mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING.

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

NAME OF APPLICANT: MAFISA MINING (PTY) LTD

TEL NO: **064 214 9546**

FAX NO: **086 510 7120**

POSTAL ADDRESS: **PO Box 448**
Springbok
8240

PHYSICAL ADDRESS: **107 Voortrekker Avenue**

Springbok

8240

FILE REFERENCE NUMBER SAMRAD: (NC) 30/5/1/2/2/0505 MR WITH RENEWAL NUMBER

(NC) 30/5/1/2/2/10185MR AND SECTION 102 NUMBER NC-00191-MR/102

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 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.

OBJECTIVE OF THE SCOPING PROCESS

1. The objective of the scoping process is to, through a consultative process—

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

SCOPING REPORT

Contact Person and correspondence address

a) Details of:

i) The EAP who prepared the report:

Name of the Practitioner: Roelien Oosthuizen

Tel No.: 084 208 9088

Fax No.: 086 510 7120

e-mail address: roosthuizen950@gmail.com

Physical Address: Farm Oberon, Kimberley, 8301

Postal Address: P O Box 110823, Hadisonpark, 8306

Appointed by:

Mafisa Mining (Pty) Ltd

Contact Person: Louis Petrus Liebenberg or Buks Potgieter

Mobile: 082 577 3112

Email: louis@foreverdiamondsandgold.co.za or

bukspotgieter002@gmail.com

ii) Expertise of the EAP

(1) **The qualifications of the EAP**

(With evidence attached as Appendix 1)

Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)

(2) **Summary of the EAP's past experience**

(Attach the EAP's curriculum vitae as Appendix 2)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc. *See attached CV.*

b) Description of the property

Farm Name:	**A 442.7358 ha portion of Portion 5 of the Farm Kammagas No. 200 situated in the Nama Khoi Local Municipality and Namakwa District Municipality of the Namakwaland administrative district of the Northern Cape. The property is registered in the name of The Gemeenskap van Komaggas by virtue of Title Deed T102440/1998 (Figure 1).** **LPI code C05300000000020000005.** **Approximate centre of mining area** **Latitude S29.60476°** **Longitude E17.48487°** **Local authority and Administrative district** **Local authority: Nama Koi Local Municipality** **Administrative district: Namakwaland**
Application area (Ha)	**442.7358 Ha (Four hundred and forty two comma seven three five eight hectares.)** **Resource areas 93.2871Ha (Area 1, 2, 3 and 4)** **Artisanal and Small-Scale Mining 33Ha (Area 5)** **Mined area 177Ha** **Infrastructure and mine logistics 1.83Ha (Area 7)** **Access Road 4.37 km (please refer to Figure 2)**
Magisterial district:	**Namaqualand**
Distance and direction from nearest town	**The Buffelsbank mine lies in the Lower Buffels River Valley, which forms part of the vast coastal plain between the Namaqualand Metamorphic Mountain land and the West Coast of South Africa. The**

	road from Springbok descends impressively from the escarpment into the valley below via the Spektakel Pass (Figure 1). The mine is situated off the R335 between Springbok and Kleinzee about 50 km east of Springbok in the Namakwa district, Northern Cape Province. The mine is situated within jurisdiction of the Nama Khoi local authority of the Namakwa District Municipality with an approximate centre Latitude S29.60442 ° and Longitude E17.48358°
21 digit Surveyor General Code for each farm portion	C05300000000020000005

c) Locality map
(show nearest town, scale not smaller than 1:250000**)**

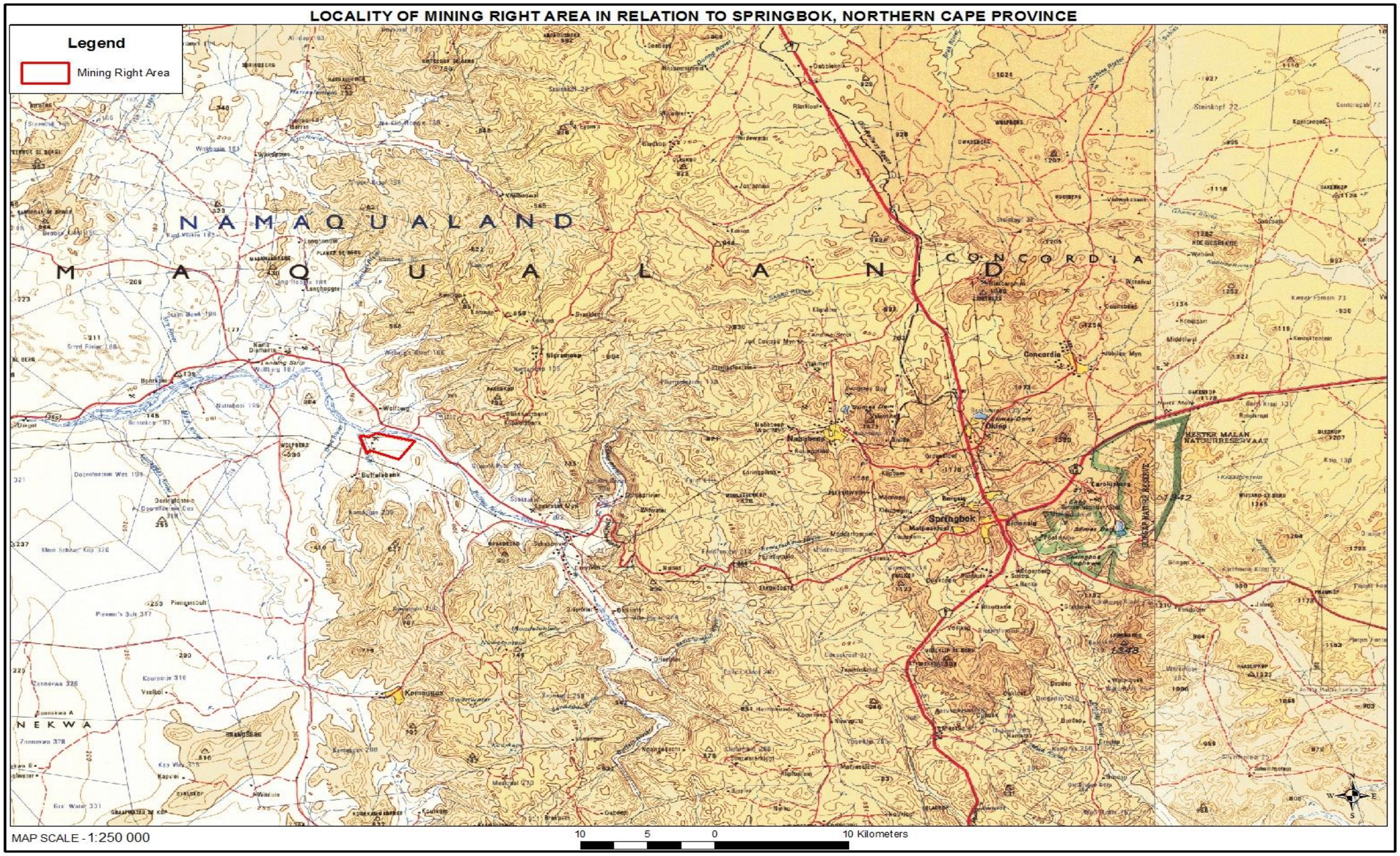

Figure 1. Locality Map

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

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

Figure 2. A plan indicating the overall location and extent of listed activities and main infrastructure Mine logistics, Security and Access Control

Table 1: Listed and specified activities

Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water distribution Pipelines	X	NEMA: LN1 (GNR327)
Activity 12: "The development of— The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse"** Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the mining site.	X	NEMA: LN1 (GNR327)
Activity 13: The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic meters or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014	Possible storage dam and tanks	X	NEMA: LN1 (GNR327)
Activity 24: The development of a road- (ii) a road with a reserve wider than 13,5 meters or where no reserve exists where the road is wider than 8 metres.	Access and haul roads 10 000m²	X	NEMA: LN1 (GNR327)

Activity 17: Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including – (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, 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. The Mafisa operation directly relates to mining of a mineral resource (diamonds) and requires a mining right.	442.7358 Ha	X	NEMA: LN2 (GNR325)
Activity 14: The development and related operation of facilities or infrastructure for the storage and handling of dangerous goods (fuel), where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic meters.	2 X 23 000l diesel tanks = 46 000l with capacity for storing of old oils and new oils to be calculated	X	NEMA: LN1 (GNR327)
Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	±250 ha	X	NEMA: LN2 (GNR325)
Activity 12(g): The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such list, within an area that has been identified as	X	NEMA: LN3 (GNR 324)

	critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans;		
Activity 11: The establishment of residue deposits resulting from activities which require a mining right.	0.3ha		NEMWA: Category B (GNR 633)
Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles Water tanks	± 200 m² ± 300 m² ± 2 000 m² ± 250 m² ± 30 m² ± 500 m² 5 000 m² 3m x 3m = 9m² each ALL FOOTPRINTS WILL BE CONFIRMED BY SURVEY		Not Listed
Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.	15m x 30m = 450m²		Not Listed

ii) Description of the activities to be undertaken

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

Mining Method

Mafisa Mining will make use of the open cast mining method as described below. Mining is to take place as a continuation of earlier surface mining and briefly entails;

- the removal of overburden above the diamond bearing gravels and clays by excavator and dozer to expose the gravels and diamondiferous clays which overlie the bedrock;
- removal of the diamondiferous clays and gravels which will be sent to the plant for processing and diamond recovery; and
- the sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing.

The first stage of mining will involve the mining of the proven reserves (Areas T1 & T2 as seen in Fig. 2). The reason for this is that these blocks are situated closest to the current plant site. Furthermore, the mining of these areas will also enable the company to create a slot into the paleochannel from where long wall mining can continue as well as to remove terrace gravels in order to unlock more paleo gravels.

The next stage will involve mining of block C1 from where long wall mining will continue to block C2 to C6. Preliminary planning is to move then to the proven reserves (Areas T3 & T4 Figure 2) followed by mining the rest of the paleo channel block C7 and C8. Depending on grade, the final stage would be mining of the terrace gravels block T5, still regarded as an inferred resource. The gravel will be mined by means of strip mining on long benches. The solidified sands (overburden horizon) will be removed in with three benches, each with a BW of 5m and BH of 13m.

Shallow paleo channels also exist on the northern and western portions of the mining area and these areas needs to be worked by hand. This will be done by small miners from the local community in partnership with the company under cover of this mining right and EA. In the centre of the mine pit there is also an area where the bedrock still needs to be swept and this will also be done by small miners from the local community in partnership with the company.

Excavation process

A layer of topsoil ±50cm thick will be removed from the new mining blocks. Only 50% of the topsoil recovered will be stockpiled for rehabilitation of the new mining blocks and the rest will be used to cover the existing mined-out sections on a continuous basis as stripping is taking place. will be replaced on the mined-out sections. The topsoil stockpiles for rehabilitation of the new mining blocks will be placed within the mine pit and no new stockpiles will be created above natural ground level.

Overburden handling will generally occur along the principles of a cut & fill strip mining operation where the removed overburden is used immediately in the

backfill of previously mined cuts. No overburden will be dumped on natural ground level.

The top layer of gravel is bulldozed onto stockpiles from which it is loaded into Articulated Dump Trucks (ADT's) either by excavator or front-end loader for transport. The remaining 1-1.5 m of gravel is then removed from the uneven calcrete substrate by means of an excavator. Excavation continues to the base of the gravels where higher basal grades are expected to occur. Where the bedrock is soft, approximately 20cm of bedrock is excavated with the gravels, so that any diamonds in the weathered rock will be recovered. The primary gravels are subjected to infield screening to -35mm by means of a mobile screening plant. The screened material (ore) is then transported by ADT's to the diamond processing area where it is stored on the ore stockpile to be processed.

Mineral processing

Material from ore stockpile is fed into the trommel screen feed bin using a front-end loader. The material is combined with water introduced into the scrubber from the clear water return dam. The discharge of the scrubber is directly into the trommel screen which scalps the material at ±35 mm.

All oversize material is transported via a conveyor to a temporary stockpile from where it will be used to backfill excavations. Material 2.5-35 mm is transported to the pan's rotary distributor via a conveyor belt equipped with a weightometer used to record the feed tonnage to the pan, panfeed on average 80tph.

Undersize material and slurry from the trommel screen are pumped to a separator cyclone situated above the pan tailings bin. The cyclone underflow discharges directly into the bin whilst the cyclone overflow discharges into a sump, which is then pumped to an agitated pulp header tank situated above the pan. Pulp from the header tank is introduced into the rotary distributor where it is combined with the feed material and discharged directly into the pan.

The tailings from the pan (overflow) discharges continually onto an individual dewatering screen, coarse residue (CR) discharges onto common transfer conveyor and the screen undersize and slurry (FR) reports to a central sump. The slurry is pumped to a dewatering cyclone and dry slimes discharges to the mine FRD within the excavation. The CR tailings are transported via conveyor belt to the pan tailings bin where it is combined with the separator cyclone underflow; this material is then dumped into the relevant open excavations as part of the on-going rehabilitation process.

The concentrate from the pan is collected in a concentrate bin and moved to the final recovery area where final concentration takes place by means of pleitz jigs before it is moved to the sorting tables for final sorting by hand.

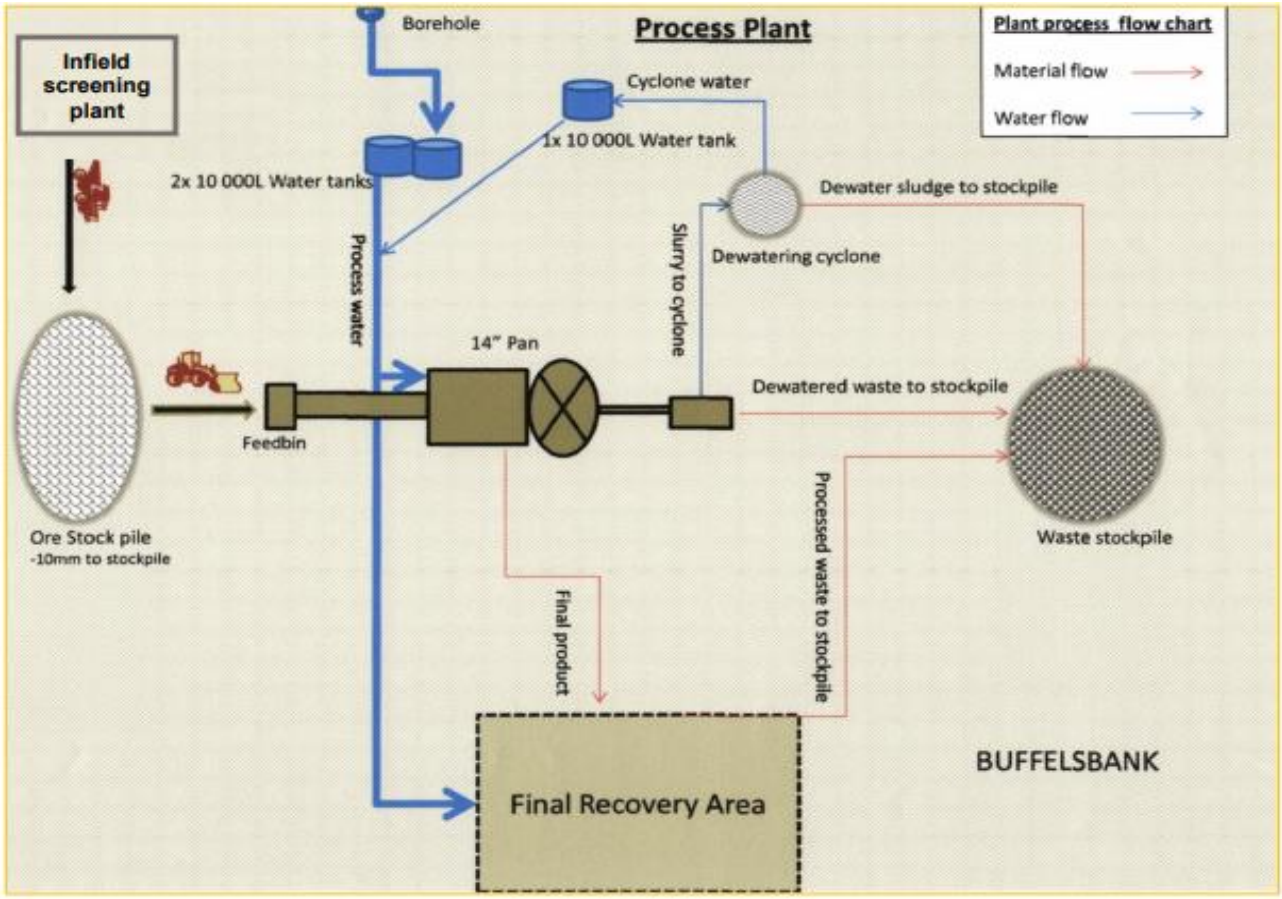

Figure 3. Schematic process flow

Rehabilitation

On completion of the mining operation, the various surfaces, including the access roads, the office area, storage area, will finally be rehabilitated. All remaining material on the surface will be removed to the original topsoil level. This material will then be backfilled into the depressions. Any compacted area will then be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped. All infrastructures, equipment, screening plant, and other items used during the operational period will be removed from the site. All available material will be used during backfilling to avoid the existence of dangerous excavations. After rehabilitation has been completed, all roads will be ripped or ploughed, fertilized and seeded, providing the landowner does not want them to remain that way and with written approval from the Director Mineral Development of the Department of Mineral Resources.

Associated Infrastructure

This is an operational mine with all infrastructure and bulk services already in place. Due to the fact that the mine was not operational fulltime vandalism by illegal diggers did take place and upgrading and maintenance of infrastructure will be required at start up. Activities, such upgrading the existing logistical facilities and roads will not take long and are not critical for production to resume as processing will be by means of mobile wash plants.

As part of the construction phase a site perimeter fence around the Project Area will be required for safety and security purposes due to the existing problem with illegal miners. Control measures needs to be put in place as part of future mining operations to restrict and perturb persons from any unauthorised access.

Electricity

Eskom power is available at the infrastructure area via a 1 kV overhead line but the infield wash plants will make use of portable generators. Power supply to the logistical facilities needs to be upgraded and underground cables demarcated. In order to establish power to the project site existing installations will be upgraded. This will include generator bay ancillary services, control room building, protection equipment, metering equipment, and power network control and communication systems for the power station.

Water

The limited volume of potable water will be obtained through the Nababeep, Kleinzee pipeline which runs along the R335 road and supplied by the local authority. Potable water will also be make-up from rainwater collected from the mine infrastructure and stored in tanks.

Service water supply to the logistical facilities needs to be upgraded and underground pipelines demarcated. Service water will be stored in 3 X 10 000 litre plastic tanks. About 90% of the process water is recycled and the top-up will therefore be on average 6m³/hour for an 8-hour working day giving a maximum top up of 48m³/day. Water is stored in in the existing reservoir at the infrastructure area.

As Africa is a water scarce continent and mining activities often pose significant water pollution risk, it is of utmost importance to properly manage water usage and disposal on a mining operation. For this reason, all dirty rainfall run-off and grey water will be collected, stored and recycled as far as possible. All clean rainfall run-off should be diverted from dirty and contaminated areas to minimise the risk of environmental and water pollution. Trenches and/or berms will be constructed to divert clean storm water run-off to natural drainage channels and to collect dirty run-off and route dirty water to suitable evaporation dams.

Ground Water

Process and service water is obtained from Municipal pipeline although two boreholes are present on the mining area. Borehole one is used by another mining company and the borehole at the new plant is decommissioned. The company will inspect the borehole and have pump tests conducted on it. If it is required to supplement the piped water, water will be obtained from this borehole and an application to this regard was submitted to the Department of Water Affairs.

Waste Management

Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or

inappropriately foul the surrounding environment with faeces or urine. Sewage will be collected in septic tanks across the operation and fed to a sewage treatment plant for treatment. Water from this plant will be recycled and utilised as service and process make up water. Acceptable hygienic and aesthetic practices will be adhered to.

All domestic waste will be collected in bins located strategically around the site i.e. at the processing plant, offices, workshop and personnel amenities. The domestic waste is to be collected on a weekly basis and placed in the designated temporary waste storage area to be constructed from where it will be disposed of at a municipal dump site in Springbok.

The temporary storage area for waste will include a facility for tyres, oil and fuel waste handling. This facility will have a concreted floor and be fitted with a low ridge at the leading edge, guiding run-off water into an oil trap. This temporary storage area will be securely fenced and a separate area will be identified and demarcated (by fences) for temporary storage of scrap steel and equipment prior to sale as scrap. Regular sale and collection of scrap for the site will be arranged.

Access and Haul Roads

The mine is serviced by a well-maintained gravel road the (R335) from Springbok to Kleinzee. The existing public road from the R355 to Komaggas via Buffelsbank mine will serve as access. This access road is 3.3km in length and average 8 m wide and is therefore sufficient to accommodate 2-way traffic. This road will remain as part of the public road network but regular maintenance by the mining company would be required. Access control needs to be put in place at the mine entrance to minimize travel of locals into the project area and inadvertent contact with large earth moving vehicles.

Haul roads of 1.9Km and less than 8m in width leading between the mine pit and mine logistics are in place. No further access and haul roads are planned.

Sudden heavy thunderstorms with subsequent flooding can destroy roads. Erosion control and management measures including safety aspects such as berms, dust control and road signage will be put in place.

