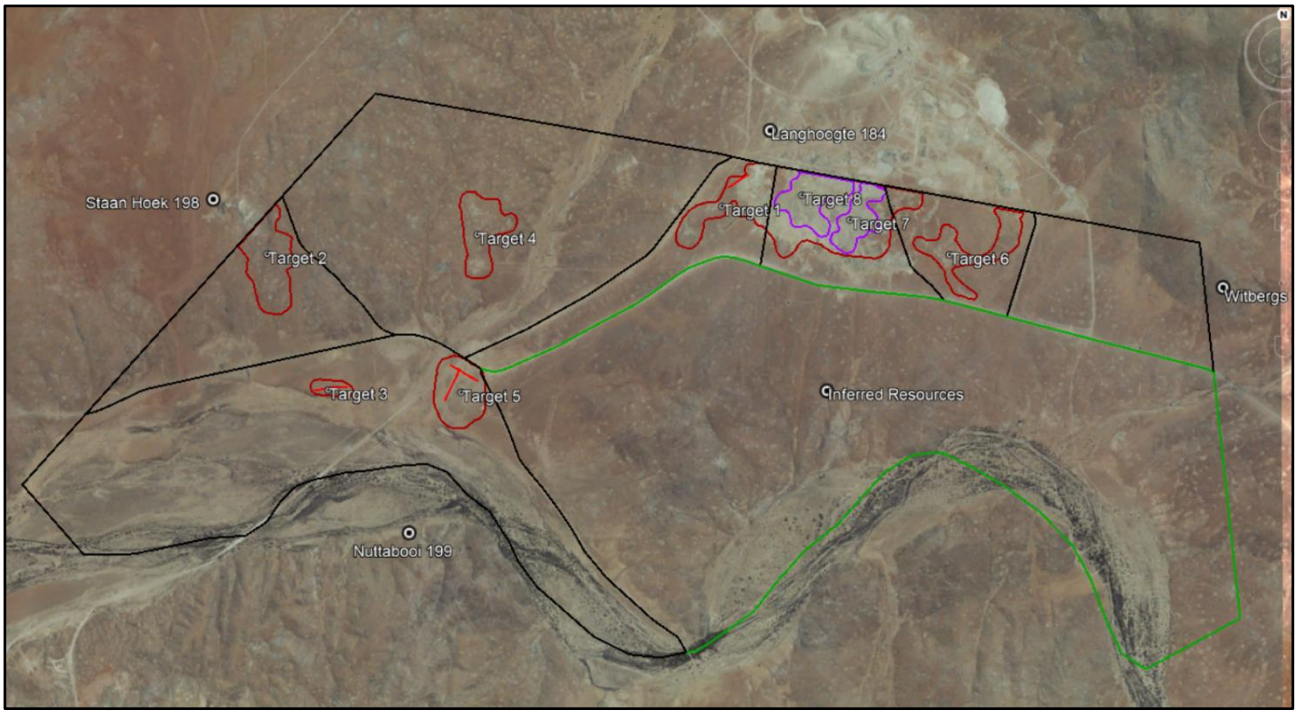

Draft Environmental Impact Assessment Report

The Mining Right Application on Farm Wolfberg 187 for Kasimira Trading 82 (Pty) Ltd, Nama Khoi Local Municipality, Namakwa District Municipality, Northern Cape

DMR REF. NO.: NC 30/5/1/2/2/10194 MR

13 October 2021

Draft Report

DOCUMENT NAME:

The Mining Right Application on Farm Wolfberg 187 for Kasimira Trading 82 (Pty) Ltd, Nama Khoi Local Municipality, Namakwa District Municipality, Northern Cape

PROJECT NUMBER:	**DATE:**	**REPORT STATUS:**
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CARRIED OUT BY:

GroenbergEnviro (Pty) Ltd

AUTHOR(S):

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PREPARED BY:

GroenbergEnviro (Pty) Ltd

Revision Status

Rev No.	Issue Date	Author	Technical Review	Report Review
0	October 2021	H. Botha	P. Badenhorst	J.A. Barnard

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND MINING.

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:	**Kasimira Trading 82 (Pty) Ltd**
TEL NO:	**082 775 4438**
FAX NO:	**086 544 7074**
POSTAL ADDRESS:	**PO Box 166; Kleinzee; 8282**
PHYSICAL ADDRESS:	**35 5de Straat; Kleinzee; 8282**

DMR REFERENCE NUMBER: NC 30/5/1/2/2/10194 MR

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
(b) describe 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 the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
(d) determine the—-
    (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    (ii) degree to which these impacts—
        (aa) can be reversed;
        (bb) may cause irreplaceable loss of resources, and
        (cc) can be avoided, managed or mitigated;
(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
(g) identify suitable measures to manage, avoid or mitigate identified impacts; and
(h) identify residual risks that need to be managed and monitored.

