/ environmental audit report will be compiled on an annual basis or otherwise as instructed by the DMR.

m) Environmental Awareness Plan

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

Employees/ Contractors will receive “induction training” before the mining activity commences. Environmental training and awareness will form part of induction training. The scale and workforce of the operation are small. Therefore any environmental and health and safety related risks are easily manageable.

By complying with the Mine Health and Safety Act, 1996 (Act No 29 of 1996), safety and awareness training will also be conducted. To ensure their understanding, employees will confirm in writing that they have received and understood the training objectives.

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

• *Environmental Risks associated with equipment, machinery, and vehicles*

Petrochemical spill incidents will be reported and addressed immediately by use of petrochemical spill rehabilitation kits which are to be kept on site at all times. Vehicles and machinery will be serviced on a regular basis and oil trays will be placed under oil leaking vehicles when parked. Equipment will not be serviced on site and no fuel tanks are planned to be kept on site since bulk fuel supplies are not required.

Rehabilitation kits can fit inside the cabin of standard vehicles and comprise the following items:

▪ 1 x 5L Petrochemical Absorbent	▪ 5 x Absorbent Pads
▪ 1 x 1.2m Sock (To contain spillages)	▪ 1 x 200mm x 400mm Pillow
▪ 1 x Pair of Goggles	▪ 1 x Pair of Nitrile Gloves
▪ 1 x Chemical Resistant Apron	▪ 1 x Brush and Pan
▪ 1 x Dust Mask	▪ 2 x Disposal Bags and Ties

- *Airborne Pollutants*

The mining operation is subjected to the regulations contained in Mine Health and Safety Act. Since dust will be generated on the site, all employees and authorised visitors that are subjected to areas where dust is generated, will be issued with PPE (Personal Protective Equipment). Employees that do not wear PPE will be subjected to disciplinary processes.

In order to reduce the impact of dust, the manager will use water to suppress sections where dust may be a risk.

- *Noise*

Earthmoving machinery is known for producing sound levels (vibrations) that exceed 75 decibels. Depending on the size and age of the earthmoving machine, sound levels exceeding 85 decibels are regularly recorded.

All employees and visitors that are in close range of blasting, excavators, front-end loaders or articulated dumper trucks will be required to wear Personal Protective Equipment.

Blasting and earthmoving will be limited to normal working hours (06:30 – 17:30) during weekdays. On Saturdays working hours will be from 06:30 – 15:00. No work will take place on public holidays or Sundays.

- *Erosion control*

Areas on site which are susceptible to erosion processes, are usually visible after rainfall events. Small erosion gullies will form on steep angles and where vegetation was cleared. Without the implementation of erosion control measures small gullies will erode further which might affect the land use and land capability of the receiving environment.

Topsoil or other soils allocated for future rehabilitation will be stockpiled on the site (within designated areas) not exceeding the height of 1.8 meters.

- *Rehabilitation plan*

A rehabilitation and environmental management plan during the operational and post-operational phases will include the following actions:

- Spreading of stockpiled topsoil over backfilled sections.
- Establish fertile soil conditions through proven soil amelioration practices to sustain micro-organisms, plant species and to improve biodiversity.
- The construction of erosion control berms where required.

- Reintroduction of endemic flora in the area and required water quality that would sustain ecosystems and promote biodiversity,
- The removal or eradication of invader/ exotic flora.
- Annual site monitoring will form part of the process of identifying environmental risks and reports on the sustainability of rehabilitation.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

Financial provision will be reviewed annually and forwarded to the Department of Mineral Resources – Northern Cape as prescribed in terms of Section 41(3) of the MPRDA.

The rehabilitation/ mitigation or closure cost estimates will form part of the annual environmental performance assessments as prescribed in terms of Regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

2. UNDERTAKING

The EAP hereby confirms

The correctness of the information provided in the reports

- a) The inclusion of comments and inputs from stakeholders and I& IPs

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Note: This is a draft document that is made available to registered interested or affected parties. Comments or concerns will be documented in the final report.

- b) The inclusion of inputs and recommendations from the specialist reports where relevant and

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- c) That the information provided by the EAP to interested and affected parties and responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein

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Signature of the:

Environmental Assessment Practitioner

Name of Company

Date

- END -