Mining Schedule

The infrastructure of the area for mining is all available, Activities, such upgrading the existing roads will not take as long. The preparations of the excavation site/s will mainly the stripping of overburden and the insertion of proper benches. Production will commence immediately at start-up as mining is to take place as a continuation of earlier surface mining. Although production can be at full scale at start up provision is made for a reduced production rate during the first 3 years to allow for upgrading and maintenance of infrastructure. The production for the first two years is estimated at 50% of full production and 75% for the third year. Production will increase from 15350Mt in year 1 to 30700Mt in year 4. The production will thereafter stay constant and can only be increased by introducing additional wash plants to increase processing. Using the production rate and available resource the life of mine is estimated at 16 years.

Mining Procedures

This is an operational mine with all infrastructure and bulk services already in place. Due to the fact that the mine was not operational fulltime vandalism by illegal diggers did take place and upgrading and maintenance of infrastructure will be required at start up. Activities, such upgrading the existing logistical facilities and roads will not take long and are not critical for production to resume as processing will be by means of mobile wash plants. Production will commence immediately at start-up as mining is to take place as a continuation of earlier surface mining.

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e) Policy and Legislative Context

Table 2: Policy and Legislative context

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	- Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA	- Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right	- To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions.	- To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	- Control measures are to be implemented upon the approval of the EMPR.
Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.

Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Mining Right has been applied for ((NC) 30/5/1/2/2/10185 MR). - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal) - Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption)	- Control measures are to be implemented upon the approval of the EMPR.

	- Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)	
National Environmental Management: Air Quality Act (Act 39 of 2004)	- Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)	- Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations. Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered.

	Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List fo Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)	
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa"s natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	If any protected vegetation is identified the necessary permit application will be done.
National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities	- To be implemented upon the approval of the EMPR.

	- Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	- A permit application regarding protected tree species need to be lodged with DAFF if necessary.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface	- Control measures are to be implemented upon the approval of the EMPR.

	or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse;	- A water use application is in the process of preparation and will be lodged with Department of Water and Sanitation (DWS). - Control measures are to be implemented upon the approval of the EMPR.

	(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))	
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.	- Control measures are to be implemented upon the approval of the EMPR.
Northern Cape Nature Conservation Act (Act 9 of 2009)	- Addresses protected species in the Northern Cape and the permit application process related thereto.	- A permit application regarding provincially protected plant species as well as for large-scale harvesting

		of indigenous flora need to be lodged with DENC if necessary. - Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- Section 8: General duties of employers to their employees. - Section 9: General duties of employers and self-employed persons to persons other than their employees.	- Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Northern Cape Planning and Development Act (Act 7 of 1998)	- To control planning and development	- To be implemented upon the approval of the EMPR.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR

Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GN24, PG329, 24/07/1998)	- Regulations re Northern Cape LDO's	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like; - Agriculture, land survey S10	- To take note.
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR
Municipal Ordinance, 20/1974	- To control pollution, sewers etc.	- To be implemented upon approval of the EMPR
Municipal Ordinance, PN955, 29/08/1975	- Nature conservation Regulations	- To be implemented upon approval of the EMPR
Cape Land Use Planning Ordinance, 15/85	- To control land use planning	- To take note.
Cape Land Use Planning Ordinance, PN1050, 05/12/1988	- Land use planning Regulations	- To take note.

f) Need and desirability of the proposed activities.

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

The Buffelsbank Project is in line with the 'Beneficiation Strategy for the Minerals Industry of South Africa' (DMR, 2011) in terms of aiming to beneficiate diamonds for sale/export. The benefits of this will fall directly to the Northern Cape Province and, specifically, the Namaqua District.

In addition, the South African National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. The Buffelsbank Project will contribute to achieving this plan in terms of direct and indirect employment of people from the local and district municipalities as well as investment in the region and on a national scale.

Need

Analysis of the Diamond Industry – ALROSA (website)

The Information on the analysis of the diamond industry was obtained from the ALROSA website whi is one of the biggest diamond producers in the world.

The world diamond market is represented by diamond mining and trade in rough diamonds. The bulk of the world diamond mining is concentrated in nine countries, with their share in the global production in physical terms as high as 99%.

The world's largest producers of natural diamonds are Russia, the Democratic Republic of Congo (DRC) and Botswana, all together accounting over 60% of the global diamond production.

Top Countries in the Global Diamond Production 2016: 134.1 mln. Carats

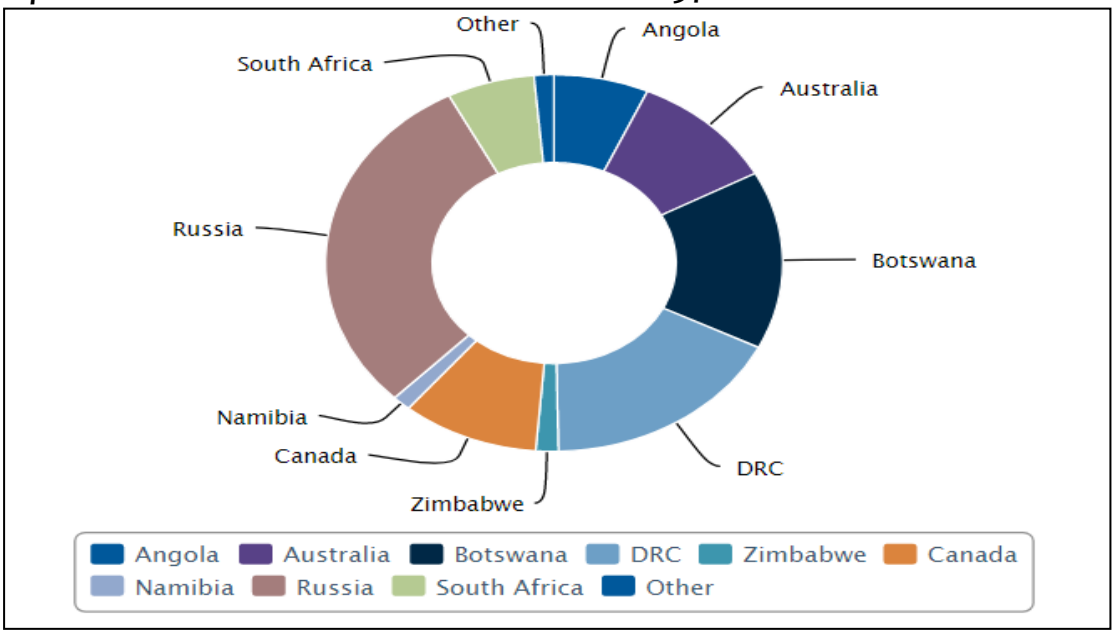


Figure 4. Kimberley Process companies' data Global Diamond Production 2011-16 (thousands carats)

World diamond production based on the costs of produced rough diamonds are dominated by Russia, Botswana and Canada with a combined production of more than 60% of the total worldwide production.

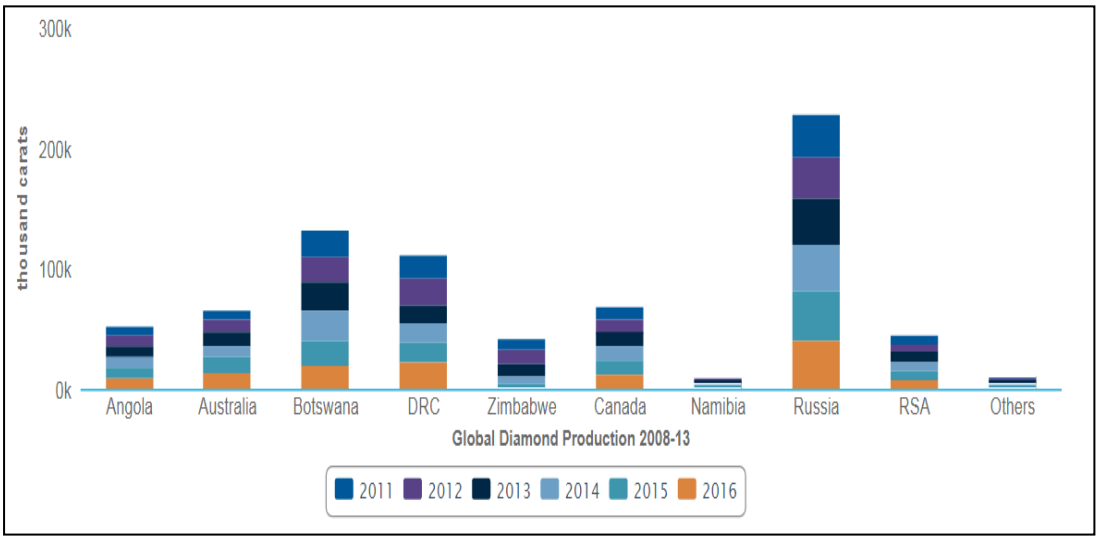


Figure 5. Global Diamond Production 2011-16 (thousands carats) Kimberley Process companies' data

Russia ranks first in the world's diamond production. ALROSA Group accounts for 93% of the total diamond production in the Russian Federation in physical terms, and it is the leader of the global diamond mining industry. Major mining companies are engaged in mining in the main diamond-producing countries, the exception being Zimbabwe and the DRC, where diamond deposits are developed by small companies and prospectors. The graph below represents the geography of the companies' activities including exploration.

Diamond Production by Leading Companies, 2016(* - *including Ekati; Companies' data)*

The world's diamond mining is concentrated in the major primary deposits accounting for about 60% of the global diamond production. The remaining production is concentrated in placer deposits, the principal of them located in the DRC (Mbiji-Mayii) and Zimbabwe (Marange).

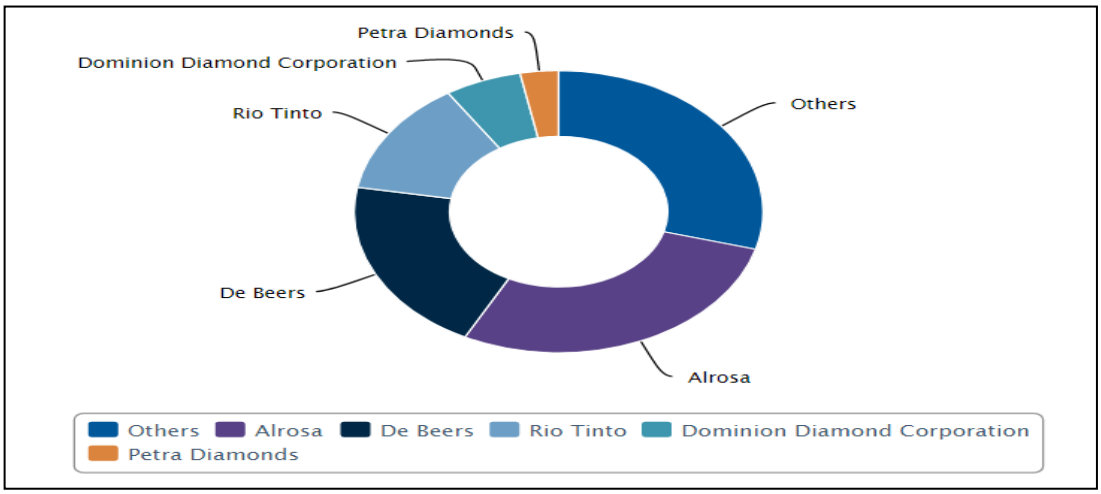


Figure 6. Diamond Production by Leading Companies, 2016(* - including Ekati; Companies' data)

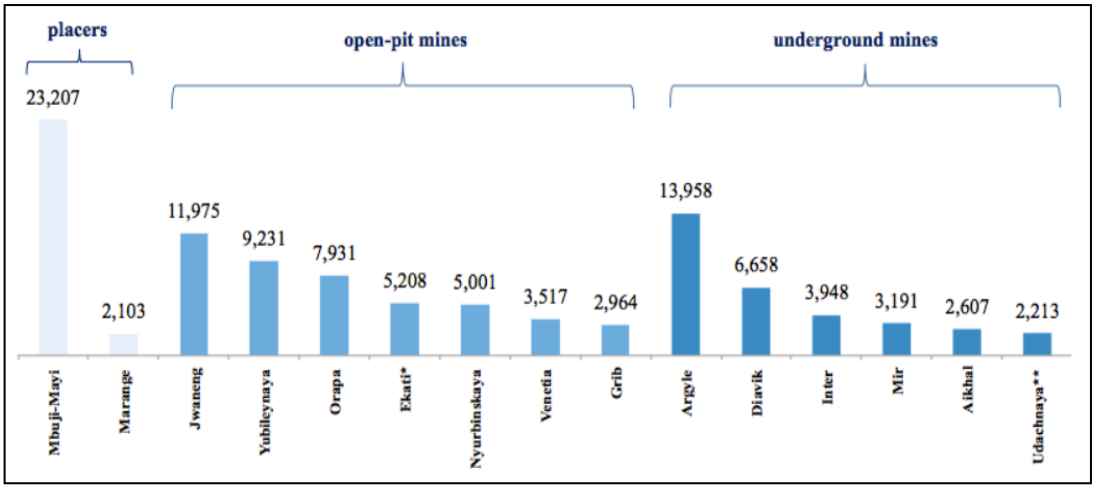


Figure 7. Production Output of the World's Major Diamond Deposits, 2016 (thousand carats) Kimberley Process and companies' data; * - Ekati includes open-pit and underground mining; ** - output, including further development of the open-pit.

By their attributes diamonds from deposits fall into two categories: gem quality and industrial grade diamonds. The former is used in diamond jewellery production, while the latter is used for industrial purposes (manufacture of drills, saws, and abrasive powders). Gem quality rough diamonds are sorted by size, colour, quality and shape, and then are sold to buyers in conformity with the sales policy adopted in a rough diamond production company. Depending on the quality of the mined rough diamonds, the current state of the market, the adopted marketing policy, companies use different approaches to diamond sales: sights, tenders, auctions, spot transactions and long-term contracts.

The world's largest trading centers, which concentrate the bulk of trade in natural rough diamonds, are India, Belgium, the UAE, the USA, Hong Kong and Israel. Being sold from mines, natural rough diamonds arrive at cutting and polishing plants to become polished diamonds that will be used in jewellery making.

(The information above was sourced from the ALROSA website. ALROSA is a world leader in the world diamond mining industry, a Russian partially state-owned diamond mining company)

The Diamond Pipeline

The Diamond Pipeline can be defined as the route the diamond takes from mine to end consumer. The diamond pipeline, typically, comprises**.**

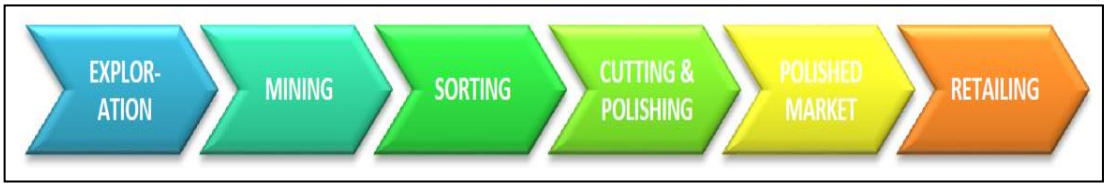


Figure 8. The Diamond Pipeline

Exploration/Prospecting; involves geologists finding diamond deposits in different areas. Prospecting is vital to the future survival of any diamond business as there is a predicted supply-demand gap.

Mining and Recovery; once diamonds have been discovered and surveys shown that it is financially viable to mine them; they are now recovered from the ground. The manner in which they are mined and recovered depends on their source, thus, where they are found.

Sorting and valuing; process of sorting and valuing of diamonds, categorizing them according to size, quality, model and colour.

Cutting and polishing; refers to manufacturing of diamonds; the process of turning rough diamonds into polished.

Polished Market; this is referred to as the 'diamond exchange bourse', a place where diamonds are traded. These are located in some of the world's major diamond manufacturing centres, e.g. Belgium.

Retailing; polished diamonds find their way to Jewellers and Consumers through Wholesalers and Retailers.

International Diamond Market Trends

Although global financial stability has proven quite volatile over the past 4-5 years, the diamond industry appears to have stabilised somewhat, with moderate increases in diamond prices forecast for the immediate future.

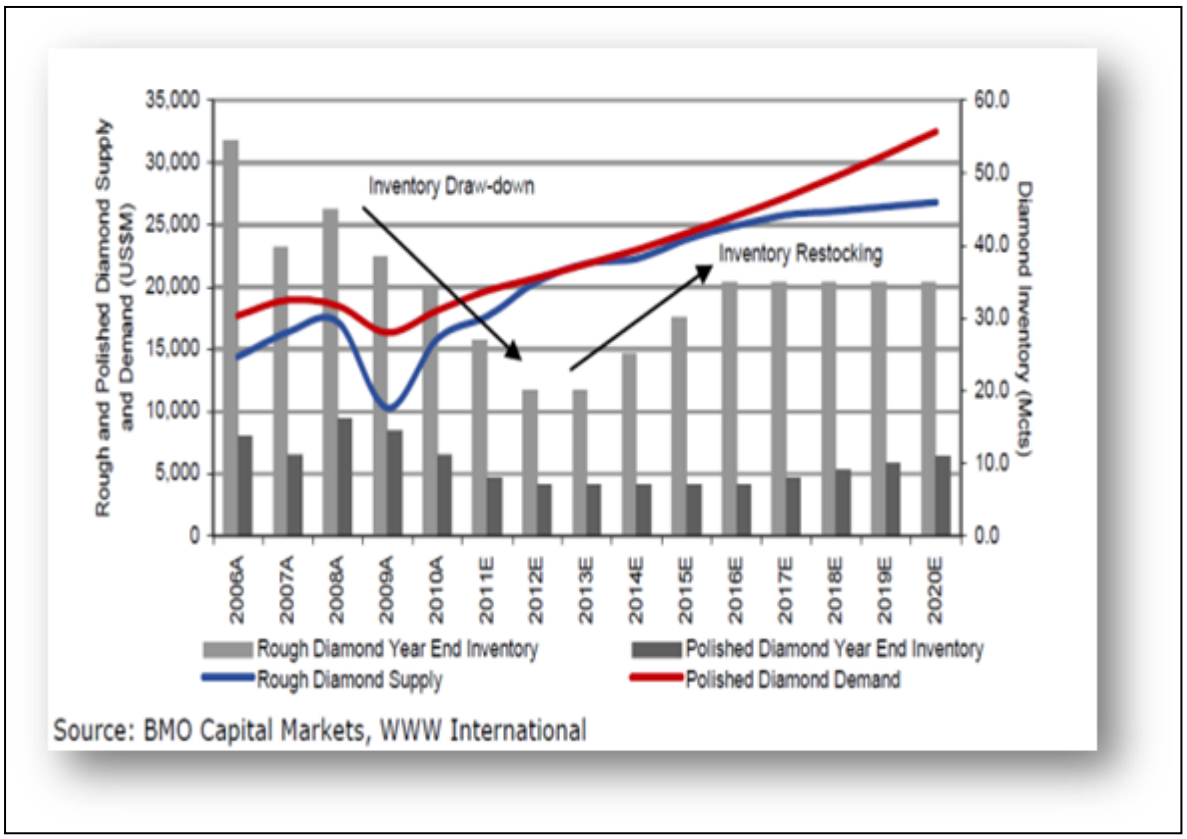


Figure 9. Inventory movements support diamond prices(USDM, Mct)

BMO Capital Markets (Sterck, 2011) estimated at the time that Chinese demand for polished diamonds accounted for 5% or USD1 billion of the market in 2010. While this

represents a relatively small proportion of the market currently, growth is extremely strong.

De Beers reported that Chinese demand for polished diamonds grew at 25% in 2010, significantly ahead of GDP growth of 13%. Looking ahead, momentum into 2011 suggests that growth of 15% may be possible. From 2012 onwards, growth in household disposable income is forecast to average 11% to 12% per annum. This translates into minimum growth in diamond demand of 13% per annum.

From 2012 onwards diamond demand is likely to grow in line with economic growth at around 10% per annum. Combining steady demand growth from the established diamond consuming nations and strong growth in demand from emerging consumer's results in a forecast of polished diamond demand almost doubling by 2020, resulting in a total market value of over USD30 billion in nominal terms.

Desirability:

No	Description	Yes/No
1	Does the proposed land use / development fit the surrounding area?	Yes
2	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	Yes
3	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	Yes
4	Will the proposed land use / development impact on the sense of place?	Yes
5	Will the proposed land use / development set a precedent?	No
6	Will any person's rights be affected by the proposed land use / development?	Yes
7	Will the proposed land use / development compromise the "urban edge"?	No

Benefits:

No	Description	Yes/No
1	Will the land use / development have any benefits for society in general?	Yes
2	Will the land use / development have any benefits for the local communities where it will be located?	Yes

g) Period for which the environmental authorisation is required

When the production rate and available resources of the mine is taken into account the life of mine is expected to be 16 years.

h) Description of the process followed to reach the proposed preferred site

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

The mine was previously owned by Trans-Hex and Porta Diamonds. Mafisa Mining (Pty) Ltd is the holder of a mining right on this site and as this is for the application of a mining right renewal no other sites are considered. The proposed site plan is based on the location of the existing infrastructure on the site as well as the availability of alluvial diamonds as determined by the geology on the site.

i) Details of all alternatives considered

With reference to the site plan provided as Appendix 4 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 registered description of the land to which the mining right application relates:

Property:	A Portion (442.7358 ha) of Portion 5 of the Farm Kammagas No. 200
District:	Namaqualand
Province:	Northern Cape
Extent:	442.7358 ha

Alternatives considered: -

No planned alternative to proposed mining is envisaged. Should mining not proceed the current agricultural land use will continue. Proposed site layout and opencast mining with concurrent rehabilitation where possible will minimise footprint and impact. Any alternative methodology may have greater impact. Alternatives may be looked at in more detail within the Scoping, EIA EMP Report.