Statement of Independence

GroenbergEnviro (Pty) Ltd (GBE) has no interest in the outcome of this report, nor does this company have any interest that could be reasonably regarded as being capable of affecting its independence.

Disclaimer

The opinions expressed in this report have been based on the information supplied to GBE by the Applicant. GBE has exercised all due care in reviewing the supplied information, with conclusions from the review being reliant on the accuracy and completeness of the supplied data.

GBE does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them.

Professional environmental opinions presented in this report apply to the site conditions and features as they existed at the time of GBE's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this report, about which GBE had no prior knowledge nor had the opportunity to evaluate.

EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

NAME	Helene Botha	Pieter Badenhorst
RESPONSIBILITY ON PROJECT	Preparation of Environmental Impact Assessment Report, Public Participation Documentation, Final Closure, Decommissioning and Rehabilitation Plan	
QUALIFICATIONS	B. Sc. (Zoology & Genetics) B. SC. Hons. (Animal Behaviour) M. Env. Man (Masters' Degree in Environmental Management)	B. SC. B. Eng. (Civil) M. Eng. (Irrigation) B. Hons. (B&A) MBA
PROFESSIONAL REGISTRATION	Registration with Environmental Assessment Practitioners Association of South Africa (EAPASA): Reg. No.: 2019/558.- in progress	Professional Engineer, member of the Engineering Council of South Africa Member of the South African Institute of Civil Engineers Member of the International Association of Impact Assessment (South Africa) Registration with Environmental Assessment Practitioners Association of South Africa (EAPASA): Reg. No.: 2019/1108– in progress
EXPERIENCE (YEARS)	6 years	47 years
EXPERIENCE & EXPERTISE	The consultant has more than 6 years of experience in project management and reports writing. Miss Botha has worked on numerous Environmental Impact Assessments, Basic Assessments, S24G Rectifications, and Water Use Licenses and has considerable experience in the preparation and compilation of Environmental Impact Reports, Environmental Management Programmes, and project management. Refer to CV Summary attached at **Appendix A, page 125**.	The consultant has more than 47 years of experience in project management and reports writing. He worked at the CSIR in environmental and estuarine management for 16 years. During that time, he was part of the team that developed coastal management guidelines; the first process for EIA's and undertook numerous environmental studies for DEAT in collaboration with a team of ecologists. The past couple of years he has worked mainly in environmental control and environmental impact assessments and has completed EIAs for many projects. He has also attended an EIA peer review on a major development for DEAT and is a member of IAIAsa. The practitioner has attended or organised many meetings/workshops/open days to identify issues for similar projects at the CSIR; Blue Flag for DEAT as well as other DEAT projects. The Blue Flag and other projects required interaction with large groups of stakeholders. Refer to CV Summary attached at **Appendix A, page 125**

DECLARATION OF INDEPENDENCE

I, Pieter Badenhorst, declare that –

- I act as the independent environmental assessment practitioner in this role as EAP;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the role of EAP in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the reports comprising the Environmental Impact Assessment;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the Competent Authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and,
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;
- ~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~

Signature of the Environmental Assessment Practitioner

Name of Company: GroenbergEnviro (Pty) Ltd

Date: 13 October 2021

DEFINITIONS

Alternatives - In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –
i. The property on which or location where it is proposed to undertake the activity;
ii. The type of activity to be undertaken;
iii. The design or layout of the activity;
iv. The technology to be used in the activity, and;
v. The operational aspects of the activity.

Aquifer - A formation, group of formations, or part of a formation that contains sufficient saturated permeable material to store and transmit water; and to yield economical quantities of water to boreholes or springs. An aquifer is the storage medium from which groundwater is abstracted.

Baseline - Information gathered at the beginning of a study which describes the environment prior to development of a project and against which predicted changes (impacts) are measured.

Biodiversity - The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity.

Borehole - Includes a well, excavation, or any other artificially constructed or improved groundwater cavity which can be used for the purpose of intercepting, collecting or storing water from an aquifer; observing or collecting data and information on water in an aquifer; or recharging an aquifer.

Community - Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities and other occasional users of the area.

Construction Phase - The stage of project development comprising site preparation as well as all construction activities associated with the development.

Consultation - A process for the exchange of views, concerns and proposals about a project through meaningful discussions and the open sharing of information.

Critical Biodiversity Area - Areas of the landscape that must be conserved in a natural or near-natural state in order for the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.

Cumulative Impacts - Direct and indirect impacts that act together with current or future potential impacts of other activities or proposed activities in the area/region that affect the same resources and/or receptors.

Environment - The surroundings within which humans exist and that are made up of
i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;
iii. Any Part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Authorisation (EA) – The authorisation by a competent authority of a listed activity.