The only other alternative would be not to continue with the operation.

(b) The type of activity to be undertaken:

The planned mining technique is that of a typical South African opencast block alluvial diamond operation. The planned mining method is Opencast mining process with oversize material from the gravel scalping and the tailings from the plant, being used as backfill material prior to final rehabilitation. Gravels are excavated, loaded and transported to the nearby treatment facility using articulated dump trucks.

Alternatives considered: -

The mining blocks is within the target area known to carry diamonds and therefor no alternative to the application area can be considered. The only alternative land use on the area that will be selected for the processing plant is grazing however, the applicant's main economic activity is mining and for this reason does not favour any other alternative land use.

(c) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating mining project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for bulk sampling as well as limited additional impact on the environmental (non-perennial drainage lines and wind direction), heritage resources and discussions with the relevant Departments.

The following infrastructure will be established and will be associated with the prospecting operation:

- Processing Plant: 1 X 16 feet
- Ablution Facilities: In terms of sewage the decision was made to use septic tanks which can be serviced regularly by the service provider.
- Clean & Dirty water system: Berms
  It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the mining site.
- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
  It is anticipated that the operation will utilize 2 x 23 000 litre diesel tanks. This tank must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tank. A concrete floor must be established where the re-fuelling will take place.
- Mining Area: Area applied for is an open cast mining process with oversize material from the gravel scalping and the tailings from the plant, being used as backfill material prior to final rehabilitation.
- Processing plant: At the plant the diamondiferous gravel will be sorted by means of a grizzly screen grid and all material larger than 100 mm will be separated from the rest. This material will be used in the backfilling stage.
- Roads (both access and haulage road on the mine site):
  Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the mining operation will create an additional 1.5 km of roads, with a width of 8 meters where no reserve exists and where the reserve exists 15 meters. The current access road is deemed adequate for a service road into the mining site.
- Salvage yard (Storage and laydown area).
- Product Stockpile area.
- Waste disposal site
  The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:

- Small amounts of low-level hazardous waste in suitable receptacles;
- Domestic waste;
- Industrial waste.

- Temporary Workshop Facilities and Wash bay.
- Water distribution Pipeline.
- Water tank: It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

Alternatives considered: -

Alternatives for fuel storage include surface storage, underground storage and the storage of fuel in mobile tanks with a metal bund wall. Underground storage has an adverse negative pollution potential because it is not easy to monitor leakages. Remediation measures are also not as effective as compared to surface storage tanks. Mobile tanks are viable option for infield screening activities, but the best viable long terms option is the instalment of fuel tanks within a concrete bund wall. The final location of the fuel storage tanks will be determined based on proximity to mining operations.

In terms of water use alternatives; the operation is located next to the Buffels River which is a perennial river which may be a source of water for the operation. Plastic pipelines are considered to be the best long-term option for transferring water, due to their temporary nature which causes minimum environmental disturbances.

A diamond rotary plant will be established (1 X 16 feet rotary pan). Water use for a 16 feet rotary pan is in the order of 18000 litres per hour. The operation will only work in daytime hours which will constitute about 8 hours per day which will bring water consumption to 144000 litres per day and 720 000 litres per week 2880000 litres per month per pan. A 16 feet pan can on capacity work about 65 tons per hour which constitutes about 117m³ per hour.

A pipeline route will be designed based on the principle of minimum impacts to the environment.
The locality of the mine residue dam will be selected based on the following considerations, this dam will be very small due to the limited material being processed and the limited water needed:

- The locality is already disturbed or mined out.
- It is within reach of (1 000m) of the treatment plant.
- It is situated near the access road to the mining activities.
- No underlying ore bodies or geological discontinuities.
- No geomorphological impacts.

- No structures, dwellings or other points of risk on down-stream side.
- Convenient material nearby for construction of dam.
- Top soil from the treatment process will be available for final rehabilitation.

A standard slimes dam design will be established in order to maximise the capacity of the slimes dam and to minimise the risks in terms of general safety and the DWS regulation.

In terms of power generation, the options available was for Generators or ESKOM power. The infrastructure area will use electricity provided by ESKOM via a 1 kV overhead line, but the infield wash plants will make use of portable generators.

In terms of sewage the decision was made to use septic tanks.

(d) The technology to be used in the activity:

- Technique

  Production will commence immediately at start-up as mining is to take place as a continuation of earlier surface mining and briefly entails:

  Year Production Build-up

  - the removal of overburden above the diamond bearing gravels and clays by excavator and dozer to expose the gravels and diamondiferous clays which overlie the bedrock;
  - removal of the diamondiferous clays and gravels which will be sent to the plant for processing and diamond recovery; and
  - the sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing.

  Although production can be at full scale at start up provision is made for a reduced production rate during the first 3 years to allow for upgrading and maintenance of infrastructure due to the fact that the mine was not operational fulltime and vandalism by illegal diggers did take place.

  As part of the construction phase a site perimeter fence around the Project Area will be required for safety and security purposes due to the existing problem with illegal miners. Control measures needs to be put in place as part of future mining operations to restrict and perturb persons from any unauthorised access.

  As can be seen production for the first two years is estimated at 50% of full production and 75% for the third year. Production will increase from 15350Mt in year 1 to 30700Mt in year 4. The production will thereafter stay constant and can only be increased by introducing additional wash plants to increase processing.

  The channel gravels to be mined last is still regarded as Inferred Resources as the gravel was partly drilled, but not sufficiently to be classified as indicated. The outline of the channel was drilled sufficiently to clearly identify its extent within the mining area, but its consistency is not yet proven satisfactory therefore a decline in production is forecast during the last two years.

Basic overview of the mining method

Mining is to take place as a continuation of earlier surface mining and briefly entails;

- the removal of overburden above the diamond bearing gravels and clays by excavator and dozer to expose the gravels and diamondiferous clays which overlie the bedrock;
- removal of the diamondiferous clays and gravels which will be sent to the plant for processing and diamond recovery; and
- the sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing.

Use will be made of open cast mining methods. Due to the ore types and geological setting of the gravel beds, short mining walls will dramatically increase the cost of mining, mainly because of the instantaneous stripping ratio of ore to waste, which is 15:1 on average. As part of security measures, the gravel bed should only be exposed in the area where mining is taking place at any point in time; the rest should be protected by sidewall sliding to cover the exposed faces.

The proven reserves (Watergat Area and Blocks T2 Diagram 5) will be mined first and the reason behind this is:

- To create a slot into the paleochannel from where long wall mining can continue
- To remove terrace gravels in order to unlock more paleo gravels.
- These blocks are situated closest to the current plant site at watergat

The next stage will incolve mining of block C1 from where long wall mining will continue to block C2 to C6. Prelimanary planning is to move then to the proven reserves (Areas T1, T3 & T4 Figure 5) followed by mining the rest of the paleo channel block C7 and C8. Depending on grade the final stage would be mining of the terrace gravels block T5 still regarded as an inferred resources.

The gravel will be mined by means of strip mining on long benches. The solidified sands (overburden horizon) will be removed in with three benches, each with a BW of 5m and BH of 13m (Figure 5 and 6). This leaves an bech slope angle of 60° for the benches and a overall slope angle of 80° to prevent rockfalls when becoming unstable for unforeseen reasons. In such a case the result will be a sliding of the face, which is preferable. Once mining is completed at the end of the life of mine, this slope will make rehabilitation easy, as only final high wall sliding will need to be done.

Indicated resources will be mined together with the proven reserves and the inferred resources will be investigated as a last option for mining. Shallow paleo channels also exist on the northern and western portions of the mining area (Areas 5 Figure 5) and these areas needs to be worked by hand. This will be done by small miners from the local community in partnership with the company under cover of this mining right and EA.

In the center of the mine pit there is also an area where the bedrock still needs to be swept (Areas 4 Figure 5) and this will also be done by small miners from the local community in partnership with the company

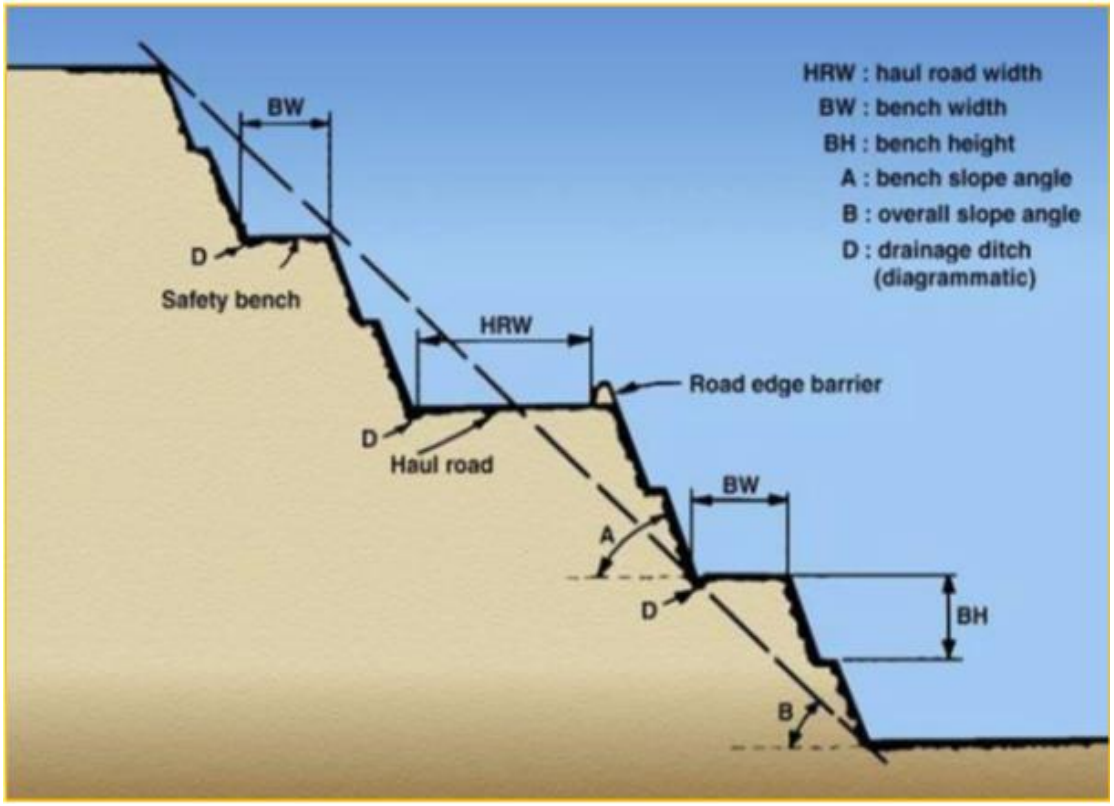


Figure 5. Schematic diagram of mine benches at high walls

Figure 6: General shape of Open Pit Mine at end of operations

Soil Utilisation Guide

Topsoil

The upper windblown sand cover comprises a 10 – 50cm thick layer of loose windblown sand with humus and grass seed in its upper 10 cm that is considered as topsoil. A layer of topsoil ±50cm thick will be removed from the new mining blocks. Only 50% of the topsoil recovered will be stockpiled for rehabilitation of the new mining blocks and the rest will be used to cover the existing mined-out sections on a continuous basis as stripping is taking place. will be replaced on the mined-out sections.

The topsoil stockpiles for rehabilitation of the new mining blocks will be placed within the mine pit and no new stockpiles will be created above natural ground level. The topsoil overlies a more cohesive medium grained red Kalahari sand that can be anything from 1 to 30 meters thick regarded as overburden and will be removed.

Overburden

Overburden handling will generally occur along the principles of a cut & fill strip mining operation where the removed overburden is used immediately in the backfill of previously mined cuts. No overburden will be dumped on natural ground level.

Coarse tailings

The top layer of gravel is bulldozed onto stockpiles from which it is loaded into Articulated Dump Trucks (ADT's) either by excavator or front-end loader for transport.
The remaining 1-1.5 m of gravel is then removed from the uneven calcrete substrate by means of an excavator. Care is taken to ensure the sterile excavation of the gravels such that no contamination by the footwall lithologies occurs.
Excavation continues to the base of the gravels where higher basal grades are expected to occur.
Where the bedrock is soft, approximately 20cm of bedrock is excavated with the gravels, so that any diamonds in the weathered rock will be recovered.
The primary gravels are subjected to infield screening to -35mm by means of a mobile screening plant (Figure 7). The screened material (ore) is then transported by ADT's to the diamond processing area where it is stored on the ore stockpile to be processed.

- Technology

Applicable to the extraction and preparation of the mineral to comply with market requirements.

High level description of the processing plant
Basic plant design

The plant flowsheet (Figure 8) incorporates a conventional three stage process where the primary gravels screened material (ore) is transported by ADT's to the diamond processing area where it is stored on the ore stockpile to be processed by means of a 16ft-rotating wash plant. The liberation process ROM is approximately 200tph and pan-feed 80tph. The concentrate on average 10% of panfeed is then transported in bins to the final recovery area for final recovery of diamonds by means of a pleitz jig. About 1% of the concentrate make it to the sorting tables for hand sorting.

Mineral processing
Material from ore stockpile is fed into the trommel screen feed bin using a front-end loader. The material is combined with water introduced into the scrubber from the clear water return dam. The discharge of the scrubber is directly into the trommel screen which scalps the material at ±35 mm.
All oversize material is transported via a conveyor to a temporary stockpile from where it will be used to backfill excavations. Oversize can also be sorted before backfilling to be sold as pebbles for garden decorations. Material 2.5-35 mm is transported to the pan's rotary distributor via a conveyor belt equipped with a weightometer used to record the feed tonnage to the pan, panfeed on average 80tph.

Undersize material and slurry from the trommel screen are pumped to a separator cyclone situated above the pan tailings bin. The cyclone underflow discharges directly into the bin whilst the cyclone overflow discharges into a sump, which is then pumped to an agitated pulp header tank situated above the pan. Pulp from the header tank is introduced into the rotary distributor where it is combined with the feed material and discharged directly into the pan.
The tailings from the pan (overflow) discharges continually onto an individual dewatering screen, coarse residue (CR) discharges onto common transfer conveyor and the screen undersize and slurry (FR) reports to a central sump. The slurry is pumped to a dewatering cyclone and dry slimes discharges to the mine FRD within the excavation. The CR tailings are transported via conveyor belt to the pan tailings bin where it is combined with the separator cyclone underflow; this material is then dumped into the relevant open excavations as part of the on-going rehabilitation process.
The concentrate from the pan is collected in a concentrate bin and moved to the final recovery area where final concentration takes place by means of pleitz jigs before it is moved to the sorting tables for final sorting by hand.

Alternatives considered: -

The planned mining activities include with an excavator up to bedrock. The operation is also associated with processing techniques that make use of modern technologies. These are the most economic viable method currently being used by the diamond fraternity. There is no other feasible, alternative mining method for the bulk sampling of possible alluvial diamonds.

(e) The operational aspects of the activity:

The gravels will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the run of mine gravels will be fed onto a grizzly for screening out oversize material. The material will be processed through a screening section for delivery to a recovery plant. Concentrate from the recovery plant will be processed through an X-Ray/Sortex plant to extract the diamonds. An area will be used for all processing and dumping operations. The expected lifespan of the mine is 16 years.

Mining activities will primarily make use of existing roads created by previous mining activities, but there is a possibility for additional roads that could be created.

Alternatives considered: -

The conventional opencast load-haul-mine method has been proven to be the most economic viable method currently being used by the diamond fraternity. There is no other feasible, alternative mine method for the mining and extraction of possible general and alluvial diamonds.

(f) The option of not implementing the activity:

Potential land use includes grazing and mining. The majority of the area is classified to have potential for grazing land. Therefore, mining activities are believed to be the most

economically beneficial option for the area to establish any potential for mineral resources.

Socio-Economy

The operation will make provision for 15 to 35 job opportunities. This will be lost if the mining project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

There are some parts of the application area that is covered by vegetation, a specialist biodiversity study will be done on the area to establish if any of the flora or fauna is protected.

Heritage and Cultural Resources

No information is available on any heritage features on the area of application. Due to the various mining activities which took place on the application area the probability of finding any heritage and cultural resources.

Should any other heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. If the mining operation is approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.

ii) Details of the Public Participation Process Followed

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

(a) The consultation process with interested and affected parties (neighbouring farmers and land owners) has been done with personal visits. A copy of the Scoping Report with a cover letter as well as a comments form was hand delivered to the owners.

(b) Records will be kept of the complaints and the mitigatory measures have already been implemented.

(d) Correspondence of the proposed Mining Right application has been forwarded per registered post on 07 June 2021 to all identified interested and affected parties. This correspondence contained a copy of the Scoping Report with a cover letter and comments form.

(e) The process as described by NEMA for Environmental Authorization was followed. See table below for the identification of Interested and affected Parties to be consulted with. The landowner, and or occupants and direct neighbours

were consulted personally and through a letter that was given to them with registered post. Notices will be placed at the Springbok Library, in Springbok, at the Municipal Offices of the Nama Khoi Local Municipality, on the road to Komaggas, on the gravel road towards the mining area and at the entrance to the mine. With this site notice all passers-by are requested to submit any written comments to be forwarded to the consultant.

(f) An Advert (Notice) will be placed in the Springbok newspaper to notify all other interested parties and affected parties of the application for a mining right and to invite any person that might be interested and or affected to register.

iii) Summary of issues raised by I&APs

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

Table 3: Summary of issues raised by I & AP's

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	***Date Comments Received***	***Issues raised***	***EAPs response to issues as mandated by the applicant***	***Consultation Status (consensus dispute, not finalised, etc.)***
AFFECTED PARTIES				
Landowner/s X				
The Gemeenskap of Komaggas				
Lawful occupier/s of the land				
Rightersveld Growers Mr. Mike Rice beauvallonfarm@gmail.com	***Letter and Scoping Report was send via email on 7 June 2021***			
Landowners or lawful occupiers on adjacent properties				
Municipal councillor X				
Municipality X				
Nama Khoi Municipality P.O. Box 17 Springbok 8240	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Namaqualand District Council Private Bag X20 Springbok 8240	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			

Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e				
ESKOM SOC Limited NC Land Development Operating Unit P O Box 606 Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Eskom Environmental Division PO Box 356 Bloemfontein 9300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
SANRAL P O Box 415 Pretoria 0001	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Transnet PO Box 72501 Parkview 2122	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Communities				
No communities				
Dept. Land Affairs				
Department of Rural Development and Land Reform PO Box 5026 Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Department of Land Affairs and Rural Development Private Bag X 5018 Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Department of Agriculture & Land Reform, Rural Development	***Registered letters and a copy of the Scoping***			

Private Bag X5018 Kimberley 8300	***Report was sent on 7 June 2021***			
Traditional Leaders				
No Traditional Leaders				
Other Competent Authorities affected				
Department of Mineral Resources and Energy Private Bag X6093 Kimberley 8300	***Letter and a copy of the Scoping Report was sent on 7 June 2021***			
Department of Cooperative Governance, Human Settlements and Traditional Affairs Head of Department Private Bag X5005 Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Department of Environment & Nature Conservation Private Bag X6102 Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Department of Agriculture, Forestry & Fisheries P O Box 2782 Upington 8800	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
Department of Water & Sanitation NC Private Bag X6101 Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
National Department of Public Works Private Bag X5002 Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			

Northern Cape Department of Roads and Public Works Head of Department PO Box 3132 Squarehill Park Kimberley 8300	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
South African Heritage Resource Agency PO Box 4637 Cape Town 8000	***Registered letters and a copy of the Scoping Report was sent on 7 June 2021***			
OTHER AFFECTED PARTIES				
INTERESTED PARTIES				

iv) The Environmental attributes associated with the sites

(1) Baseline Environment

(a) Type of Environment affected by the proposed activity
(its current geographical, physical, biological, socio-economic, and cultural character).

1.1 Geology

Sediments of the Namaqualand coastal area overlie the Precambrian Metamorphic Basement Complex, which consists predominantly of granite-gneiss, sparsely interspersed with minor mafic intrusive, and often intersected by quartzite ridges, marble layers and a wide variety of schists (De Villiers & Söhnge, 1959).

The oldest known unmetamorphosed sediments in this area are the Cretaceous silcretes and remaining patches of silicified diamond conglomerate of Late Cretaceous age (~70 m.y.), found on Annex-Kleinsee. The Buffels River palaeo-channel gravels were mainly deposited during wetter climates of Tertiary age, while the raised beach terraces mined on the coastal farms were formed during sea level stillstands since the Late Miocene and throughout the Quaternary period (Kensley & Pether, 1986).

Lower Buffels River alluvium is spread across an extensive coastal floodplain, ~40km long from east to west and up to 10km wide, flanking the river on both sides. The palaeo-channel deposits are interpreted as derived from a widely meandering palaeo-river, with deltaic distribution towards the river mouth. The coastal plain is covered by reddish wind-blown sandy overburden, in which calcrete/kaolin crusts often precipitate.

From their kimberlite sources, diamonds are transported across the landscape by the actions of wind, water and ice (glaciers) under the constant influence of gravity. Diamonds, by far the hardest naturally occurring substance, are able to withstand transportation over thousands of kilometres during many millions of years. Due to high density, diamonds tend to concentrate gravitationally and hydrodynamically. These factors cause diamonds to travel and be deposited together for the most part, resulting in the well-known "jackpot" phenomenon, which is mainly dependent on bedrock morphology. Softer patches in the bedrock thus form potholes and boulder pits. Diamondiferous gravels are generally only moved during storm and flood conditions, when energy levels rise to more than ten times average.