Environmental Assessment Practitioner (EAP) – The person responsible for planning, management and co-ordination of environmental impact assessment, strategic environmental assessments, environmental management plans or any other appropriate environmental instrument introduced through regulations.

Environmental Impact Assessment (EIA) – In relation to an application to which scoping must be applied, means the process of collecting, organizing, analysing, interpreting and communicating information that is relevant to the consideration of that application. This process necessitates the compilation of an Environmental Impact Report, which describes the process of examining the environmental effects of a proposed development, the anticipated impacts and proposed mitigatory measures.

Environmental Impact Report (EIR) - A report assessing the potential significant impacts as identified during the Scoping phase.

Environmental Management Programme (EMPr) - A management programme designed specifically to introduce the mitigation measures proposed in the Reports and contained in the Conditions of Approval in the Environmental Authorisation.

Gross Domestic Product (GDP) by region - represents the value of all goods and services produced within a region, over a period of one year, plus taxes minus subsidies.

Groundwater - Water found in the subsurface in the saturated zone below the water table. Groundwater is a source of water and is an integral part of the hydrological system.

Hydrocarbons – Oils used in machinery as lubricants, including diesel and petrol used as fuel.

Hydrogeology - In South Africa, the term geohydrology and hydrogeology are used interchangeably. In theory hydrogeology is the study of geology from the perspective of its role and influence in hydrology, while geohydrology is the study of hydrology from the perspective of the influence on geology.

Impact - A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.

Interested and Affected Party (I&AP) – Any individual, group, organization or associations which are interested in or affected by an activity as well as any organ of state that may have jurisdiction over any aspect of the activity.

Municipality –

(a) Means a metropolitan, district or local municipality established in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998); or
(b) In relation to the implementation of a provision of this Act in an area which falls within both a local municipality and a district municipality, means
    (i) The district municipality, or
    (ii) The local municipality, if the district municipality, by agreement with the local municipality, has assigned the implementation of that provision in that area to the local municipality.

NEMA EIA Regulations - The EIA Regulations means the regulations made under section 24(5) of the National Environmental Management Act (Act 107 of 1998) (Government Notice No. R 982, R 983, R984 and R 985 in the Government Gazette of 4 December 2014 refer as amended by GNR 324, 325, 326 and 327 of 7 April 2017.

No-Go Alternative – The option of not proceeding with the activity, implying a continuation of the current situation / status quo

Public Participation Process (PPP) - A process in which potential Interested and Affected Parties are given an opportunity to comment on, or raise issues relevant to, specific matters.

Registered Interested and Affected Party – All persons who, as a consequence of the Public Participation Process conducted in respect of an application, have submitted written comments or attended meeting with the applicant or environmental assessment practitioner (EAP); all persons who have requested the applicant or the EAP in writing, for their names to be placed on the register and all organs of state which have jurisdiction in respect of the activity to which the application relates.

Scoping process - A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail

Scoping Report – The report describing the issues identified during the scoping process.

Significant impact – Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Spatial Development Framework (SDF) - A document required by legislation and essential in providing conservation and development guidelines for an urban area, which is situated in an environmentally sensitive area and for which major expansion is expected in the foreseeable future.

Specialist study - A study into a particular aspect of the environment, undertaken by an expert in that discipline.

Stakeholders - All parties affected by and/or able to influence a project, often those in a position of authority and/or representing others.

Sustainable development - Sustainable development is generally defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. NEMA defines sustainable development as the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

Visibility - The area from which the project components would actually be visible and depends upon topography, vegetation cover, built structures and distance.

Visual Character - The elements that make up the landscape including geology, vegetation and land-use of the area.

Visual Quality - The experience of the environment with its particular natural and cultural attributes.

Visual Receptors - Individuals, groups or communities who are subject to the visual influence of a particular project.

ACRONYMS AND ABBREVIATIONS

amsl	Above mean sea level
BPEO	Best Practicable Environmental Option
CBA	Critical Biodiversity Area
DEIAR	Draft Environmental Impact Assessment Report
DHSW&S	Department of Human Settlements, Water and Sanitation
DM	District Municipality
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DSR	Draft Scoping Report
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ESA	Ecological Support Area
EStA	Early Stone Age
FoT	"Free on Truck ": means there is no processing and that it's a raw product.
FEIR	Final Environmental Impact Report
FSR	Final Scoping Report
GA	General Authorisation
GBE	GroenbergEnviro (Pty) Ltd
GDP	Gross Domestic Product
GDPR	Regional Gross Domestic Product
Gensets	A genset is a combination of a prime mover, (typically an engine), and an alternator. An engine converts the chemical energy of a fuel to mechanical energy
GGP	Gross Geographic Product
GNR	Government Notice Reference
Ha	Hectares
HIA	Heritage Impact Assessment
HWM	High Water Mark of the sea (see definitions)
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
iWULA	Integrated Water Use License Application
km	Kilometres
km^2	Square kilometres
LED	Local Economic Development
LM	Local Municipality
LoM	Life of Mine
LN	Listing Notice
L/s	Litres per second
LSA	Late Stone Age
m^3	Metres cubed
MAP	Mean Annual Precipitation
MAPE	Mean Annual Potential Evaporation
MASMS	Mean Annual Soil Moisture Stress (% of days when evaporation demand was more than double the soil moisture supply)
MFD	Mean Frost Days
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MSA	Middle Stone Age
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act 107 of 1998 as amended
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act 24 of 2008 as amended by Act 36 of 2014
NEM: WA	National Environmental Management: Waste Act 59 of 1998
NFEPA	National Freshwater Ecosystem Priority Area