During floods, boulders and cobbles are moved into bedrock depressions which act as trap sites, where they accumulate to form boulder beds, able to withstand further movement. Once deposited, the boulder beds lie in stable, densely packed (clast-supported) configurations, and in turn act as trap sites for large amounts of pebble-sized gravel infill. Diamond concentrations are protected against remobilization by overlying gravel

and boulder lags, as well as by calcrete, ferricrete, silcrete and gypsum cementation.
The Buffelsbank Mine is situated on the western boundary of the so-called Copper District that comprises an area of roughly 3 000 km². It's a highly dissected mountainous area lying at a general elevation of 900 m, rising in places to 1 200 m. Rocky outcrops are abundant, the alluvium covered parts being confined to the low-lying areas between the mountains.

The Copper District is underlain by rocks of Proterozoic age that have undergone high-grade metamorphism and polyphase deformation. Lithostratigraphically the rocks can be sub-divided into a Metavolcanosedimentary succession which has been intruded by various granites and granite gneisses in a sheet-like fashion at different stages relative to the structural and metaitiorphic events.

The regional geology of the area is characterised by metasediments (pelitic gneiss, amphibolite, gray biotite gneiss, calc-silicate gneiss, marble and thin lenses of quartzite) of Mokolian age. The ancestral Buffels River and related systems exhibit a complex geological history with the first economically significant occurrence of diamonds relating to palaeo-drainage evolving in the Early to Middle Cretaceous (120-100Ma). Re-use of these fluvial conduits has occurred during the Late Miocene (Proto deposits) and again in the Plio-Pleistocene and Quaternary eras (Meso deposits), culminating in the modern Buffels River. These later Buffels events exploited the 'median' channel of this remnant drainage basin, which now represents an entrenched transverse (east west trending) master stream consequent. In each case, previous valley fills have been exhumed and replaced by successive cycles of aggradation and degradation, resulting in stepped terraces of remnant older (higher elevation) Cretaceous and younger Miocene deposits (middle elevation) that are blanketed in Meso gravel bars (lowest elevation). The entrenched modern river represents the last Meso phase (of 3 recognisable phases) and is 6-8m below a set of distinctive paired terraces (second Meso phase) fringing the modern river valley.

In each instance, the base of these successive fills is floored by a basal unconformity upon which lies a fining upwards sequence of gravels, grits and coarse sands of varying maturity, terminating in an aggradational valley-flooding sequence of silts and clays. Terrigenous deposits that commonly contain hardpan layers (calcrete, ferricrete) blanket the top of the fluvial sequence. A ubiquitous indurated aeolian sand (Dorbank) layer, overlain by ilmenite-rich aeolian sand sheets and transgressive dune corridors, comprise the final sedimentary succession.

Site specific geology

The present course of the Buffels River forms the Buffelsbank northern boundary. However, during previous geological ages, the palaeo-Buffels River meandered freely across the width of the Buffels River Valley. It is evident from the placement of the primary boulder and cobble gravel

deposits, that during the main depositional phase of the palaeo-Buffels River, it followed a meander across Buffelsbank mining area.

It is clear from historic excavations that the palaeo-Buffels River exerted tremendous energy over a considerable period of time to transport and deposit immense boulder-beds. The boulders, cobbles and pebbles generally consist of Nama quartzite, but also of quartzose granite-gneiss from the Namaqualand Metamorphic Mountainland. The pebble fraction also includes vein quartz.

The modern-day Lower Buffels River Valley is a mature valley with a low slope of approximately 1:100, and part of the coastal floodplain between the Mountainland and the West Coast. However, during evolution of the floodplain in very wet climates, the coastward edge of the receding Mountainland formed an S-shaped curve with slopes as high as 1:20, which greatly facilitated the downslope movement of large boulders.

It is generally accepted that all the older tributaries draining the Mountain land and entering the Buffels River Valley contributed diamondiferous gravel derived from older glacial deposits. The general trend of the regional foliation of the basement gneiss to a large extent controls the direction of mafic lineaments forming within it. Bedrock in the area consists of a series of schist's and granite gneisses of the Namaqualand Metamorphic Complex covered by sands, calcretes and dorbank. The diamonds in this alluvial deposit are found both in the basal lag of the palaeo channels and in potholes scoured into the softer schist bands. The palaeo channels in these deeper plunge pool environments are sealed by sandstone and elsewhere by cemented sands, dorbank and calcrete.

The gravels (0.1 to 1.0 m thick) are invariably white quarts pebbles and cobbles with a sprinkling of larger boulders. Smokey quartz is common. The gravels vary from loose cemented to very hard conglomerate.
The diamond deposit at Buffelsbank mine is the in-situ remnant of the basal layer of a succession of fluvial gravels, sands and clays of a paleo braided river course. Due to the above the alluvial diamonds occur within various horizons, i.e;

- Pothole structures within the gneissic bedrock and in crevasses
- The basal clay horizon, which overlies much of the deposit's paleo bedrock.
- The upper gravel horizon, which directly overlies the basal clays

In general, these diamondiferous horizons are found on and within 3 to 4 meters above the basal gneissic floor and are covered by clayey sand and sand overburden of between 1 and 35m thick. While the deposit is a remnant terrace with a broad (± 1-2 km wide) braided streambed floor, the presence of a thicker "main channel" (basal gravel channel) has been verified. While the bedrock gneiss extends as an undulating paleo river valley floor, the extension of the remnant paleo gravel reserves beyond the lease area boundary is not known in the south and has been eroded away in the north. There are no dykes, sills or faults evident in the mine floor.

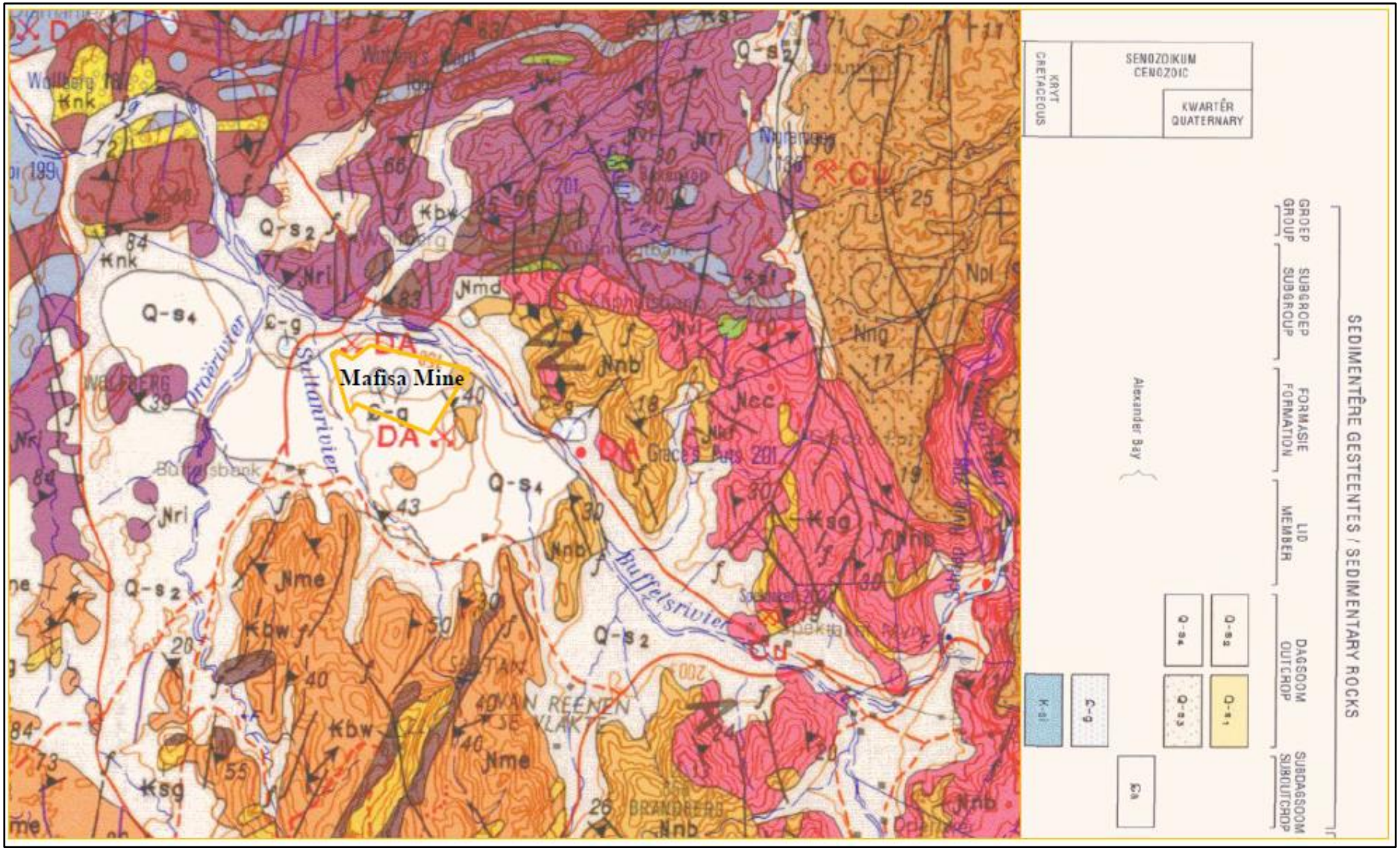


Figure 10. Lithology and geological map of study area.

1.2 Climate

The site falls within the west coast desert climatic zone of Southern Africa, which is typified by hot dry summers and cooler winters with little rain. The nearest town to the mining site is Springbok. Springbok lies on 982m above sea level Springbok's climate is a local steppe climate. There is not much rainfall in Springbok all year long. According to Köppen and Geiger, this climate is classified as BSk.

Average temperatures measured for Springbok ranges from 22.3 °C in the hottest month, February, to 11.4 °C for the coldest month, July. The average temperatures measured for all of the months can be seen in the table below.

Table 4: Average temperatures and rainfall measured for every month.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	22	22.3	21.4	18.1	14.6	11.9	11.4	12	14.3	16.7	19.3	20.8
Min. Temperature (°C)	14.7	15.1	14.6	11.6	8.4	6.4	5.8	5.9	7.6	9.7	12	13.5
Max. Temperature (°C)	29.4	29.6	28.3	24.7	20.8	17.4	17	18.1	21.1	23.7	26.7	28.2
Avg. Temperature (°F)	71.6	72.1	70.5	64.6	58.3	53.4	52.5	53.6	57.7	62.1	66.7	69.4
Min. Temperature (°F)	58.5	59.2	58.3	52.9	47.1	43.5	42.4	42.6	45.7	49.5	53.6	56.3
Max. Temperature (°F)	84.9	85.3	82.9	76.5	69.4	63.3	62.6	64.6	70.0	74.7	80.1	82.8
Precipitation / Rainfall (mm)	4	6	11	19	25	32	30	27	12	12	5	6

Rainfall

The rainfall in the area is low. The two closest station is in Springbok which is 50km away. The annual rainfall in Springbok is around 189 mm. The daily rainfall data for Springbok have been summarized to represent the average monthly rainfall, which is graphically presented in Figure 11 below.

Precipitation for the region is the lowest in January with an average rainfall of 4 mm during this month. During the month of June, the precipitation reaches a peak with an average of 32 mm. The difference in precipitation between the driest and wettest months is thus 28 mm.

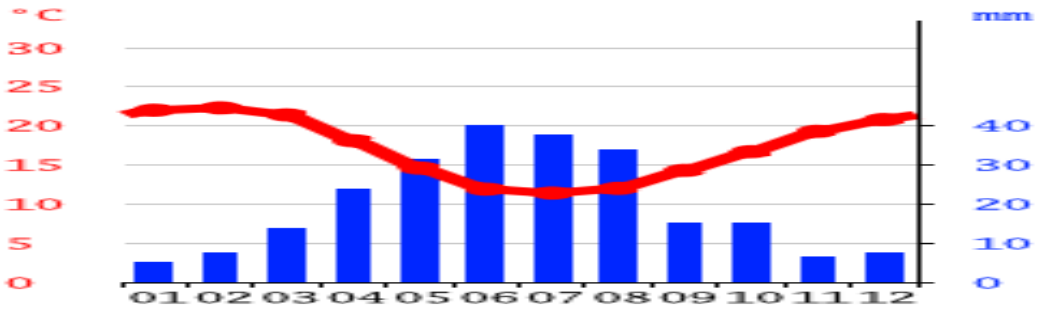


Figure 11. Average rainfall and temperature per month at the nearest rainfall station (Springbok).

Evaporation

Evaporation far exceeds rainfall at the site. Although no records are available from the mine site the gross annual evaporation rate at Springbok is on average 3254 mm.

Wind

There is little or no information available on the wind patterns in this area. The prevailing winds blow from WSW in the summers and ENE in the winters and can reach high speeds. The winds are unfortunately associated with dry conditions and as such will generate high levels of windblown dust in the absence of effective attenuation measures. Daily wind patterns are normally very light NE in the morning switching to SW in the afternoon, with a high percentage of calms in 3 of the 4 seasons.

Incidents of Extreme Weather Conditions

The area is not generally subjected to extreme weather conditions in the form of hail, frost or thunderstorms, although high temperatures associated with strong winds especially in the afternoons from the south do occur.

1.3 Topography

The topography of the undisturbed area is flat and undulated with a gradual slope towards the north into the Buffels River on the mine site. The site previously formed part of a gentle north-facing slope of the Buffels River between the elevations of the 145 m and 210 m contour lines above mean sea level (amsl).

1.4 Soils

Soil Types

Due to the extend of previous mining activities on the site only two soil types are identified namely the Dundee/Fernwood/Sandveld soils and Veggat.

Type, erodability and depth of topsoil

Given the extent of mining disturbance only two areas of in-situ soils remain namely the:

- **Dundee/Fernwood/Sandveld soils** of the southern expansion area: The upper 10 cm sandy soil contains some humus and grass seed and will be handled as topsoil. Given the high sand content of this material as well as the lack of vegetation cover, this material is very susceptible to erosion (particularly wind erosion) and gulley erosion in areas where stormwater is allowed to concentrate.

- **Veggat area (variable Dundee layered gravels and other transported soils):**
  In the Veggat area the soils are more stable, but within the eroded braided channel deposits the soil and alluvial subsoils are extremely variable in-depth composition and erodibility. In that area they may vary from clays through sand to pebble deposits of varying depth on an undulating bedrock horizon which shows no weathering.

Composition, erodability and depth of subsoil in the upper Southern extension areas.

The subsoil (the overburden in this case) consists of various layers of sand and clayey sand/silt up to 35 m in depth. The subsoil shows a propensity to erode when stockpiled without adequate run-off control rehabilitation as shown by the clearly visible gulley erosion in the overburden waste heaps on the slopes of the rounded overburden dumps. Suitable ripping of the 1:2 overburden slopes prior to topsoiling to form a good key for topsoil on the slope will therefore be a strict requirement of rehabilitation of the southern advance final overburden slopes.

1.5 Pre-mining Land Capability

As a result of a combination of the climate; non-rich soils; the topography of the area; and the distance to the nearest surface water, the land lends itself to an activity such as livestock farming. The area was used in the past, before mining, for nomadic goat grazing by the locals.

As the undisturbed area is unsuitable for grazing due to its low carrying capacity, it rather accounts for wilderness land, together with the wetland, or river bed.

LAND CAPABILITY	AREA (ha)	PERSENTAGE (%)	REMARKS
Arable Land	0	0,0%	Insufficient rainfall for dry-land cropping
Grazing Land	*203		Carrying Capacity is very low, 12ha/ssu and should rather classify as wilderness
Wetland/River Area	**22		Part of Wilderness Area
Wilderness Area	225	50,3%	
Disturbed Area	222	49,7%	Previous Mining
Total	447	100%	

As the undisturbed area is unsuitable for grazing due to its low carrying capacity, it rather accounts for wilderness land, together with the wetland, or river bed.

1.6 Land Use

Land Use Prior to Mining

Prior to the first mining activities the area was used for nomadic goat grazing by local inhabitants.

Before this application the area was mined by Trans Hex and Porta Diamonds as an opencast alluvial diamond mine. The current status of the area is largely due to their activities.

Historical Agricultural Activities

Prior to the first mining activities the area was used for nomadic grazing.

Evidence of Abuse

Mining took place in the past, leaving the area in its current status. Present misuse is in the form of illegal diamond mining by under-digging of the mine sidewalls in the gravel zone, creating extremely dangerous situations because caving can take place, burying the culprits.

Existing Structures

Existing structures on the mine site includes infrastructure from previous mining activities.
Workshops and offices left by Trans Hex
Ex Trans Hex Plant
Power lines

1.7 Natural Fauna

The Great Karoo used to support a large variety of antelope (particularly the springbok), the quagga and other large game, especially on the grassy flats in the east. Francois Le Vaillant, the famous French explorer, naturalist and ornithologist, who traveled through the Great Karoo in the 1780s, killed a hippopotamus in the Great Fish River in the Karoo (and ate its foot for breakfast). He also recorded that he saw the spoor of a rhinoceros near Cranemere, in the Camdeboo Plains (eastern Lower Karoo). Elephant tusks have been found by farmers in the Camdeboo district, but there are no records of any having been seen alive in that region. The quagga roamed the Karoo in great numbers together with wildebeest and ostriches, who always seemed to accompany them. These quagga seemed gentle and easy to domesticate. (A pair of quagga was used to draw a horse-carriage through London, more for curiosity than for any superiority the quagga might have had over a horse.) They were consequently also easy prey for hunters, who hunted them for sport rather than their meat. By the middle of the 1800s they were almost extinct, and in 1883 the last one died in an Amsterdam Zoo.

Painting of a quagga stallion in Louis XVI's menagerie at Versailles by Nicolas Marechal, 1793 Probably the strangest and most puzzling zoological phenomenon in the Great Karoo was the periodic, unpredictable appearance of massive springbok migrations. These migrations always came from the north, and could either go west towards Namaqualand and the sea, south-west through towns such as Beaufort West, or south through the Camdeboo district. These vast herds moved steadily and inexorably across the plains, trampling all before them, including their own kind. Le Vaillant gave the first eye-witness account of such a migration in 1782. He rode through the herd filling the Plains of Camdeboo, seeing neither the beginning nor end of the moving mass.

A springbok, one of Southern Africa's most well known antelopes or gazelles. In 1849 a massive herd of springbok, amongst whom were intermingled wildebeest, blesbok, quagga, and eland, moved through Beaufort West. Early one morning the town was awakened to a sound like that of a strong wind, and suddenly the town was filled with animals. They devoured every sprig of foliage in the town and surrounding countryside. It took three days before the last of the continuously moving herd left the town to disappear towards the west. The Karoo looked as if a fire had swept through it. During these migrations the plains and hillsides on every side were thickly covered by one vast mass of springbok, packed like sheep in a fold. As far as the eye could see, the landscape was alive with them.

During these migrations the springbok never ran or trotted. On the whole, they were silent, except for the shudder of their stamping hoofs. Nothing could divert them, and hunters could ride amongst them, shooting them at random, without apparently causing alarm. People could move amongst them and kill them with sticks, or cripple them by seizing a leg and breaking it. It was not only people who followed these herds for the easy meat they provided, but also lions, leopards, cheetahs, African wild dogs, hyenas, and jackals.

No one knew how, why or where these migrations started, nor where they ended. Nor did anyone know if these animals every returned to where they had started from. The migrations were always unidirectional, from north of the Great Karoo.

Great locust swarms also frequently invaded or arose in the Great Karoo, and still occur from time to time today.

The introduction of the windpump to tap the Great Karoo’s underground water resources in the late 1800s made permanent human habitation and sheep farming possible over large parts of the Great Karoo for the first time. As a result, the teeming number of large antelope in the Karoo has dwindled into insignificance, and, with them, the large carnivores have all but disappeared. Today the caracal (7–19 kg), black-backed jackal (6–10 kg), Verreaux's eagle (3.0–5.8 kg) and the martial eagle (3.0–6.2 kg) are arguably the largest predators likely to be seen in the Great Karoo today. Leopards (20–90 kg) do occur, especially in the mountains, but are very

secretive, and therefore rarely seen. Many of the animals that formerly inhabited the Karoo in large numbers, including lions, have been re-introduced to the area in nature reserves and game farms.

Common Species

No Fauna study has been conducted. Previous mining staff reported: Kudu, springbok, duiker, grysbok, ground squirrels, mine, cobra, genets and mongoose.

Endangered Species

The fauna listed below are endangered species that are most likely to occur in the area according to the Red Data Book – Birds (Barnes, Keith N, 2000) and the Red Data Book – Mammals (Smithers 1989 & Branch 1988).

The following definitions apply:

Vulnerable
Taxa of which all or most populations are decreasing because of: over exploitation, extensive destruction or degradation of their habitat, or other environmetal disturbances. This means that the species is considered to facing a high risk of extinction in the wild.

Rare
Taxa with small population sizes, which are not permanently endangered or vulnerable; but are potentially at risk.

- ***Endangered Mammals***

Scientific Name	Common Name	Status
Aonyx capensis	Cape Clawless Otter	Unknown
Felis lybica cafra	African Wild Cat	Vulnerable
Manis temminckii	Cape Pangolin	Vulnerable
Orycteropus afer	Antbear	Vulnerable
Atelerix frontalis	Cape Hedgehog	Rare
Naja nigricollis woodi	Black Spitting Cobra	Rare
Proteles cristatus cristatus	Aardwolf	Rare
Felis nigripes nigripes	Small Spotted Cat	Rare

- ***Endangered Birds***

Scientific Name	Common Name	Status
Gyps coprotheres	Cape Vulture	Vulnerable
Gyps africanus	African Whitebacked Vulture	Vulnerable
Torgos tracheliotos	Lappetfaced Vultures	Vulnerable
Aquila rapax	Tawny Eagle	Vulnerable
Polemactus bellicosus	Martial Eagle	Vulnerable

Anthropoides paradiseus	Blue Crane	Vulnerable
Ardeotis kori	Kori Bustard	Vulnerable
Neotis ludwigii	Ludwig's Bustard	Vulnerable

It appears that a total of 14 mammal, 35 bird, 4 reptile and 2 amphibian species may occur on the site. This figure is based on preliminary desktop study and may be higher than the actual amount of species that will be encountered with a full survey. A new full study will depict the actual species that might or can occur.

The drainage lines that run through the property are regarded as sensitive as they can form migration routes to mammals, especially when they contain water.

1.8 Natural Vegetation

The veldt type, while classified as a single unit in Acocks as Namaqualand Coast Belt from of the Succulent Karoo, in fact differs totally between the upper expansion area (Kalahari sand with Acacia aerioloba and grass) and the Veggat area (low scrub near river). (These areas being the only ones of undisturbed vegetation in the proposed mining aren).

In fact, both of them do not classify as true Succulent Karoo given that:

i. The southern expansion area is part of the localized red Aeolian sand (Kalahari sand) with a veldt type more characteristic of Kalahari Thornveld (Acacia aerioloba veldt), with characteristic mature Acacia aerioloba trees and Ehrharta cylycina (rooigras) and Stipa capensus grasses, with characteristic flowering of the bulb flowers Cybistetes longifolis (in April) and the almost total absence of typical succulents and shrubs of the Namaqualand Coastal belt.

ii. The Veggat area, by comparison shows typical Namaqualand Coast Belt vegetation dominated by:

- Non-succulents including:
  - *Galenia fruticosa* and *africana* (kraalbos)
  - *Salsola* sp. (kali - tumbleweed)
  - *Zygohyllum* sp.
  - *Salsola aphylla* (lye - ganna)
  - *Salsola calluna* (swartganne)
  - *Tetragonia spicitata*

- Succulents including:
  - *Euphorbia* sp.
  - *Crassula* sp.

- Mesembs including: *Ruschia* sp.

(While the veldt type shows a further variation in the river course where *Acacia karoo, Rhus* sp. And *Tetragonia spicitata* are found, no mining will take place in or near the river and consequently this vegetation will not be further assessed).

The alien *Nicotiana glauca* is evident in all the old disturbed areas and along the river and required eradication by uprooting and burning.

Dominant species

In the sandy areas dominant specied include grasses of *Ehrharta cyclycina* (rooigras) and *Stipa capensis* and mature *Acacia aerioloba* trees. The Veggat area is dominated by *Galenia* and *Euphorbia* sp.

Endangered or rare species

The botanical assessment did not reveal any rare or endangered species and as the veldt types are well represented in the surrounding area, the conservation significance of the site is classified as moderate on a local and regional scale.

Invader or exotic species

- Stunted Acacia Karroo on the riverbanks.
- Nicotiana glauca (Wild tobacco) in the old workings.

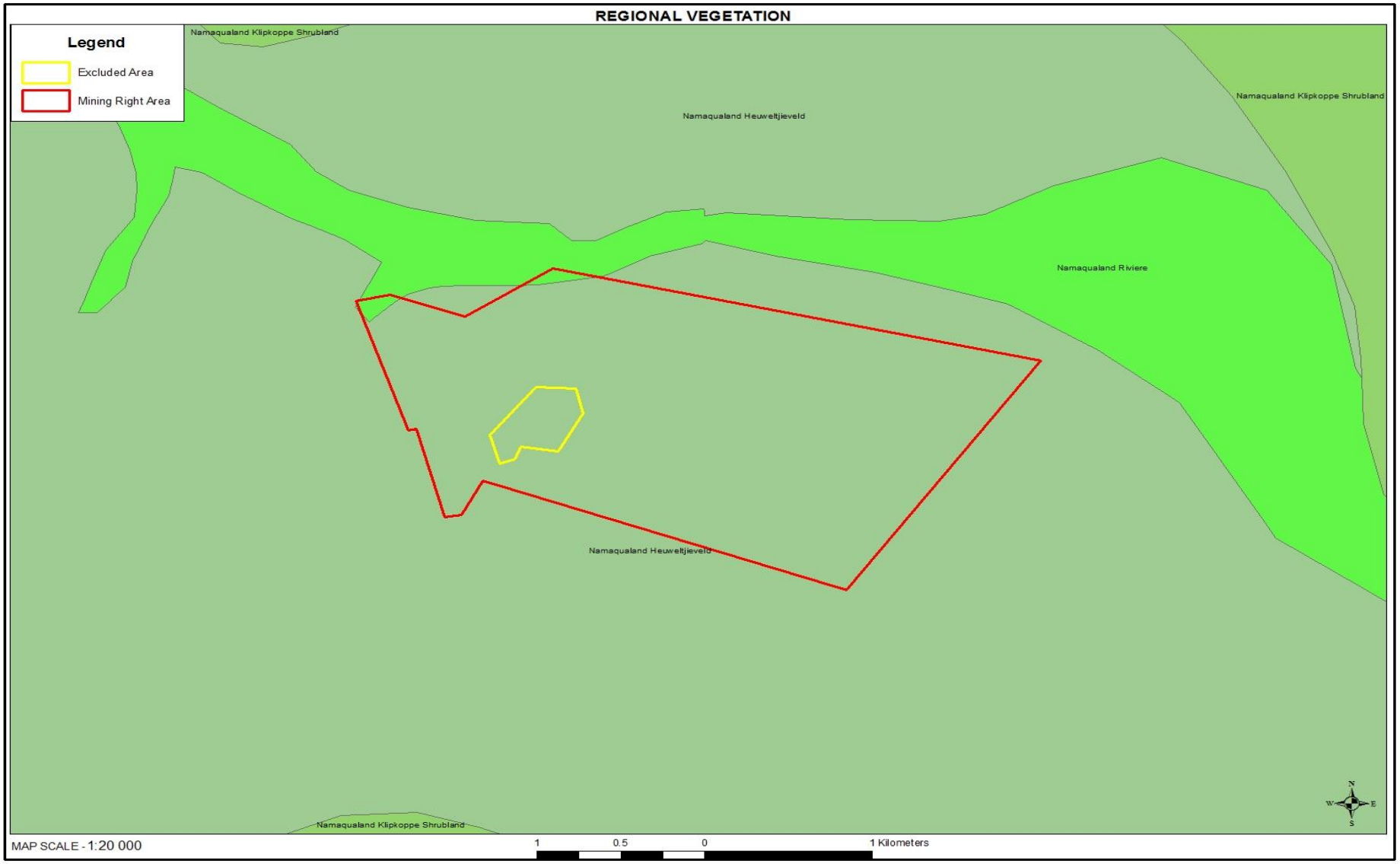


Figure 12. Vegetation map of Buffelbank.

1.9 Surface Water

The Buffels River is located 200 m north of the existing excavation as shown in Figure 13. The Buffels River is non-perennial and it is important to note that the mining programme in terms of this report is inward draining into the old excavation.

The episodic Komaggas River, a small drainage channel west of the old Trans-Hex plant, which has been protected from siltation from the Trans-Hex tailing ponds by:

- Cover of the tailings ponds (May 2001) by Trans-Hex and;
- Construction of proper storm water overflows in the weir of the Komaggas River in order that it can fulfill a full silt retention function and not affect the Buffelsbank River.

This dam previously provided supplementary water to the Trans-Hex plant operation and served as their clear water return dam during earlier mining.

Surface water Quality
The surface water quality (when it flows) is reported to be too saline for potable use.

Surface water use
Surface water in the weir is not utilized. While the surrounding commonage stock drink from the dam shortly after rains, they are provided with borehole water at stock watering points on the commonage as river water becomes to saline in remaining ponds in the dry periods.

Wetlands
No natural wetlands will be affected by the proposed mining operation as the portion of the proposed area within the Buffelsbank River bed and banks will not be mined.

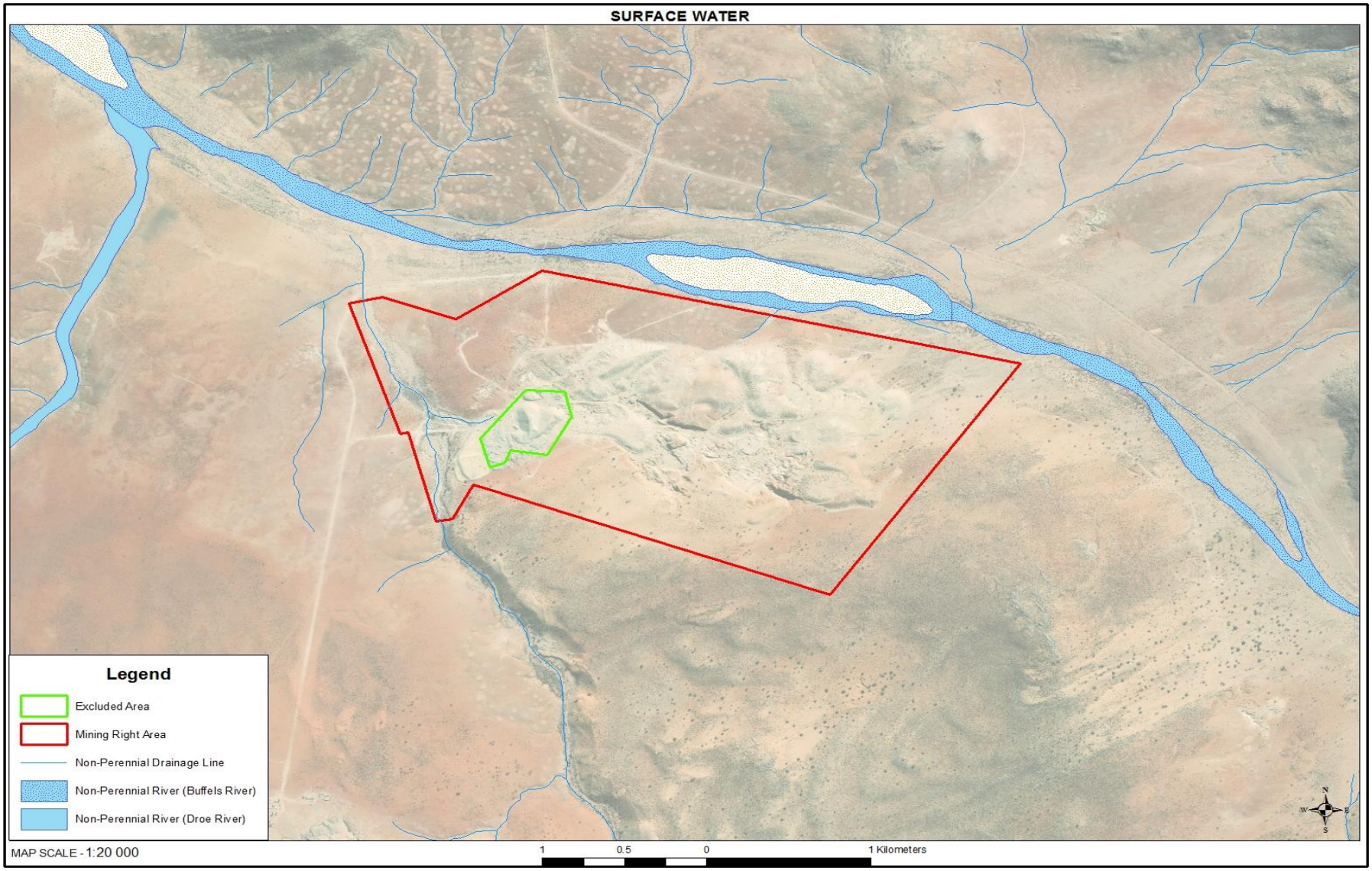


Figure 13. Surface water features in the mining application area.

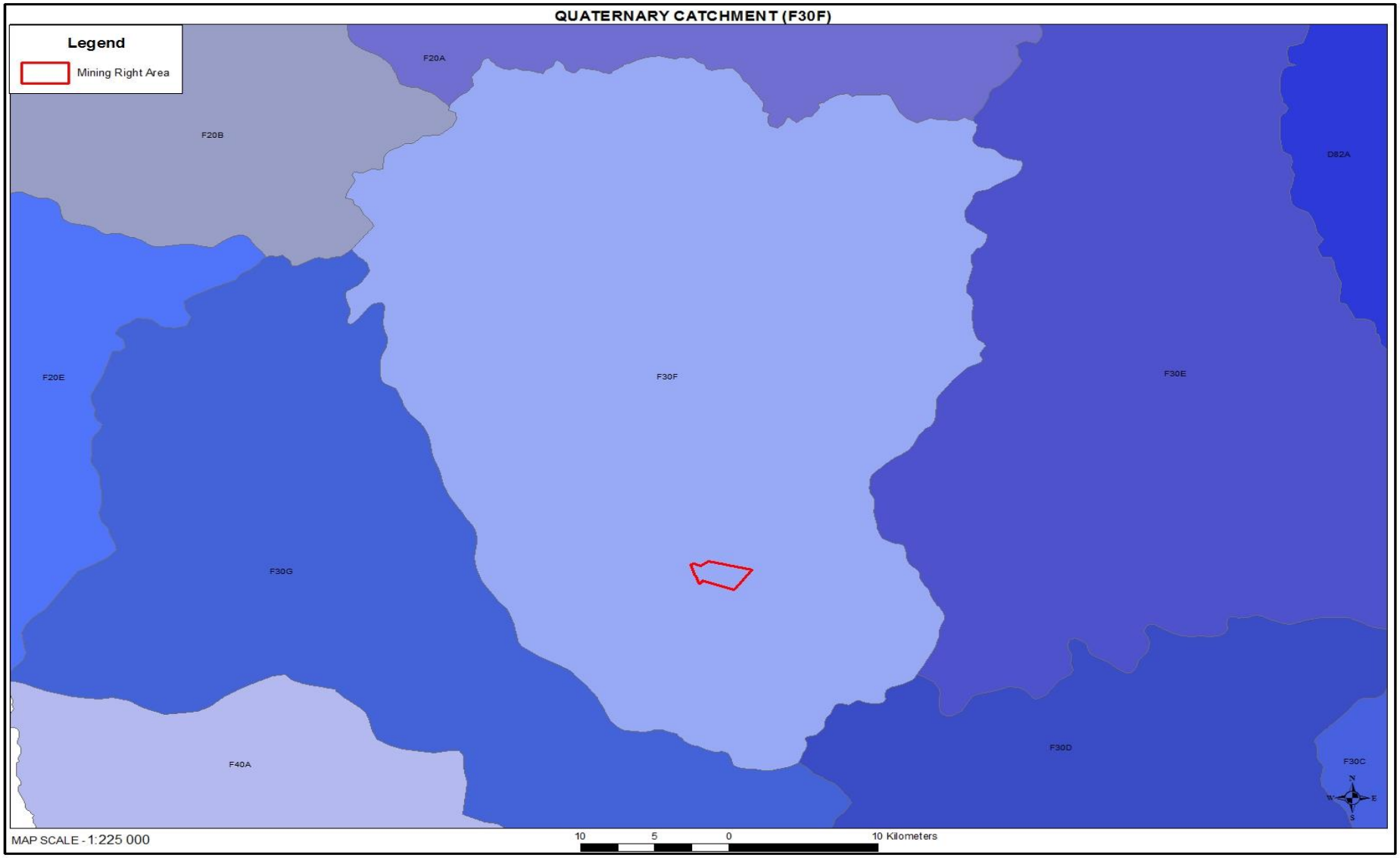


Figure 14. Quaternary Catchment Map

1.10 Ground Water

Underlying Aquifers

The groundwater is confined to two types of structures in the area. These are near-surface water above the bedrock below the aeolian soils. This source supplies water to the vegetation and is moved upwards through capillary forces. The second source occurs in fissure structures and is deeper seated. This is the main source of groundwater for agricultural purposes.

While there is a borehole on the site west of the Old Trans- Hex Plant, the depth to the water table is not known. Once mining commences the company will inspect the borehole and have pump tests conducted on it. If it is required to supplement the piped water, they will apply for recommissioning of this borehole to the Department of Water Affairs and Forestry.

Catchment and Process Water Demands

The site is located within Quaternary catchment F30F. This catchment is listed under Zone A of the Groundwater Taking Zones in the Revision of General Authorisations (GA) in Terms of Section 39 of the National Water Act, 1998 (DWAF 2004 & 2012). For Zone A, no water may be taken under GA except as set out under Schedule 11 (DWS, 2016).

Ground Water Quality

It is reported by previous mine employees to be too poor for potable use. Sampling of the water will be done as part of monitoring once mining commences.

1.11 Cultural and Heritage Resources

No cultural or historical sites were encountered. Should any excavations reveal such sites, remedial action must be taken in co-operation with a suitably qualified specialist in this field.

1.12 Air Quality

With reference to the Scheduled Processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), no scheduled process relates to any proposed mining activtiy.

Existing Sources

The current source of air pollution in the area stems from numerous gravel roads and from vehicles travelling on the gravel roads of the area. No other significant sources of air- or dust pollution currently exist in the study area. Negligible amounts of exhaust fumes are emitted by the mining machinery and vehicles used on the farm.

New Source

The majority of dust will be deposited on the mining property itself as the soils and overburden consist mainly of heavier particles. Dust control measures are in place at the crushers, which will constitute the main source of fugitive dust.

Areas of Impact

As the prevailing wind direction for the area is north to north-west for the months January to September and changing from north to sometimes westerly winds during October to December, there is neglible a potential for fall-out dust to impact on the surrounding farm properties, which can be described as the nearest potential area of impact. The dust management programme recommended should including daily dosing of acces roads and stockpile areas.

1.13 Noise

No significant sources of noise are evident in the study area.

1.14 Visual Aspects

Due to previous mining in the area and the present unrehabilitated state of the workings, the area is not a tourist attraction. The aesthetics of the area would be negatively affected if large dumps (waste of slimes) were left at closure. The height and sloping of these dumps will have to be weighed against their actual footprint. The mine will be visible from the main road towards Kleinzee due to the size of the pit. The plant area, dumps and processing is within the pit and will not be visible to bypassing traffic.

1.15 Socio-Economic Structure of the Region

All information in this section is taken out of the NAMA KHOI MUNICIPALITY: INTEGRATED DEVELOPMENT PLAN – 2017 – 2022.

The demographic information provided below indicates the state of population and the development since 1996 to 2016.

Table 5: Population by sex, 1996-2016

1996			2001			2011			2016*		
Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
21 446	22 395	43 841	22 099	22 801	44 900	23 215	23 826	47 041	22 835	23 677	46 512

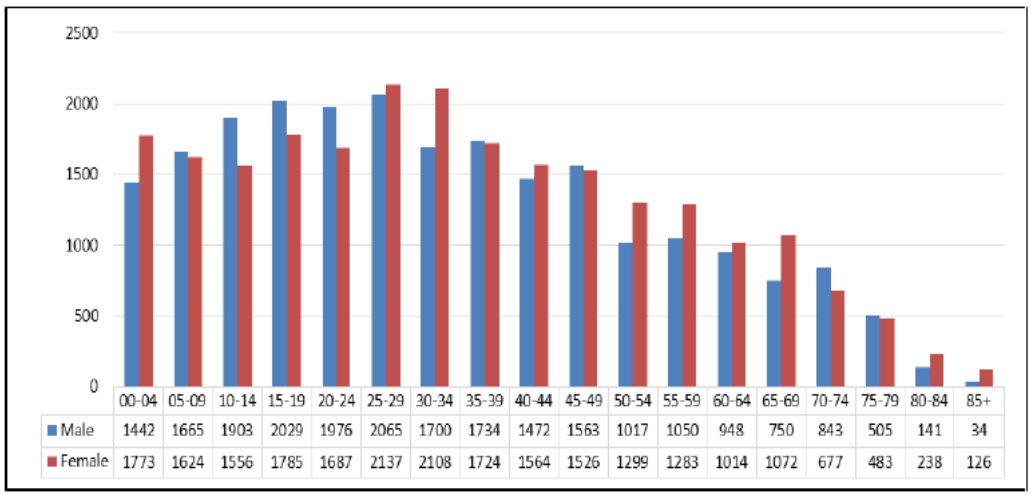
Table 5 shows that the population of Nama Khoi has increased from 43 841 persons in 1996 to 46 512 persons in 2016. The number of males increased by 1 389 persons from 21 446 persons in 1996 to 22 835 persons in 2016, whilst the number of females increased by 1 282 persons over the same period. Gender proportions show that there are more females than males in the municipality.

POPULATION AND POPULATION GROWTH

Table 6 summarizes the population for Nama Khoi by five-year age groups and sex. It shows a general increase in the population for the age groups over the period 1996 to 2016, with the exception of the younger ages 0 to 19, where a decrease in the population is observed. The number of elderly persons aged 65 years and above increased significantly over this period.