NHRA	National Heritage Resources Act 25 of 1999
NWA	National Water Act 36 of 1998
PES	Present Ecological State
RDL	Red Data List
ROM	Run of Mine
S&EIR	Scoping and Environmental Impact Reporting
SAHRA	South African National Heritage Resources Agency
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SLP	Social and Labour Plan
SKEP	Succulent Karoo Ecosystem Programme
StatsSA	Statistics South Africa
WMA	Water Management Area
WML	Waste Management License
WUL	Water Use License

CONTENTS

Tables

1 CONTACT PERSON & CORRESPONDENCE ADDRESS

1.1 Details of the EAP

Name of the Practitioner: Helene Botha (GroenbergEnviro (Pty) Ltd)
Tel No.: 076 509 0785
Fax No.: 086 476 7139
e -mail address: helene@groenbergenviro.co.za

1.2 Expertise of the EAP

The qualifications of the Environmental Assessment Practitioner (EAP)

NAME	Helene Botha	Pieter Badenhorst
QUALIFICATIONS	B. Sc. (Zoology & Genetics) B. SC. Hons. (Animal Behaviour) M. Env. Man (Masters' Degree in Environmental Management)	B. SC. B. Eng. (Civil) M. Eng. (Irrigation) B. Hons. (B&A) MBA
PROFESSIONAL REGISTRATION	Registration with Environmental Assessment Practitioners'' Association of South Africa (EAPASA): Reg. No.: 2019/558.- in progress	Professional Engineer, member of the Engineering Council of South Africa Member of the South African Institute of Civil Engineers Member of the International Association of Impact Assessment (South Africa) Registration with Environmental Assessment Practitioners' Association of South Africa (EAPASA): Reg. No.: 2019/1108– in progress

Refer to **Appendix A, page 125** for the CV of EAP.

2 LOCATION OF THE ACTIVITY

Table 1: Project Location Information

Farm Name:	Farm Wolfberg 187
Application area (Ha)	Ha
Magisterial district:	Namakwaland
District Municipality	Namakwa DM
Local Municipality	Nama Khoi LM
Distance and direction from the nearest town	40km east of Kleinzee
21-digit Surveyor General Code for each farm portion	C05300000000018700000
Locality map	Refer to **Figure 1** and **Figure 2**
Description of the overall activity. **(Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance Permit, Technical Co-operation Permit, Additional Listed Activity)**	Mining Right

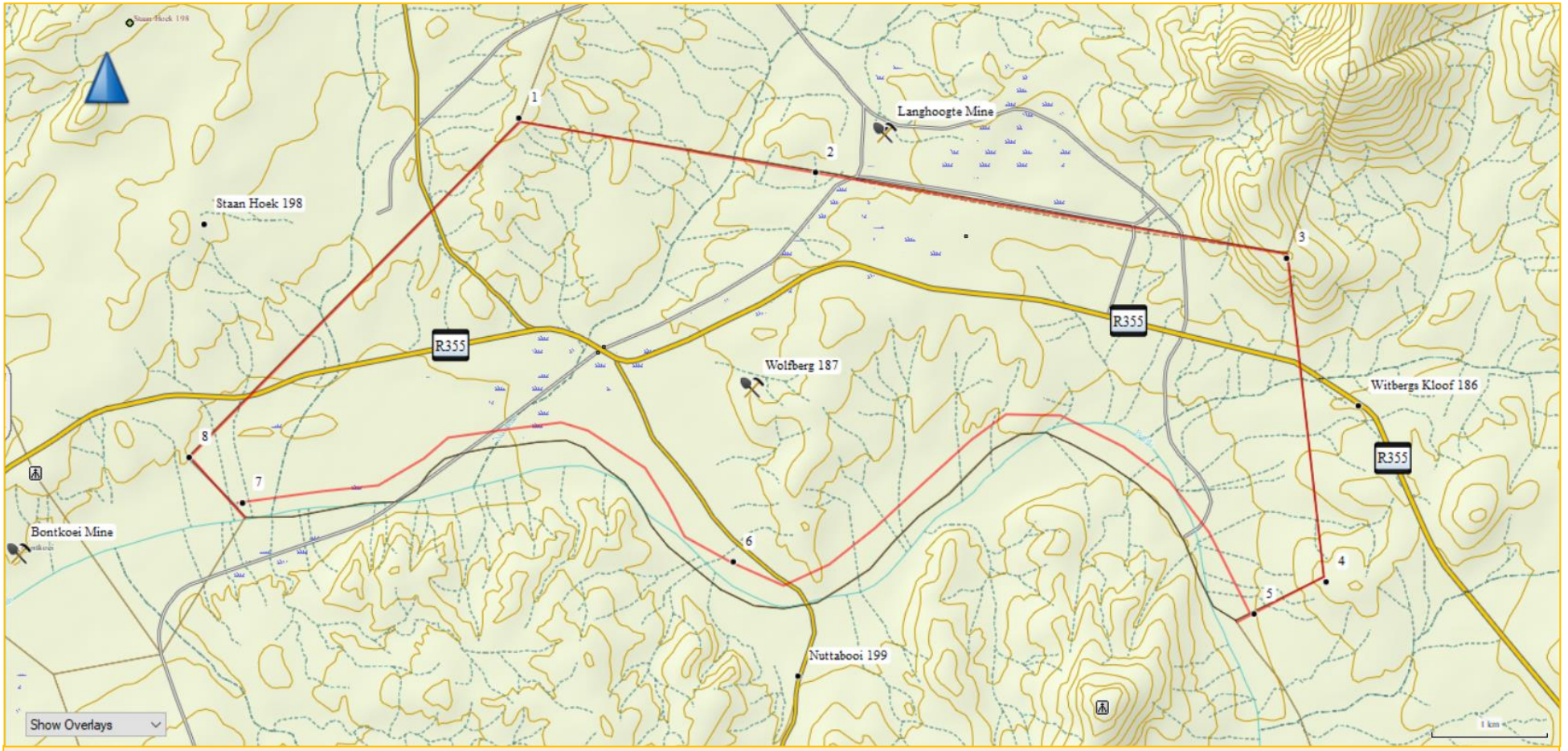
2.1 Location

The mining right application area is located approximately 40km east of Kleinzee and 60km west of Springbok in the Northern Cape Province.

2.2 Locality Map

Refer to the locality plan attached in **Figure 1. Figure 2** shows the properties and coordinates as detailed in **Table 1** above. **Figure 3** shows the existing mining infrastructure.

Figure 1: Locality Plan of Project Site Mining Right Area



MINING AREA

The figure numbered 1, 2, 3, 4, 5, 6, 7, and 8 being the Farm Wolfberg 187 in extend 2199.5742 Ha
District: Namakwaland

Boundary Co-Ordinates

1 S29.52076° E17.38305°	2 S29.52494° E17.40735°
3 S29.53157° E17.44593°	4 S29.55651° E17.44917°
5 S29.55898° E17.44327°	6 S29.55497° E17.40062°
7 S29.55044° E17.36043°	8 S29.54692° E17.35605°

Figure 2: Locality Plan showing Mining Area with Farm Boundaries and Co-ordinates