Table 6: Population in 5 year age groups and sex, 1996-2016

	1996			2001			2011			2 016		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
00 - 04	2 241	2 175	4 416	1 992	1 932	3 925	1 968	1 789	3 757	1 442	1 773	3 215
05 - 09	2 334	2 282	4 615	2 187	2 136	4 323	1 966	1 830	3 795	1 665	1 624	3 290
10 - 14	2 329	2 485	4 814	2 341	2 304	4 645	2 137	2 009	4 146	1 903	1 556	3 459
15 - 19	2 340	2 320	4 660	2 208	2 304	4 511	2 319	2 128	4 447	2 029	1 785	3 813
20 - 24	1 795	1 743	3 539	1 896	1 774	3 669	1 839	1 773	3 613	1 976	1 687	3 663
25 - 29	1 715	1 849	3 564	1 877	1 686	3 562	1 715	1 735	3 450	2 065	2 137	4 202
30 - 34	1 533	1 748	3 281	1 766	1 790	3 556	1 641	1 677	3 318	1 700	2 108	3 808
35 - 39	1 399	1 526	2 925	1 531	1 636	3 167	1 613	1 622	3 234	1 734	1 724	3 457
40 - 44	1 292	1 413	2 705	1 394	1 509	2 903	1 568	1 778	3 346	1 472	1 564	3 036
45 - 49	1 070	1 137	2 207	1 325	1 440	2 765	1 456	1 592	3 047	1 563	1 526	3 090
50 - 54	908	954	1 862	1 052	1 107	2 159	1 291	1 425	2 716	1 017	1 299	2 316
55 - 59	762	740	1 502	836	908	1 744	1 137	1 276	2 413	1 050	1 283	2 333
60 - 64	535	597	1 132	656	756	1 412	890	1 002	1 892	948	1 014	1 962
65 - 69	384	454	838	426	569	994	671	799	1 471	750	1 072	1 821
70 - 74	216	327	543	303	376	679	500	576	1 076	843	677	1 520
75 - 79	169	227	396	144	259	403	257	393	650	505	483	987
80 - 84	120	178	298	105	162	267	137	241	378	141	238	379
85+	76	129	205	61	153	214	110	183	293	34	126	160
Unspecified	228	109	338	-	-	-	-	-	-	-	-	-
Total	21 446	22 393	43 840	22 100	22 801	44 898	23 215	23 828	47 042	22 837	23 676	46 511



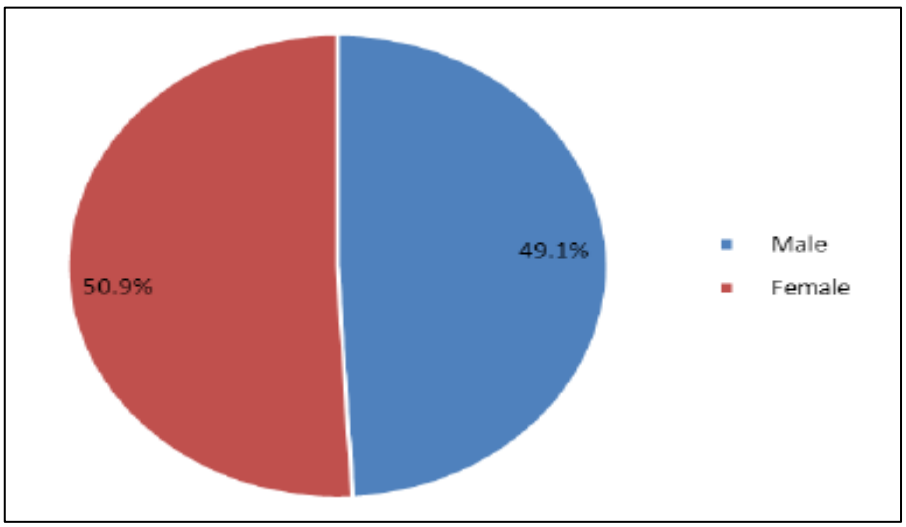
	00-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Male	1442	1665	1903	2029	1976	2065	1700	1734	1472	1563	1017	1050	948	750	843	505	141	34
Female	1773	1624	1556	1785	1687	2137	2108	1724	1564	1526	1299	1283	1014	1072	677	483	238	126

Graph 1: Distribution of the total population by age group and sex, 2016.

Graph 1 indicates that the greater proportion of the population in Nama Khoi is young, consisting mainly of children and youth. There is however a greater proportion of males compared to females for ages from 5 to 24 years, and the female population shows a slightly greater proportion in numbers compared to males for the ages of 50 years and above. This signifies a greater lifespan for females than males.

SEX RATIO AND GENDER

The sex ratio is one of the key measures of sex composition. It gives the number of males for every 100 females. If it is above 100, it shows the predominance of males over females; conversely when it is lower than 100, the reverse is true. Generally, sex ratios at birth are high and decrease gradually as age increases. As seen in graph 2 below 50.9% of the Nama Khoi Municipalities population consists out of females and 49.1% consists of males.



Graph 2: Percentage distribution of the population in Nama Khoi by sex, 2016.

EDUCATION

Table 7 shows an improvement in the level of education in Nama Khoi over the period 1996 to 2016, where there was a decline in the number and proportion of persons aged 20 years and above with no schooling (from 11.1% to 1.5%). It shows an increase in the proportion of persons with a higher education, from 4.7% in 1996 to 7.2% in 2016. There is a significant increase in the proportion of persons who have grade 12/standard 10.

Table 7: Education

Year	No schooling	Some Primary	Complete Primary	Some Secondary	Grade 12/Std 10	Higher	Total
Number							
1996	4 277	11 509	4 381	13 175	3 210	1 814	38 366
2001	2 632	12 256	4 563	14 851	4 873	1 801	40 975
2011	991	11 275	4 149	16 550	6 472	2 381	41 818
2016	467	3 913	2 795	14 338	7 713	2 258	31 485
Percent (%)							
1996	11.1	30.0	11.4	34.3	8.4	4.7	100.0
2001	6.4	29.9	11.1	36.2	11.9	4.4	100.0
2011	2.4	27.0	9.9	39.6	15.5	5.7	100.0
2016	1.5	12.4	8.9	45.5	24.5	7.2	100.0

HOUSEHOLDS

There are 14 547 households in the Nama Khoi District in 2016. Table 8 shows that the total number of households in Nama Khoi increased by 4 818 households over the period 1996 to 2016, from 9 729 to 14 547. It shows a significant increase in the number of three-person households, from 1 610 in 1996 to 3 196 in 2016.

Table 8: Number of household by household size, 1996-2016

	1	2	3	4	5	6	7	8	9	10+	Total
1996	1 143	1 395	1 610	1 940	1 474	861	485	288	316	217	9 729
2001	2 550	1 912	1 975	2 224	1 423	885	475	274	175	272	12 165
2011	2 814	2 726	2 433	2 439	1 313	760	435	236	125	181	13 462
2016	2 301	2 932	3 196	2 735	1 770	743	408	147	133	182	14 547

Table 9 shows an increase in the proportion of households staying in formal dwellings in Nama Khoi. Households occupying formal dwellings increased by 3.4% from 90.2% in 1996 to 93.6% in 2016. It shows a decrease in the proportion in the proportion of informal dwellings, from 3.6% in 1996 to 1.5% in 2016. The proportion of traditional dwellings increased over this period.

Table 9: Type of dwelling occupied by household, 1996-2016

	Formal dwelling	Informal dwelling	Traditional dwelling	Other	Total
1996	90.2	3.6	3.4	1.4	100.0
2001	79.7	3.8	6.2	0.8	100.0
2011	92.8	2.6	1.0	1.6	100.0
2016	93.6	1.5	3.6	1.3	100.0

HOUSEHOLD DYNAMICS

A significant increase in the number of female-headed households when compared to male-headed households in Nama Khoi over the period 1996 to 2016 can be seen in Table 10. Female-headed households increased from 3 069 in 1996 to 5 965 in 2016, whilst those headed by females increased from 6 616 in 1996 to 8 582 in 2016

Table 10: Household head by sex, 1996-2016

	1996	2001	2011	2016
Male	6 616	7 714	8 177	8 582
Female	3 069	4 419	5 263	5 965
Total	9 685	12 133	13 440	14 547

HOUSEHOLD SERVICES

An increase in the proportion of households in Nama Khoi municipality whose refuse is removed weekly can be seen in Table 11. The increase is from 79.0% in 1996 to 89.2% in 2016. It also shows a decrease in the proportion of households that have no rubbish disposal.

Table 11: Type of refuse removal used by households, 1996-2016

	Removed by local authority at least once a week	Removed by local authority less often	Communal refuse dump	Own refuse dump	No rubbish disposal	Other	Total
1996	79.0	4.2	0.8	13.0	3.0	0.1	100.0
2001	86.4	0.7	0.6	9.9	2.4	0.0	100.0
2011	89.0	0.3	0.1	7.9	2.2	0.5	100.0
2016	89.2	3.8	0.6	4.3	0.8	1.3	100.0

The sanitation facilities used by households in the Nama Khoi municipality can be seen in Table 12 below. Table 12 shows an increase in the proportion of households that use a flush or chemical toilet in Nama Khoi, from 45.7% in 1996 to 83.0% in 2016. There is a decrease in proportion of households using a pit latrine toilet, from 13.3% in 1996 to 12.7% in 2016. There is a decrease in the proportion of households using a bucket latrine between 1996 and 2016.

Table 12: Type of sanitation facilities used by household, 1996-2016

	Flush or chemical	Pit latrine	Bucket latrine	None of the above	Total
1996	45.7	13.3	33.8	6.8	100.0
2001	71.3	5.9	16.4	6.4	100.0
2011	75.9	16.8	1.2	5.9	100.0
2016	83.0	12.7	1.7	2.1	100.0

The energy sources used by households in the Nama Khoi municipality can be seen in the table below (Table 13). Table 13 shows an increase in the proportion of households using electricity connected to the mains for lighting in Nama Khoi local municipality, from 71.8% in 1996 to 97.2% in 2016. It shows a significant decrease in households that use candles as the main source of energy for lighting.

Table 13: Main source of energy used for lighting, 1996-2016

	Electricity from mains	Gas	Paraffin	Candles	Solar	Other	Total
1996	71.8	0.2	4.1	23.9	0.0	0.0	100.0
2001	85.8	0.3	1.4	11.8	0.5	0.3	100.0
2011	93.6	0.1	0.4	5.1	0.7	0.0	100.0
2016	97.2	0.0	0.1	1.8	0.9	0.1	100.0

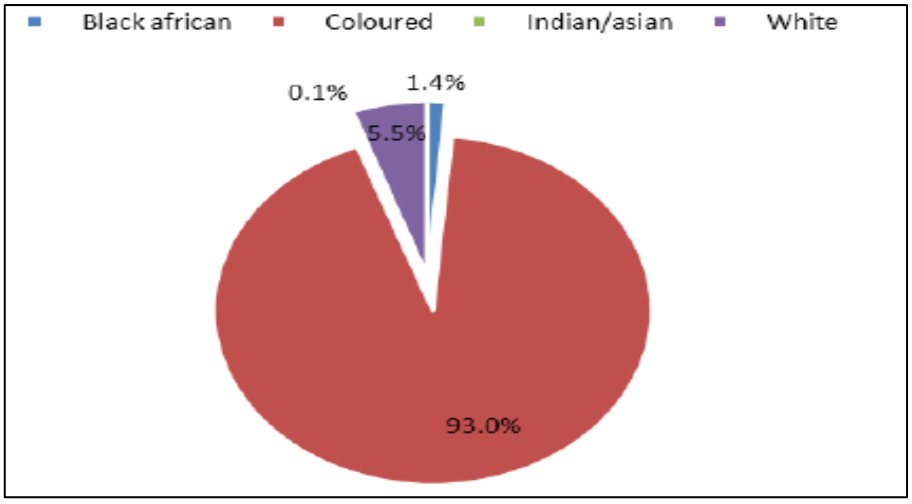
POPULATION GROUPS

Table 14 summarizes the number of persons by population group from 1996 to 2016. There was an increase in the Coloured population over the period 1996 to 2016, whilst the Black African, White and Indian/Asian population shows a decline over the same period. There is a decrease however in the White population over the 20 year period.

Table 14 – Population group

	1996	2001	2011	2016
Black African	961	1 273	1 959	663
Coloured	37 541	39 452	41 425	43 243
Indian or Asian	29	55	219	27
White	4 814	4 120	3 084	2 580
Other	-	-	353	-
Unspecified	496	-	-	-
Total	43 841	44 900	47 041	46 513

Graph 3 below outlines the percentage distribution of the population of Nama Khoi in 2016, where the Coloured population group accounts for 93.0% of the population in the municipality, followed by the White, Black African and the Indian/Asian population groups respectively.



Graph 3: Percentage distribution by population group type, Nama Khoi, 2016.

LANGUAGES SPEAK

The table below (Table 15) shows that Afrikaans is the most dominant language in Nama Khoi with 98.9% of the population indicating that this was the language most often spoken in the home. This is followed by English with 0.5% and IsiXhosa with 0.4%. Other languages spoken in the Nama Khoi district includes sign language, Sepedi and Setswana.

Table 15 – Language

Language spoken in household	Number	Percentage (%)
Afrikaans	45 315	98.9
English	218	0.5
IsiXhosa	186	0.4
Setswana	38	0.1
Sepedi	31	0.1
Sign language	13	0.0
Other	3	0.0
Total	**45 805**	**100.0**

1.17 Sensitive Landscapes

"Sensitive Environments" that have statutory protection are the following:-

1. Limited development areas (Section 23 of the Environmental Conservation Act, 1989 (Act 73 of 1989).
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.

5. National monuments and gardens of remembrance.
6. Archaeological and palaeontological sites.
7. Graves and burial sites.
8. Lake areas, offshore islands and the admiralty reserve.
9. Estuaries, lagoons, wetlands and lakes.
10. Streams and river channels and their banks.
11. Dunes and beaches.
12. Caves and sites of geological significance.
13. Battle and burial sites.
14. Habitat and/or breeding sites of Red Data Book species.
15. Areas or sites of outstanding natural beauty.
16. Areas or sites of special scientific interest.
17. Areas or sites of special social, cultural or historical interest.
18. Declared national heritage sites.
19. Mountain catchment areas.
20. Areas with eco-tourism potential.

(b) Description of the Current Land Uses

Land Use Prior to Mining

Prior to the first mining activities the land was used by local residents for nomadic grazing. However, the area was subjected to various mining activities since.

Historical Agricultural Activities

The property had been used for nomadic grazing by local residents.

Evidence of Abuse

Mining took place in the past, leaving the area in its current status. Present misuse is in the form of illegal diamond mining by under-digging of the mine sidewalls in

the gravel zone, creating extremely dangerous situations because caving can take place, burying the culprits.

Existing Structures

Existing structures on the mine site includes infrastructure from previous mining activities.

(c) Description of Specific Environmental Features and Infrastructure on the Site

Please see Baseline Description above.

(d) Environmental and Current Land Use Map

(Show all environmental, and current land use features)

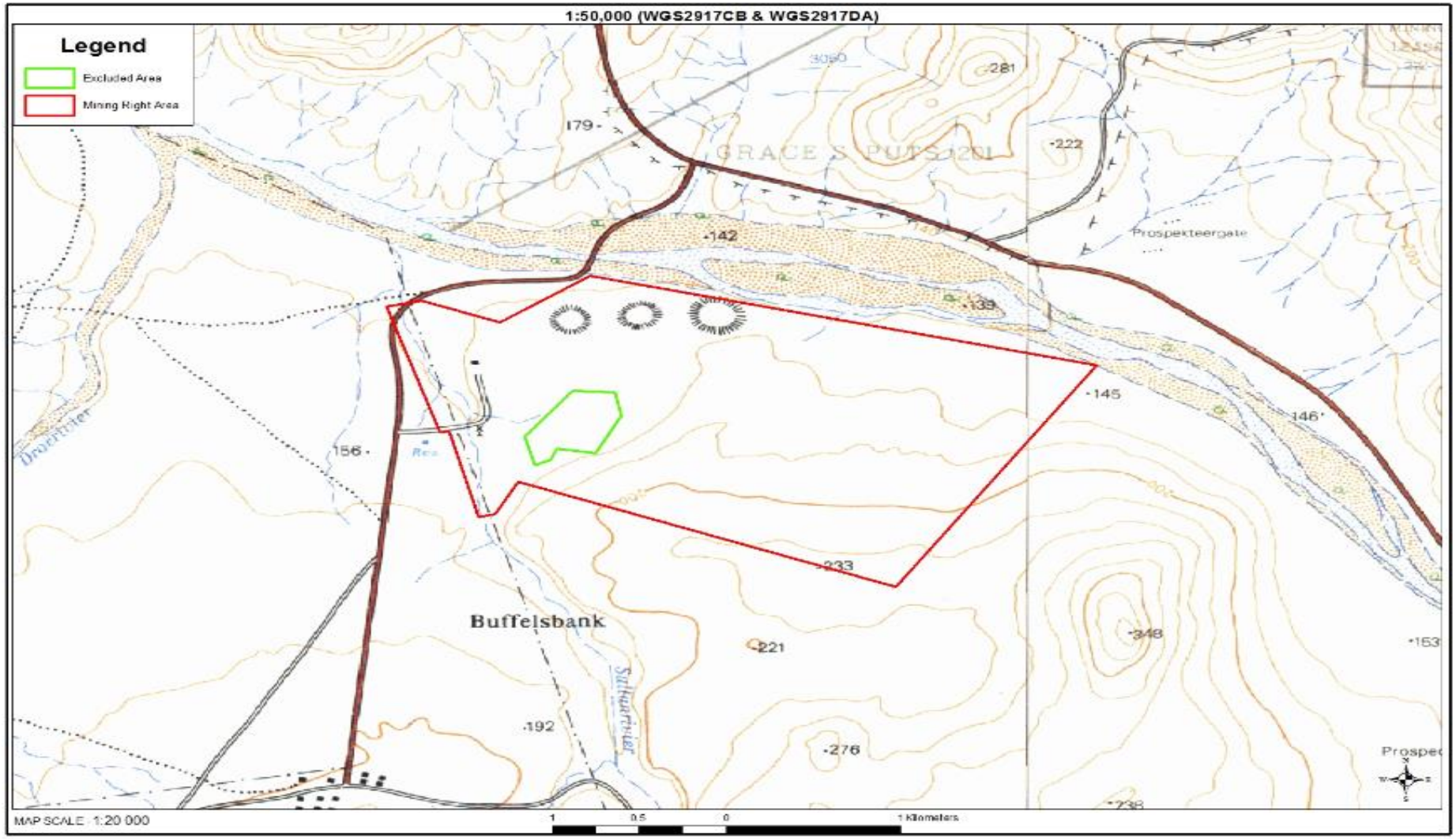


Figure 15. Show all environmental, and current land use features

v) Impacts identified

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

Table 16: Impacts Identified

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence	Management
PHYSICAL						
Geology and mineral resource	Sterilisation of mineral resources.	Low	Certain	Decommissioning	Moderate	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography due to construction of evaporation ponds, topsoil removal, placement of infrastructure.	Low to Medium	Certain	Long Term Life of operation	Moderate	Employ effective rehabilitation strategies to restore surface topography of excavations and stock piles.
Soils	Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Low to Medium	Certain	Long Term Life of operation	Minimal	Employ appropriate management strategies to preserve all resources.
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Very low	Possible	Short term	Minimal	Employ appropriate rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor placement of	Very low	Possible	Short term	Minimal	Carefully plan the placement of infrastructure and

	surface infrastructure and ineffective rehabilitation.					employ rehabilitation strategies to restore land capability.
Ground water	Pollution of underground water sources.	Low	Possible	Long Term Residual	Minimal	Construction measures to prevent seepage into the groundwater by biological and engineering means. Implementation of the necessary management programs to ensure the integrity of ground water resources.
Surface water	Deterioration in water quality through spillages and runoff from sites.	Medium	Possible	Long Term Residual	Critical	Prevention of overspill of mine associated activities into the surrounding environment. Implementation of the necessary management programs to ensure the integrity of run off surface water resources.
Indigenous flora	The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function.	Low to medium	Certain	Long Term Life of operation	High	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Alien invasive plants	Proliferation of alien invasive plant species.	Low to medium	Possible	Long Term Life of operation	High	Eradicate and control the spread of alien invasive species.

Fauna	Displacement of faunal species.	Low	Possible	Long Term Life of operation	Minimal	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection strategies.
Habitat	The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Low to medium	Certain	Long Term Residual	Critical	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection strategies.
Air quality	Sources of atmospheric emission associated with the mining operation are likely to include fugitive dust from gravel roads, wind erosion of stockpiles and vehicle entrainment of road dust.	Low	Certain	Life of operation Decommissioning	Low	Effective soil management; identification of the required control efficiencies in order to maintain dust generation within acceptable levels.
SOCIAL SURROUNDINGS						
Noise and vibration	Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by means of increased noise and vibration.	Low to medium	Certain	Long Term Life of operation	Minimal	Minimise the generation of excessive noise and vibration; ensure all vehicles and equipment is in a good working order.