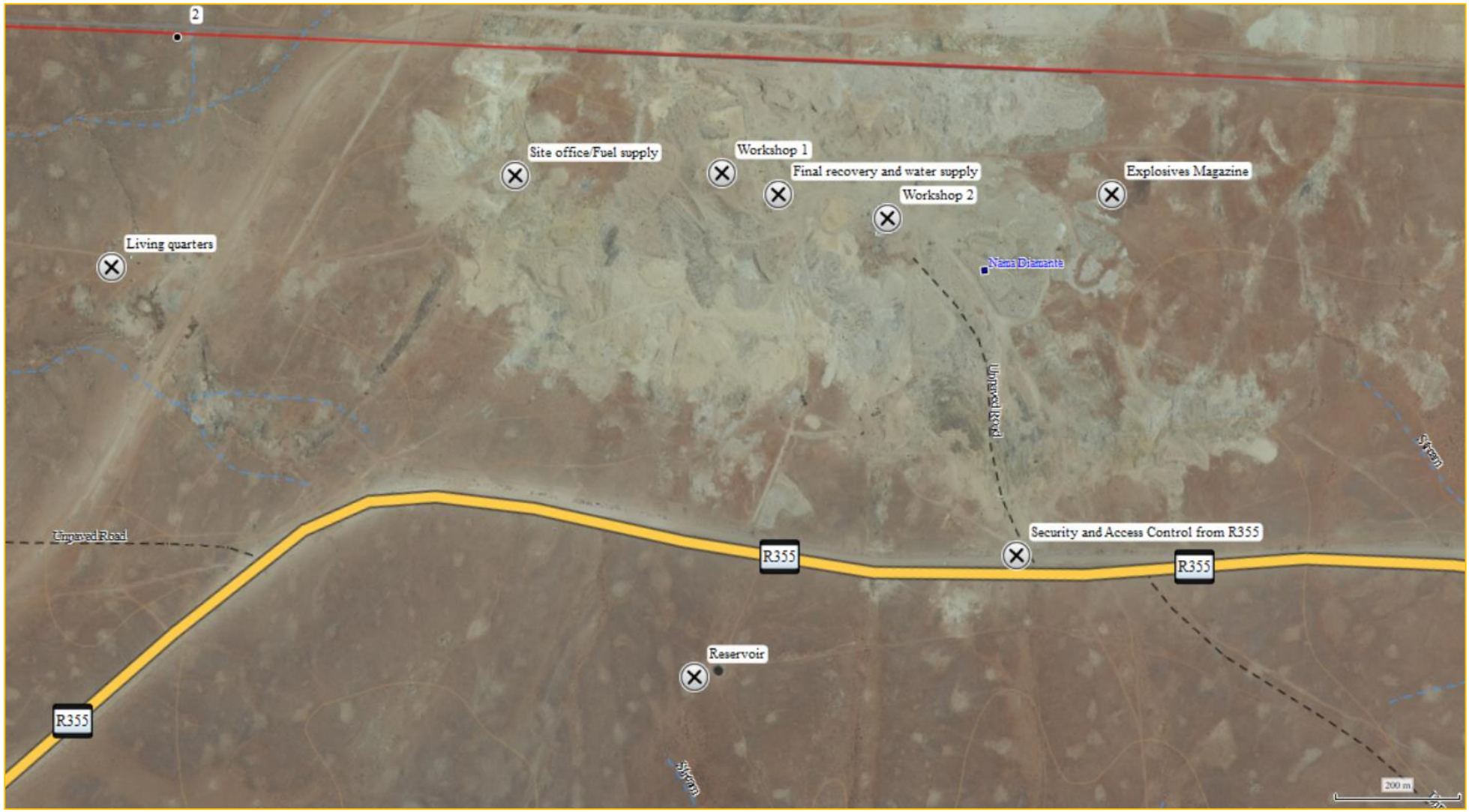


Figure 3: Location of existing mine infrastructure

3 DESCRIPTION OF THE PROPOSED ACTIVITIES

3.1 Introduction and Background

Diamonds have been recovered from the palaeo-gravels of the Buffels River since the late 1950's. This followed the discovery of Namaqualand diamonds at Oubeep in 1926, and the subsequent large-scale mining of diamonds at and around the Buffels River mouth at Kleinzee. Numerous mining operators have produced diamonds at Wolfberg since 1959 and up to the present time. Almost all of the existing occurrences of diamond deposits have been found and delineated historically. There is therefore not much need for exploration on Farm Wolfberg at this stage. The challenges are rather to continue from existing exposures, applying the mining process which has thus far been profitable on Wolfberg.

Most of the remaining in situ diamondiferous gravels and grits are calcified, whether occurring as stratiform units or as a matrix between boulders. The next phase in the production is to gear up for the processing of the consolidated gravels. Admittedly, a lot of the prime material has already been taken out, yet considerable potential remains, especially in the form of these calcified gravels which thus far mining operators have with one exception not been able to process and recover diamonds from.

The applicant Kasimira Trading 82 (Pty) Ltd with Registration number 2010/018273/07 has undertaken extensive prospecting and trail mining (Bulk Sampling) in terms of Section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) over the area applied for under cover of prospecting rights NC 30/5/1/1/2/11298 PR, NC 30/5/1/1/2/12611(10954) PR and NC 30/5/1/1/2/10235 PR. Due to an increase in the scale of the trail mining the applicant now needs to convert the prospecting rights into a single mining right.

With regard to the resource statement, the information supplied in terms of regulation 11 (1) (d) was obtained and is supported by the exploration results obtained during the extensive trail mining (Bulk Sampling) program. The resource was determined by an Experienced Inhouse Mine Manager as well as Exploration reports from Creo Design. The information with regard to the market and market requirements and pricing in terms of regulation 11 (1) (e) is based on the current markets that have been established as part of the trail mining (Bulk Sampling) period. The production and pricing are based on the monthly statistical returns submitted in terms of Section 28 (2) (a) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). The information with regard to applicable timeframes and scheduling of the various implementing phases and estimate of the period required in terms of regulation 11 (1) (f) is based on existing information. The mining area is fully developed with regard to infrastructure and services and is already in production as part of the trial mining phase.

3.2 The Scope of the Proposed Activities

The information in **Table 2** below is referenced from the Mining Works Programme (MWP) (2021).

Table 2: Details of the Mineral Resource (MWP; 2020)

ITEM	DETAIL
Type of mineral	Diamonds Alluvial (DA) & Diamonds General (D) & Gemstones except diamonds (GS) & Stone Aggregate, gravel (St) & Sand (General) (QY).
Locality (direction and distance from the nearest town)	The mining right area lies 40km east of Kleinzee as shown in **Figure 1 above**.
Extent of application	2199.574 Ha Refer to **Figure 2 above**.
Extent of the area required for infrastructure	Infrastructure and mine logistics: 2.5 Ha Access Road: 4.37 km Refer to **Figure 3 above** for the location of the existing infrastructure.
Extent of the area required for mining	**Refer to Figure 5.** Target 1 = 71.2724 Ha Target 2 = 19.6778 Ha Target 3 = 3.2261 Ha Target 4 = 15.5578 Ha

	Target 5 = 16.5630 Ha Target 6 = 16.4020 Ha Target 7 = 10.2091 Ha Target 8 = 14.7922 Ha
Depth of mineral below the surface	The orebody extends between 0.5 m and 3 m below the surface.
Geological formation	The area is underlain by basement rocks of the Namaqua Metamorphic Belt of Proterozoic age and Cenozoic deposits (calcrete, clastic sediments and sand of Quaternary and Tertiary age). The Namaqua metamorphics are comprised mainly of gneissic rocks of the Bushmanland Group that were later intruded on by a variety of granitic rocks. Younger flat-lying unaltered sedimentary rocks of the Nama Group occur as hills throughout this area. The plateau region is partly overlain by the basal Karoo sediments of the Lower Palaeozoic age. Outcrops of Dwyka tillites can be seen and a variable thickness of Kalahari sands of Tertiary to Recent age covers much of the region. **Figure 4** is a regional geology map of the area, (after SACS 1980). Described further in Section 8.1.2 in this Report.

3.2.1 In Situ Resource

The remaining in situ diamond potential of the farm Wolfberg 187 can broadly be divided into the following resource targets (refer to **Figure 5** and **Table 2** above).

1. Resource Target 1: Main mining area

The main mining area, which is centred in the middle of the borderline between Wolfberg and Langhoogte, consists of numerous adjacent boulder gravel pits, some self-enclosed and some in the form of gullies which link up with other depositional features. These remnants of the calcified conglomerates in the big boulder beds within the central mining area is regarded as the highest priority mining targets on a long-term basis. However, these targets need to be blasted and the blasted material reduced to crushable size by hydraulic hammer (excavator pecker). As expected, the highest diamond grades were obtained within the large boulder beds of the central mining area. However, grades in these deposits are very clustered and cannot be extrapolated to adjacent areas.

A large portion of these in situ resources is also covered by “ex-situ” as described in section 3.2.2 below.

2. Resource Target 2: Staanhoek Border

This target lies around the middle of the borderline between Wolfberg and the farm Staanhoek 198. It consists of an approximately 400m wide surficial sheet of ~0.4m thick calcified well-rounded pebble gravel. Minor trenching has been done on the Wolfberg side, but on the Staanhoek side of the fence, De Beers has mined every inch of the deposit down to thoroughly cleaned bedrock. According to verbal sources, De Beers obtained excellent diamond grades from this deposit. Here the thin calcified pebble conglomerate terrace should preferably be carefully scraped together by a bulldozer. Bedrock sweeping is also required. However, this material needs to be crushed as the first stage of processing.

3. Resource Target 3: Drill line 2

Here the calcified cobble gravel can be lifted from the sides of the existing bulldozed trench.

The trench on a low hill to the south of the R355 shows a ~1m thick well-rounded clast-supported cobble gravel, which was presumably preserved by its high degree of calcification. This gravel is interpreted as a primary terrace gravel with good diamond potential.

The gravel body at Target 3 (roughly 250m x 100m x 1m ellipsoid) giving a gravel volume of approximately 20 000 cubic metres (40 000 tonnes).

4. Resource Target 4 Rooihoop

This target lies around the middle of the western half of Wolfberg, and consists of numerous shallow bulldozed trenches, some stockpiles of gravel soil (such as the so-called "Rooihoop") and some pebble-sized tailings from minor processing.

5. Resource Target 5 Crossroads

This gravel is confined to the area directly south-east of the Springbok-Kleinzee - Langhoogte-Nuttabooi crossroads.

6. Resource Target 6: Remainder of Wolfberg

The remainder of Wolfberg consists of various erosional remnants of both primary and secondary cobble-pebble gravel terraces. Processing of calcified resources from the widely spaced gravel terrace remnants and almost any type of material on Wolfberg which contains pebbles or grit of some sort have been found to yield diamonds to some extent. With overburden generally as thin as on Wolfberg, it is not surprising that bedrock outcrop covers a large percentage of the total area. Exploration drilling and trial mining has shown very thin overburden (~0.1 - 0.5m) and the gravel thickness of ~0.1 - 1.5m, except for the large-boulder gravels, which can be up to ~2.5m thick.