Visual impacts	Visual impacts of the mine infrastructure, evaporation ponds ; visibility of dust.	Low to medium	Certain	Decommissioning	Minimal	Effective planning of the location of infrastructure and operations to minimise visual impact.
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Possible	Life of operation Decommissioning	Minimal	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The deterioration of sites of cultural and heritage importance.	Low	Low likelihood	Residual	Major	Preservation and protection of heritage and cultural resources identified within a no go zone; further resources uncovered during mining activities need to be reported to a suitably qualified archaeologist.
Socio-economic	<u>Negative:</u> Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during mine closure. <u>Positive:</u> Upliftment of previously	Low and low to medium Medium to High	Certain	Short-term and closure Life of operation Decommissioning	High and major	Application of commitments made in the Social and Labour Plan; implementation of community development programmes.

	disadvantaged communities.					
Interested and affected parties	Loss of trust and a good standing relationship between the IAPs and the mining company.	Low to medium	Possible	Decommissioning	High	Ensure continuous and transparent communication with IAPs.

vi) Methodology used in determining and ranking the nature, significance, consequences, extend, duration and probability of potential environmental impacts and risks

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

The Different environmental components on which the project (can) have an impact are:

1. **Geology**
2. **Topography**
3. **Soil**
4. **Land Capability**
5. **Land Use**
6. **Flora (Vegetation)**
7. **Fauna**
8. **Surface Water**
9. **Ground Water**
10. **Air Quality**
11. **Noise and vibration**
12. **Archaeological and Cultural Sites**
13. **Sensitive Landscapes**
14. **Visual Aspects**
15. **Socio-Economic Structures**
16. **Interested and Affected Parties**

Impact Assessment

Before the impact assessment could be done the different project Activities/infrastructure components were identified.

Mining Method

Mafisa Mining will make use of the open cast mining method as described below. Mining is to take place as a continuation of earlier surface mining and briefly entails;

- the removal of overburden above the diamond bearing gravels and clays by excavator and dozer to expose the gravels and diamondiferous clays which overlie the bedrock;
- removal of the diamondiferous clays and gravels which will be sent to the plant for processing and diamond recovery; and
- the sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing.

The first stage of mining will involve the mining of the proven reserves (Areas T1 & T2 as seen in Fig. 3). The reason for this is that these blocks are situated closest to the current plant site. Furthermore, the mining of these areas will also enable the company to create a slot into the paleochannel from where long wall mining can continue as well as to remove terrace gravels in order to unlock more paleo gravels.

The next stage will involve mining of block C1 from where long wall mining will continue to block C2 to C6. Preliminary planning is to move then to the proven reserves (Areas T3 & T4 Figure 3) followed by mining the rest of the paleo channel block C7 and C8. Depending on grade, the final stage would be mining of the terrace gravels block T5, still regarded as an inferred resource. The gravel will be mined by means of strip mining on long benches. The solidified sands (overburden horizon) will be removed in with three benches, each with a BW of 5m and BH of 13m.

Shallow paleo channels also exist on the northern and western portions of the mining area and these areas needs to be worked by hand. This will be done by small miners from the local community in partnership with the company under cover of this mining right and EA. In the centre of the mine pit there is also an area where the bedrock still needs to be swept and this will also be done by small miners from the local community in partnership with the company.

Excavation process

A layer of topsoil ±50cm thick will be removed from the new mining blocks. Only 50% of the topsoil recovered will be stockpiled for rehabilitation of the new mining blocks and the rest will be used to cover the existing mined-out sections on a continuous basis as stripping is taking place. will be replaced on the mined-out sections. The topsoil stockpiles for rehabilitation of the new mining blocks will be placed within the mine pit and no new stockpiles will be created above natural ground level.

Overburden handling will generally occur along the principles of a cut & fill strip mining operation where the removed overburden is used immediately in the backfill of previously mined cuts. No overburden will be dumped on natural ground level.

The top layer of gravel is bulldozed onto stockpiles from which it is loaded into Articulated Dump Trucks (ADT's) either by excavator or front-end loader for transport. The remaining 1-1.5 m of gravel is then removed from the uneven calcrete substrate by means of an excavator. Excavation continues to the base of the gravels where higher basal grades are expected to occur. Where the bedrock

is soft, approximately 20cm of bedrock is excavated with the gravels, so that any diamonds in the weathered rock will be recovered. The primary gravels are subjected to infield screening to -35mm by means of a mobile screening plant. The screened material (ore) is then transported by ADT's to the diamond processing area where it is stored on the ore stockpile to be processed.

Mineral processing

Material from ore stockpile is fed into the trommel screen feed bin using a front-end loader. The material is combined with water introduced into the scrubber from the clear water return dam. The discharge of the scrubber is directly into the trommel screen which scalps the material at ±35 mm.

All oversize material is transported via a conveyor to a temporary stockpile from where it will be used to backfill excavations. Material 2.5-35 mm is transported to the pan's rotary distributor via a conveyor belt equipped with a weightometer used to record the feed tonnage to the pan, panfeed on average 80tph.

Undersize material and slurry from the trommel screen are pumped to a separator cyclone situated above the pan tailings bin. The cyclone underflow discharges directly into the bin whilst the cyclone overflow discharges into a sump, which is then pumped to an agitated pulp header tank situated above the pan. Pulp from the header tank is introduced into the rotary distributor where it is combined with the feed material and discharged directly into the pan.

The tailings from the pan (overflow) discharges continually onto an individual dewatering screen, coarse residue (CR) discharges onto common transfer conveyor and the screen undersize and slurry (FR) reports to a central sump. The slurry is pumped to a dewatering cyclone and dry slimes discharges to the mine FRD within the excavation. The CR tailings are transported via conveyor belt to the pan tailings bin where it is combined with the separator cyclone underflow; this material is then dumped into the relevant open excavations as part of the on-going rehabilitation process.

The concentrate from the pan is collected in a concentrate bin and moved to the final recovery area where final concentration takes place by means of pleitz jigs before it is moved to the sorting tables for final sorting by hand.

The criteria used to assess the significance of the impacts are shown in the table 23 below/overleaf. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x Probability weighting

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 17: Significance of impacts is defined as follows.

SIGNIFICANCE				
Colour Code	**Significance rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Significance of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium Low- Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Before any assessment can made the following evaluation criteria need to be described.

Table 18: Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Improbable	<20% sure of particular fact or likelihood of impact occurring
2	Low Probability Possible	20 – 39% sure of particular fact or likelihood of impact occurring
3	Probable /Likely	40 – 65% sure of particular fact or likelihood of impact occurring
4	Highly Probable /Likely	66 – 85% sure of particular fact or likelihood of impact occurring
5	Definite	86% - 100% sure of particular fact or likelihood of impact occurring

Table 19: Explanation of **EXTENT** of impact

Weight	Extent of Impact	Explanation of Extent
1	Footprint	Direct and Indirect impacts limited to the activity, such as footprint occurring within the total site area of impact only.
2	Surrounding Area **Site**	Direct and Indirect impacts affecting environmental elements **within 2 km of site**
3	Local Municipality **Local**	Direct and Indirect impacts affecting environmental elements within the **Nama Khoi area**
4	Regional/District **Regional**	Direct and Indirect impacts affecting environmental elements within District **(Namaqua District)**
5	**Provincial**	Direct and Indirect impacts affecting environmental elements in the **Northern Cape Province**

Table 20: Explanation of **DURATION** of impact

Weight	Duration of Impact	Explanation of Duration
1	Temporary (Very Short)	Less than 1 year
2	Short term	1 to 5 years
3	Medium term	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

Table 21: Explanation of **SEVERITY** of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
3	Low	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation

		and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
4	Moderately Severe	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
5	High Severance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
6	Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

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

During construction and operation of the mine, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and alluvial mining will unearth the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of infrastructure and loading, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and operation of the mine, there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will

render the soil unusable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for limited grazing, but grazing activities can still be performed in areas not earmarked for mining, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resources during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and mining activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitate following disturbance events. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species, if present, will be destroyed during the mining operation.

While general clearing of the area and mining activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the mining site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to mining and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to mining activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the mine and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected

population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the mining operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The mine will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by mining activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The mining operation, especially during construction, will create a number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the mine, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact, although small due to the small scale of the operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the mine workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the mine, and that the economy will not decline to its original level prior to the development of this project. This is because the mine will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the mine closure in advance, but it is acceptable to assume that the mine closure will have a negative impact on the local and

regional economy with a high probability of occurrence, a low severity and a low significance.

Positive impacts include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

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

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

Geology and Mineral Resource

Level of risk: Low

Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning.
- The alluvial deposit should be delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- No dumping of materials prior to approval by the mine manager.

Topography

Level of risk: Low

Mitigation measures

- Mine all alluvial diamond gravels and rehabilitate material back up to natural ground level.
- Do controlled dumping.
- Employ effective rehabilitation strategies to restore surface topography of stockpile sites.
- Stabilise the excavations and mine residue deposits.
- All temporary infrastructures will be demolished during closure.

Soil Erosion

Level of risk: Very low

Mitigation measures

- At no point may plant cover be removed within the no-development areas.
- All attempts must be made to avoid exposure of dispersive soils.

- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- The mining operation must co-ordinate different activities in order to optimise the utilisation of the alluvial mining operation and thereby prevent repeated and unnecessary dumping.
- Construction that requires the clearing of large areas of vegetation should ideally occur during the dry season only.
- Construction during the rainy season (May to August) should be closely monitored and controlled.
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding carriers.
- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Stockpiles susceptible to wind erosion must be covered during windy periods.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial action, including the rehabilitation of eroded areas, must occur.
- Dust suppression must take place, without compromising the water balance of the area.
- Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.

Soil Pollution

Level of risk: Very low

Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared to rapid clean-up procedures.
- All facilities where dangerous materials are stored must be contained in a bund wall.
- Vehicles and machinery should be regularly serviced and maintained.

Land Capability and Land Use

Level of risk: Very low

Mitigation measures

- Ensure that optimal use is made of the available land through consultation with landowner and proper planning of mining activities.
- Surface agreement to be signed with landowners.
- Employ effective rehabilitation strategies to restore land capability and land use potential of the farm.
- All activities to be restricted within the demarcated areas.

Ground Water

Level of risk: Very low

Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- All facilities where dangerous materials are stored must be contained in a bund wall.
- Vehicles and machinery should be regularly serviced and maintained.

Surface Water

Level of risk: Very low

Mitigation measures

- No surface water will be used for the purpose of the proposed mining operation.
- No waste material of any description will be dumped or pumped into any source of surface water.
- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- Under no circumstances any ablutions occur outside of the provided facilities.
- If servicing and washing of vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil trips to contain any spillages.
- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicides and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to approved waste site.

- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- Store all litter carefully to prevent it from washing away or blown into any of the water courses within the study area.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The mining site should be cleaned daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which contributed to surface water pollution.

Indigenous Flora

Level of risk: Low to medium

Mitigation measures:

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of natural plant species.
- Ensure measures for the adherence to the speed limit.
- Footprint areas of the mining activities must be scanned for Red Listed and protected plan species prior to mining.
- It is recommended that these plants are identified and marked prior to mining.
- These plants should, where possible, be incorporated into the design layout and left in situ.
- However, if threatened and destruction by mining, these plants should be removed (with the relevant permits from DAFF and DENC) and relocated if possible.
- A management plan should be implemented to ensure proper establishment of ex situ individuals and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

Alien Invasive Plants

Level of risk: Very low

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mine site.
- Encourage the growth of natural plant species.
- Mechanical methods (hand-pulling) of control to be implemented extensively.
- Annual follow-up operations to be implemented.

Fauna

Level of risk: Very low

Mitigation measures

- Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimising the overall mining footprint.
- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.
- The extent of the proposed mine should be demarcated on site layout plans and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no-go zone for employees, machinery or even visitors.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- The ECO must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.
- The Environmental Induction should occur in the appropriate languages for the workers who may require translation.
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to the speed limit.

Habitat

Level of risk: Low

Mitigation measures

- Mining activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the mining area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

Air Quality

Level of risk: Very low

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for mining only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.

- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- The length of time where alluvial dimoand mining areas are exposed should be restricted. Mining should not be delayed after vegetation has been cleared and topsoil removed where possible.
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time.
- For all mining activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and Vibration

Level of risk: Very low

Mitigation measures

- Restrict mining activities to daytime unless agreements obtained to do 24hr operations.
- Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy event.
- Where possible material stockpiles should be placed so as to protect the boundaries from noise to individual operations.
- Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints.
- Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

Visual Impacts

Level of risk: Very low

Mitigation measures:

- Where practical, protect existing vegetation clumps during mining in order to facilitate screening during the mining operation.
- Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the mining site free from additional elements.

- Locate the stockpiles outside of the visual field of sensitive visual receptors.
- Dust suppression procedures should be implemented especially on windy days.
- Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species.
- Implement a management plan for the post-mining site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Traffic and Road Safety

Level of risk: Very low

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage Resources

Level of risk: Very low

Mitigation measures

- The heritage and cultural resources if any are encountered (e.g. graveyards, ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone.
- Stone tools should be avoided where possible and fresh exposures should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction.
- Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site destruction permit prior to commencement of construction.

Socio-economic

Level of risk: Very low

Mitigation measures

- The mine must ensure that false expectations are not created regarding job creation.
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants.
- Contractors and employees should not be permitted to wander outside the mining area.
- Uncontrolled settlement of contractors and workers outside of the site will be prevented.

- The expectations of what benefits can accrue to the community must be managed from the initiation of the project.
- Commitments as set out in the SLP must be attained.

Interested and Affected Parties

Level of risk: Very low

Mitigation measures

- Maintain active communication with IAPs.
- Ensure transparent communication with IAPs at all times.
- IAPs must be kept up to date on any changes in the mining operation.
- A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.

ix) The outcome of the site selection Matrix. Final Site Layout Plan

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

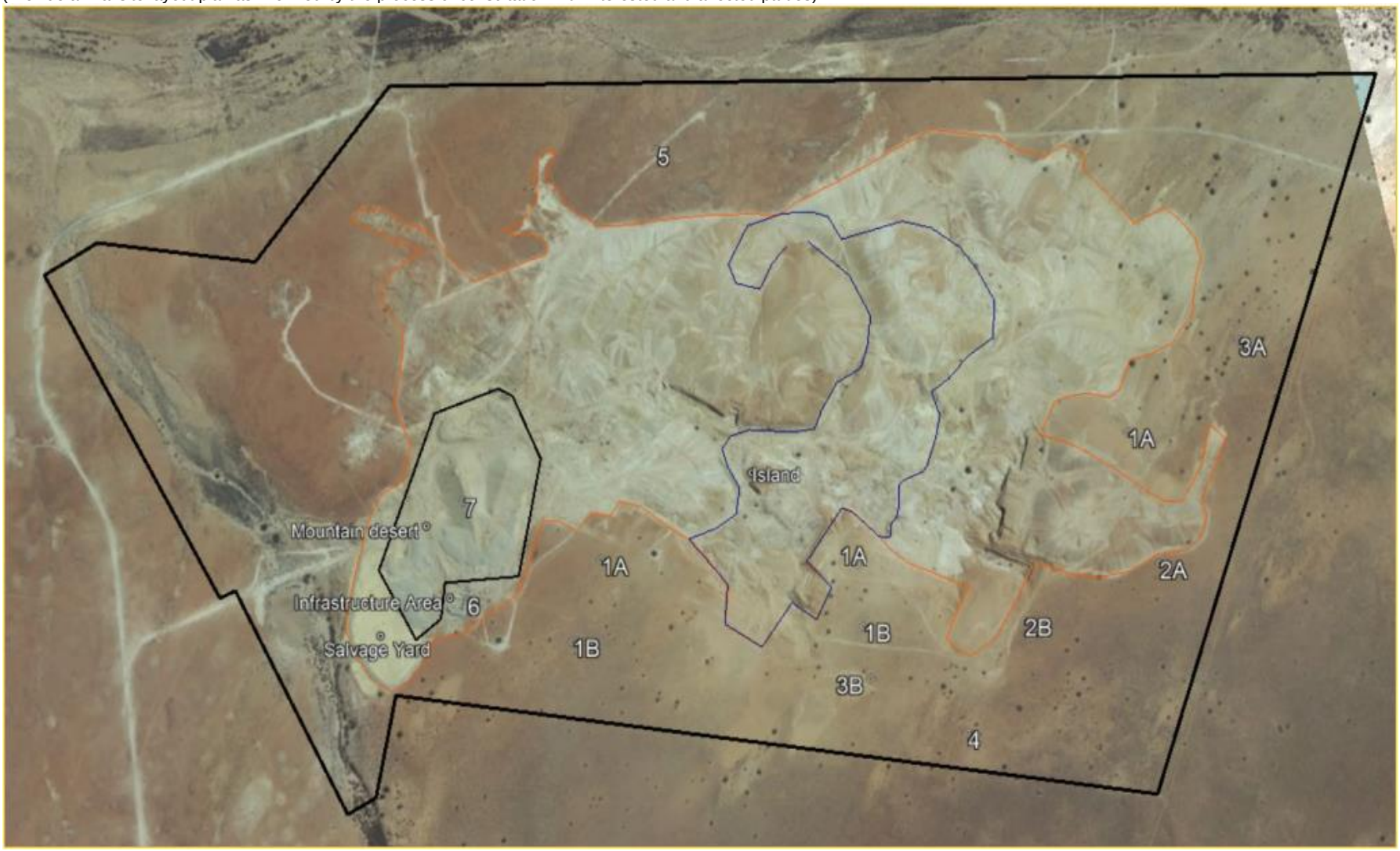


Figure 16 a. map showing mined area (orange) with exclusion area (black) and mined area with bedrock still to be swept (blue)

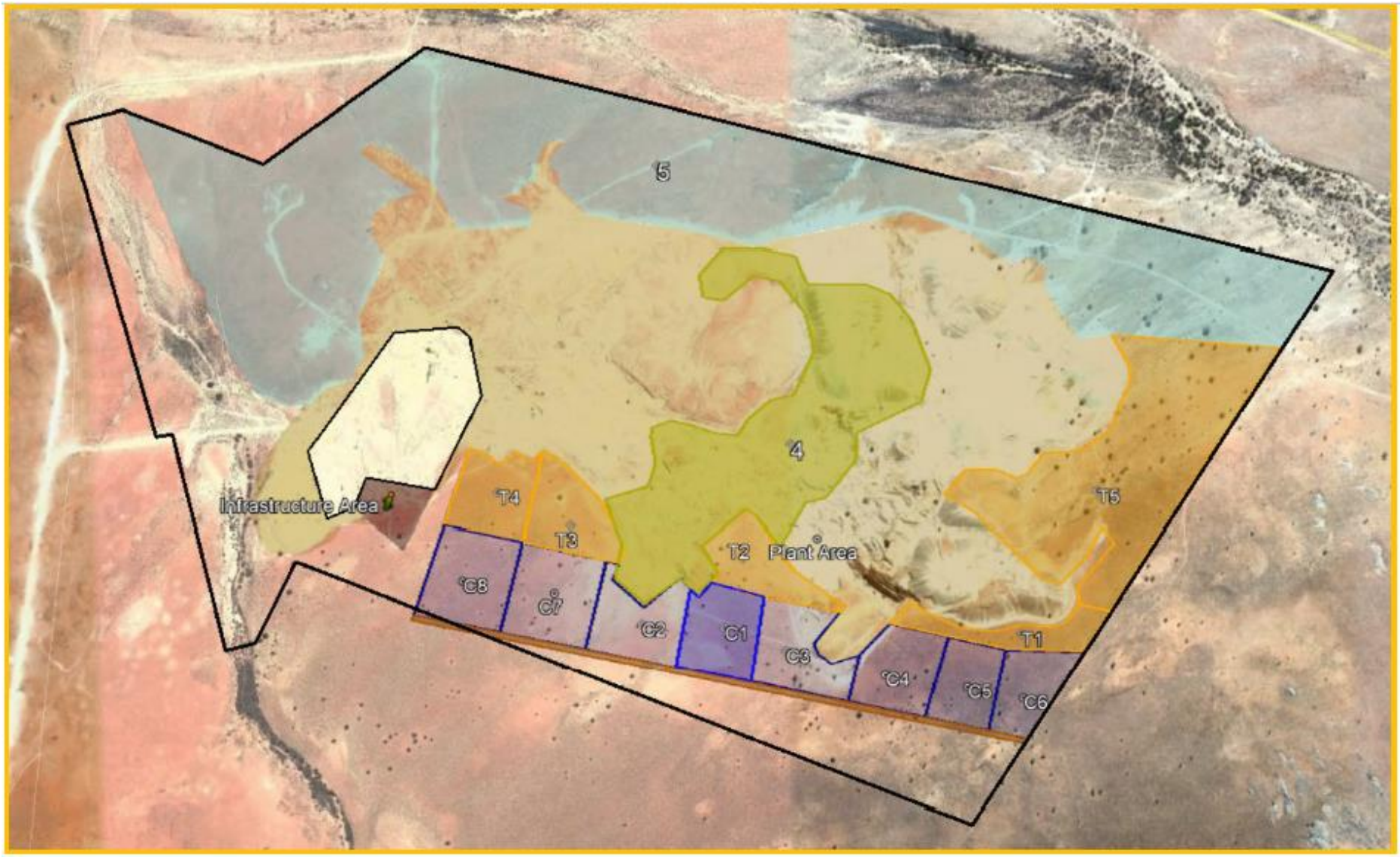


Figure 16 b. Final site layout plan

x) Motivation where no alternative sites were considered

No alternative location for the proposed mining operation was considered, as the mining company Mafisa Mining (Pty) Ltd already holds a mining right for the property and this is for the application for the renewal of the mining right. There is therefore no other alternative with regard to the overall operation footprint.

xi) Statement motivating the preferred site
(Provide a statement motivation the final site layout that is proposed)

This is an existing Mining Right with proven reserves. There is no alternative development location for the site as this is the area with the mineral resources and the area for which Mafisa Mining (Pty) Ltd holds a mining right.

i) Plan of study for the Environmental Impact Assessment Process

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

Land Use or Development Alternatives

The current land use in the site is mining by the applicants Mafisa Mining (Pty) Ltd who is the holder of a mining right on the property. When diamond mining is stopped in the area and once rehabilitated the land use can revert back to livestock farming.

Consequence if not Proceeding with the Operation

The following positive impacts will be lost if the proposed mining project is not developed:

- TAX and VAT obligations to SARS as well as Royalties;
- CAPEX spent locally and regionally;
- Employment opportunities;
- Payroll income;
- Operating expenditure and maintenance (OPEX);
- Revenue.

Mining activities are believed to be the most economically beneficial option for the area.

If the operation does not continue it would hold back any potential employment for the region and the families who are likely to benefit from the positive employment opportunities. Simultaneously, it may have a stagnant effect on the economy of South Africa and the diamond industry as a whole. Substantial tax benefits to the State and Local Government will also be inhibited.

Mining forms an integrated part of the social and economic growth of South Africa.

(ii) Description of the aspects to be assessed as part of the environmental impact assessment process

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

1. The clearing of vegetation for:
   - Access roads and haul roads
   - Surface infrastructure
   - Product Stockpile area
   - Waste disposal site (domestic and industrial waste)

2. The stripping and stockpiling of topsoil.

3. Load and Haul Operation for the mining of alluvial gravels.

4. Altering the characteristics of surface water features (possible drainage channel).

5. The development of temporary stockpiles:
   - Topsoil storage area;
   - Mine Residue Stockpile for slime.

6. The rehabilitation of footprint areas where the open casts have been opened.

7. The construction of Processing plant.

8. Loading, hauling and transporting of ROM, product and material

9. Water holding facilities, pipeline and stormwater control:
   - Clean & Dirty water system: Stormwater dam / Water storage facility;
   - Water distribution Pipeline;
   - Water tank.

10. Fuel storage and refuelling bays;
    - Fuel Storage facility (Diesel tanks);
    - Concrete bund walls and diesel depots.

11. Supporting infrastructure:
    - Temporary Offices;
    - Office Parking Bay;
    - Temporary Workshop and Wash bay;
    - Salvage yard (Storage and laydown area);
    - Ablution facilities/ Sewage facilities;
    - Generators;

(iii) Description of aspects to be assessed by specialists

Most specialist studies are needed in order to investigate the potential environmental impacts associated with the mining activities, while other more technical specialists are needed to provide strategies and technical specifications for infrastructure that could potentially alleviate the impact on the environment. Terms of reference for each of these studies are unique but include the identification and delineation of respective environmental attributes, assessing the state of these attributes, identifying potential impacts relating to these attributes and making recommendations regarding mitigation measures and legal requirements.

In terms of the screening report the following development site sensitivities was identified.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme			X	
Civil Aviation Theme				X
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme		X		
Terrestrial Biodiversity Theme	X			

An ecological study will be done as well as a Heritage and Palaeontological study as a minimum for this application.

Table 23: Description of specialist studies conducted and recommendations made by specialists

List of Studies Undertaken	Recommendations of Specialist Reports	Specialist Recommendations that have been included in the EIA Report	Reference to Applicable Section of Report where Specialist Recommendations have been Included

(iv) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

No alternative for the project location is considered since the applicant is already the holder of a mining right on the site and this is an application for the renewal of the mining right. As mentioned before, the specific occurrence of diamonds in the area dictates the selection of the specific mining site and there are no alternatives in term of project location.

In terms of alternative land use, the proposed mining operation is the only viable economic option for the area.

The mining operation will provide jobs and will also add to the increased economic activity and the area surrounding the farm.

The identification of potential impacts of the mining activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process. Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the mining activities include impacts on air quality, noise, fauna, flora, ground water, terrestrial ecology, heritage resources, socio-economy, aquatic environments, visuals, storm water and erosion. Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR are adhered to e.g. rehabilitation.

(v) The stages at which the competent authority will be consulted

Consultation with all competent authorities will be done through DMR. Whereby all documentation will be submitted to DMR and they will be circulated to the other authorities for input and assessment.

Interested and affected party consultation letters was also send via the applicant to some of the competent authorities.

(vi) Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

1. Steps to be taken to notify Interested and Affected parties

a. The consultation process with interested and affected parties (neighbouring farmers and land owners) has been done with personal visits. A copy of the Scoping Report with a cover letter as well as a comments form was hand delivered to the owners.
b. Records will be kept of the complaints and the mitigatory measures have already been implemented.
c. Correspondence of the proposed Mining Right application has been forwarded per registered post on 07 June 2021 to all identified interested and affected parties. This correspondence contained a copy of the Scoping Report with a cover letter and comments form.

d. The process as described by NEMA for Environmental Authorization was followed. See table below for the identification of Interested and affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted personally and through a letter that was given to them with registered post. Notices will be placed at the Springbok Library, in Springbok, at the Municipal Offices of the Nama Khoi Local Municipality, on the road to Komaggas, on the gravel road towards the mining area and at the entrance to the mine. With this site notice all passers-by are requested to submit any written comments to be forwarded to the consultant.
e. An Advert (Notice) will be placed in the Springbok newspaper to notify all other interested parties and affected parties of the application for a mining right and to invite any person that might be interested and or affected to register.

2. Details of the engagement process to be followed

The following procedures will be followed:

- Public meetings will be held with registered IAPs at suitable venues and on appropriate dates, depending on the feedback received during the consultation process.
- An IAP register will be compiled and regular and ongoing follow-up sessions will be held with the IAPs to monitor those issues raised during the IAP process and that are deemed to be affected by the mining operation.
- Records will be kept of the complaints and the mitigation measures implemented.

3. Description of the information to be provided to Interested and Affected Parties

The following information will be provided to IAPs:

- The site plan;
- List of activities to be authorised;
- Scale and extent of activities to be authorised;
- Typical impacts of activities to be authorised;
- The duration of the activity.

The following information will be requested from the IAPs:

- To provide information on how they consider that the proposed activities will impact on them or their socio-economic conditions;
- To provide written responses stating their suggestions to mitigate the anticipated impacts of each activity;
- To provide information on current land uses and their location within the area under consideration;
- To provide information on the location of environmental features on site to make proposals as to how and to what standard the impacts

on site can be remedied. They will be requested to make written proposals;
- To mitigate the potential impacts on their socio-economic conditions to make proposals as to how the potential impacts on their infrastructure can be managed, avoided or remedied).

(viii) Description of the tasks that will be undertaken during the environmental impact assessment process

- To ensure efficient extraction of the diamond resource.
- To limit the alteration of the surrounding topography.
- To manage and preserve sensitive soil types.
- To prevent the loss of land capability.
- To ensure the continuation of economically viable land use.
- To ensure the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of ground water resources.
- To contain soils and materials within demarcated areas and prevent contamination of storm water runoff.
- To minimise the loss of natural vegetation.
- To prevent the proliferation of alien invasive plant species.
- To protect the wildlife and bird species.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.
- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive mine infrastructure, activities and facilities.
- To ensure that all traffic generated by the proposed mining development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve the historical and cultural artefacts located on site in compliance with the South African Heritage Resources Act, 1999 (Act No. 25 of 1999).
- To ensure that the current socio-economic status quo is improved.
- To be transparent and practise effective communication; in order to maintain good relationships with all interested and affected parties.

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

Table 24: Mitigation and control measures related to compliance with standards.

ACTIVITY Whether listed or not listed (e.g. excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water suppy dams and boreholes, accommodation, offices, ablution, stores, workshops, processing lant, storm water control, berms, roads, pipelines, power lines, conveyors, etc… etc… etc…)	POTENTIAL IMPACT (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc… etc…)	MITIGATION TYPE modify, remedy, control or stop (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc… etc…) (e.g. modify through alternative method. Control through management and monitoring through rehabilitation.)	POTENTIAL FOR RESIDUAL RISK
Ablution facilities (Septic Tanks)	• Soil contamination • Groundwater contamination • Odours	• Maintenance of septic tanks on regular basis. • Removal of containers upon closure.	Very low
Clean & Dirty water system	• Surface disturbance • Groundwater contamination • Soil contamination • Surface water contamination	• Maintenance of berms and trenches. • Oil traps used in relevant areas. • Drip trays used. • Immediately clean hydrocarbon spill.	Low/Medium
Diesel tanks	• Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Maintenance of diesel tanks and bund walls. • Oil traps. • Groundwater quality monitoring. • Drip tray at re-fuelling point. • Immediately clean hydrocarbon spill.	Medium
Opencast Alluvial Diamond mining	• Dust	• Access control • Dust control and monitoring	Medium

	• Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Groundwater quality monitoring • Noise control and monitoring • Continuous rehabilitation • Stormwater run-off control • Immediately clean hydrocarbon spill • Drip trays • Erosion control	
Generators	• Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Access control • Maintenance of generator and bund walls • Noise control and monitoring • Oil traps • Groundwater quality monitoring • Immediately clean hydrocarbon spill	Medium
Office – Pre-fabricated office blocks on concrete	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Very low
Parking bay	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Processing plant	• Dust • Noise • Groundwater contamination	• Access control • Maintenance of processing plant • Dust control and monitoring	Medium

	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Groundwater quality and level monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Water distribution Pipeline	• Surface disturbance • Possible Groundwater contamination • Soil contamination • Surface water contamination	• Maintenance of pipes.	Low
Roads	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Maintenance of roads • Dust control and monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Salvage yard	• Possible Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Access control • Maintenance of fence. • Stormwater run-off control • Immediately clean hydrocarbon spill	Low
Stockpile area	• Dust	• Dust control and monitoring • Noise control and monitoring	Low

	• Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Topsoil storage area	• Dust • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil disturbance • Surface disturbance	• Dust control and monitoring • Stormwater run-off control. • Continuous rehabilitation • Rip disturbed areas to allow re-growth of vegetation cover • Backfilling of topsoil during rehabilitation	Low
Waste disposal site	• Groundwater contamination • Surface water contamination	• Storage of waste within receptacles • Storage of hazardous waste on concrete floor with bund wall • Removal of waste on regular intervals.	Low
Mine Residue Deposit – Slimes	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Stormwater run-off control. • Rip disturbed areas to allow re-growth of vegetation cover	Low
Wash bay	• Possible Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination	• Groundwater quality and level monitoring • Concrete floor with oil/water separator • Stormwater run-off control • Immediately clean hydrocarbon spills	Low
Water tank:	• Orange river water and usage	• Monitor water quality and quantity	Low

It is anticipated that the operation will establish 3 x 10 000 litre water tanks with purifiers for potable water.	• Surface disturbance	• Maintenance of tanks (check for leaks).	

l) Other 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 107 of 1998). The EIA report must include the:-

1. Impact on the socio-economic conditions of any directly affected person (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

The socio-economic conditions of the local community could be affected in two ways:

- Negative impacts to the welfare of the residents and workers through general nuisance, dust generation, damages to properties and any associated potential safety risks.
- Positive impacts through job creation and local business opportunities.
- The consultation with interested and affected parties is on-going and any issues, concerns or comments will be considered and included in the EIA report and control measures will be presented in the EMP report.

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Due to the extensive mining activities that has taken place on Bufflesbank the probability that there are any significant heritage or cultural sites are highly unlikely. However, if any heritage resources are uncovered the area will be demarcated as a no-go zone and a specialist will be contacted.

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

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

There are no alternatives, as the applicant is the holder of the mining right on the property and this report is for the application for the renewal of the mining right.

The mining operation will provide ±12 - 25 jobs and will also add to the increased economic activity and the area surrounding the farm.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR area adhered to e.g. rehabilitation.

v) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

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

_____
Signature of the EAP

DATE: _____

w) UNDERTAKING REGARDING LEVEL OF AGREEMENT

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

_____
Signature of the EAP

DATE: _____

-END-

Appendix 1

DIE UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT

THE UNIVERSITY OF THE ORANGE FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Magister in Omgewingsbestuur

Master in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ROELINA HENRIËTTE OOSTHUIZEN

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEël VAN DIE UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

VISEKANSELIER/VICE-CHANCELLOR

DEKAAN/DEAN

REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2000-09-16

APPENDIX 2

CURRICULUM VITAE

Roelina Henriette Oosthuizen

Cell: 084 208 9088

E-Mail: roosthuizen950@gmail.com

1. PERSONAL INFORMATION

Name: Roelina Henriette Oosthuizen

Surname: Oosthuizen (Maiden: Alberts)

Identity number: 7004180037082

Date of birth: 18 April 1970

Gender: Female

Marital status: Married (26 years) with 3 children

Driving license: Yes, Code EB

Languages: Fluent in Afrikaans and English

Nationality: South African

Criminal offences: None

Health: Excellent, fit

2. SYNOPSIS OF PROFESSIONAL CAREER

Roelina Henriette Oosthuizen has 22 years of experience in the environmental management field. She started her career in the area of Environmental Management and Environmental Impact Assessment (EIA) evaluation in 1997 at the Department of Minerals and Energy. After moving to industry in 2005, Roelien became involved in the practical aspects of environmental management. A major project during her early years outside of government was that of the EIA for a Game Reserve and Lodge development near Barkly-Wes, she did this project together with a consultancy firm from Kimberley AWS water solutions (Mr. Adriaan du Toit). In 2007 the Company she worked for was bought by a Canadian Group of Companies and she became more involved in practical aspects of the operations and worked closely with operations personnel in dealing with ongoing management of environmental impacts at the Mine (e.g. monitoring, auditing, operating procedures). She was also centrally involved in liaison with the authorities and with stakeholders in neighbouring areas.

During her time at the Canadian Group of Companies, Roelien was the environmental manager overseeing operations in the Barkly-West, Prieska and Douglas areas. She was responsible for preparing the environmental compliance documents for each operation which included Performance Assessments (Audit reports) and Financial Quantum submissions as well as new applications for Prospecting Rights and Mining Rights with the relevant Scoping, EIA / EMP documents. Her activities included liaison with stakeholders and also with the relevant Departments. During this time, Roelien became increasingly involved in environmental policy and strategy work, as well as the environmental aspects of corporate governance.

She has assisted a range of clients with Environmental Due Diligence audits and compliance audits. Roelien has also undertaken numerous environmental audits, particularly compliance and due diligence audits for clients in the mining industry. Thus, she is familiar with best practice standards in environmental auditing.

Roelien have also represented the South African Diamond Producers Organisation (SADPO) on the Environmental Policy Committee (EPC) at the Chamber of Mines between 2005 and 2011.

In a nutshell, Roelien has wide ranging experience and is thus well-positioned to assist clients in any matter related to sustainability and environmental management. This is achieved through her own skills base and on drawing on specialists.

3. QUALIFICATIONS

MEM (Master in Environmental Management) University of the Orange Free State (2000)
B – Comm NWU (1991)

4. TRAINING COURSES

Roelien have attended various mining and environmental conferences and seminars to stay abreast with the latest changes in legislation, legal compliance and policy positions in the sector.

October 1997	Mineral Laws Administration & Environmental Management (University of Pretoria)
July 2002	Project Management for Environmental Systems (University of the Orange Free State)
August 2004	Environmental and Sustainability in Mining Minerals and Energy Education and Training Institute (MEETI)
September 2005	Converting Old Order Rights to New Order Rights in Mining International Quality & Productivity Centre Johannesburg)
November 2006	Mine waste disposal and Achievement of Mine Closure
February 2007	Introduction to ArcGis 1
April 2010	Mining Law Update Conference (IIR BV South Africa)
November 2010	Social Labour Plans for Mining Workshop (Melrose Training)
August 2011	Mineral Resources Compliance and Reporting (ITC)
May 2012	Enviro Mining Conference 2012 (Sustainability and Rehabilitation) (Spectacular Training Conferences)
August 2012	Mineral Resources Compliance and Reporting 4th Annual (ITC)
March 2013	1st EnviroMining-Ensuring Environmental Compliance and reporting
March 2014	4th Annual EnviroMining Conference
March 2015	5th Annual EnviroMining Conference
February 2018	Seminar by the Department of Environmental Affairs on knowledge sharing workshops on the Screening Tool
August 2020	SAHRA Workshop for EAP's and Heritage Practitioners
October 2020	IAIAsa Simposium

5. PROFESSIONAL REGISTRATION

Registered as a professional at IAIAsa (International Association for Impact Assessment South Africa). IAIAsa is a voluntary organisation and is not a statutory body regulating the profession. Its members are however expected to abide by the organisations code of ethics.

6. PROFESSIONAL EXPERIENCE

Projects are listed below by area of expertise.

Environmental Management Systems (EMS) and Environmental Auditing

Development of EMS and Compilation of INCIDENT REPORT AND INVESTIGATION FORMS for the EMS of the Canadian group of Companies on various sites.

Undertaking of a range of due diligence and performance audits for operations, including those listed below:

Performance Assessment reports for a mining company with various infrastructure and mining operations near Barkly-West and Windsorton.

Performance Assessment reports for a mining company near Douglas.

Preparation of an environmental auditing checklist / protocol for a Community project with restitution ground in assisting the community to determine environmental legal compliance at their operations.

Environmental audit as part of a closure with Dr. Betsie Milne another specialist. This Annual Rehabilitation Plan has been developed to match the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).This project had the objective of ensuring that this company are accounting for environmental liabilities and risks adequately. The plan distinguishes between (a) those environmental rehabilitation liabilities pertaining to drilling, for which the Company was legally responsible and (b) those environmental rehabilitation liabilities pertaining to historic mining activities, for which the Company is not legally responsible, but consider performing as part of their best practice environmental principals. Three costing scenarios were explored in order to evaluate the most feasible rehabilitation plan, i.e. (1) Total cost (worst-case scenario) including risks, (2) legally required cost and (3) features currently available that do not involve any risks.

Sustainability projects: policies, guidelines, strategies and performance reporting

Involved in the compilation of 43-101 technical documents for listed companies which included information on sustainability and performance in rehabilitation and sustainable mining.

Alien species eradication project guideline and strategy near Barkly-Wes in terms of Regulations that have been promulgated in terms of the Conservation of Agricultural Resources Act, No. 43 of 1983 further make it unlawful to allow various species of weeds and invader plants to grow. The target species was Wild tobacco (declared weed), Pink Tamarisk (declared weed) and Mexican poppy, it also involved the community for job creation and training (2008).

Investigations for a Company near Prieska on Development of a biodiversity offsets policy for the applications for forestry tree licences for protected tree species.

Strategic Environmental Studies and Environmental Impact Assessment (EIA)

Undertaking of a Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006 for a Private Individual which involved the proposed extension of a roof over an existing deck with two wood pillars by means of the excavating of 0.5m X 0.5m X 1m X 2 (½m²) OF SOIL WITHIN 100M OF THE HIGH WATER MARK OF THE SEA. A Positive Record of Decision (ROD) Granted (2010).

Undertaking of an ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) near Boshof for a kimberlite Diamond Mining Company (2015)

Undertaking of a strategic environmental review and amendment for a Chinese group of Companies near Postmasburg. The study provided baseline environmental information and a high-level review of the potential impacts of various components of the development (2014 – 2016). Roelien worked as a member (EAP) of a large team consisting of a project Coordinator, attorneys, water specialists, other specialist and an engineer.

Environmental Impact Assessments for various developments including the proposed mining project for the former retrenchees of De Beers in Kimberley. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialist with contributions of specialist reports to compile the EIA EMP report (2017). Roelien worked as a member (EAP) of a team consisting of De Beers (attorneys and environmentalists), the retrenchees, the appointed contractor, EKAPA, and specialist appointed for the studies.

Environmental Impact Assessments for a Salt operation near Upington. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as part of a team with the Company and another consultant that started with the Water Use Licence application. The public participation was done to include the water use activities.

Environmental Impact Assessment for a change in scope of a prospecting right application consisting of the sole and exclusive right to prospect for iron, silver, zinc,

copper and sulphur ore. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as a member (EAP) of a team consisting of the directors of the company and specialists appointed for the studies

7. CAREER PATH

01 April 1997 to 28 February 2005
DEPT OF MINERALS & ENERGY
Senior Environmentalist - Assistant Director Environment

MAIN JOB FUNCTIONS

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate and prioritise the rehabilitation of derelict and ownerless mines.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water Affairs and Forestry, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Conduct inspections and recommendations on mines that apply for closure.
- Evaluate mining licences and prospecting applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on environmental matters, legislation and agreements.
- Influence new development processes through participation in the EMPR and EIA processes and give guidance through education and awareness programmes.
- Calculate and verify financial provision for outstanding rehabilitation.

01 March 2005 – 30 September 2012
Appointed as professional Mineral Law Administration and Environmental Manager for HC van Wyk Diamonds which was bought over in 2007 by a **Canadian group of Companies.**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans:
Formulation of an environmental policy and guidelines for the Group.
Participation in the development of the budget for environmental expenditure.
Co-ordination of technical studies (e.g. monitoring of groundwater quality).
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. Forestry Licences and water sampling for Water Use Licences).
Development of environmental guidelines for contractors on sites.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to Present
Appointed as professional Mineral Law Administration and Environmental Manager for **Mentor Trade and Investments Pty Ltd**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Formulation of an environmental policy and guidelines for the Mine.
Co-ordination of technical studies (e.g. monitoring of groundwater quality) as well as updating of the Mine's IWWMP.
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. as water sampling and effluent).
Development of environmental guidelines for contractors.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to Present part time
Appointed as EAP on some projects for ***Wadala Mining and Consulting Pty Ltd***

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Liaison with regulatory authorities on compliance with environmental legislation.
Environmental awareness and training.