Also, with such thin overburden, any underlying gravel usually shows signs of its presence in the form of pebbles visible on the surface. Therefore, most places where gravel occurs have been excavated to some extent or at least exposed to test for thickness, continuity, roundedness and packing density.

3.2.2 Ex Situ Resource

1. Resource Target 7: Calcified gravel blocks

A fair amount of ex-situ calcified gravel blocks is scattered around the mining pits, but unfortunately not gathered into one or two properly situated stockpiles. The exception to this is the calcified pebbly gritstone stockpile in the central mining area.

2. Resource Target 8: Historic tailings dumps

Finally, due to the relatively primitive density separation techniques employed historically (such as pan plants), recovery of diamonds from run-of-mine (ROM) has not been complete, and a significant portion of the diamonds found their way into the tailings

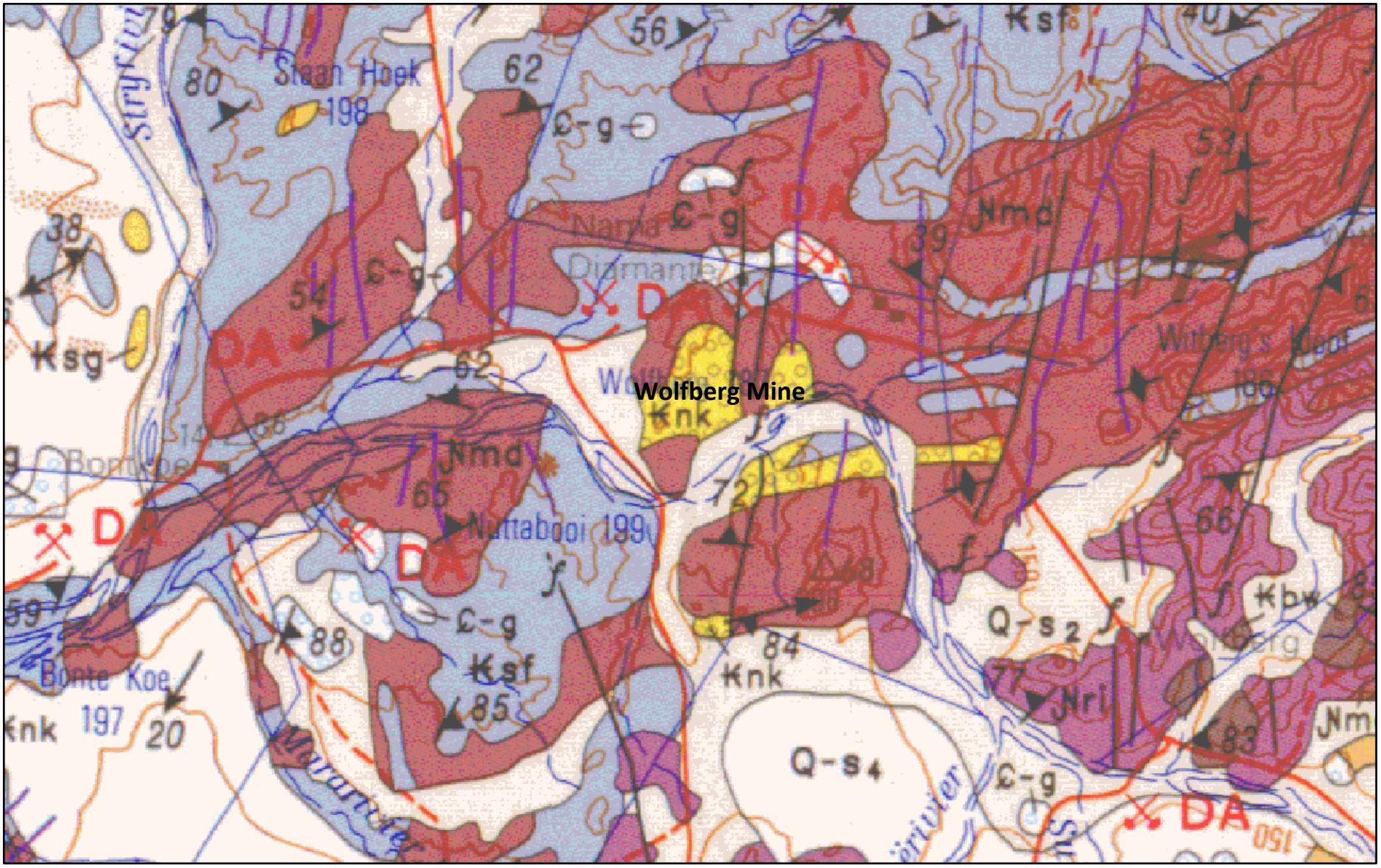


Figure 4: Geological Map providing justification for the possibility that the minerals being applied for could occur on the land.

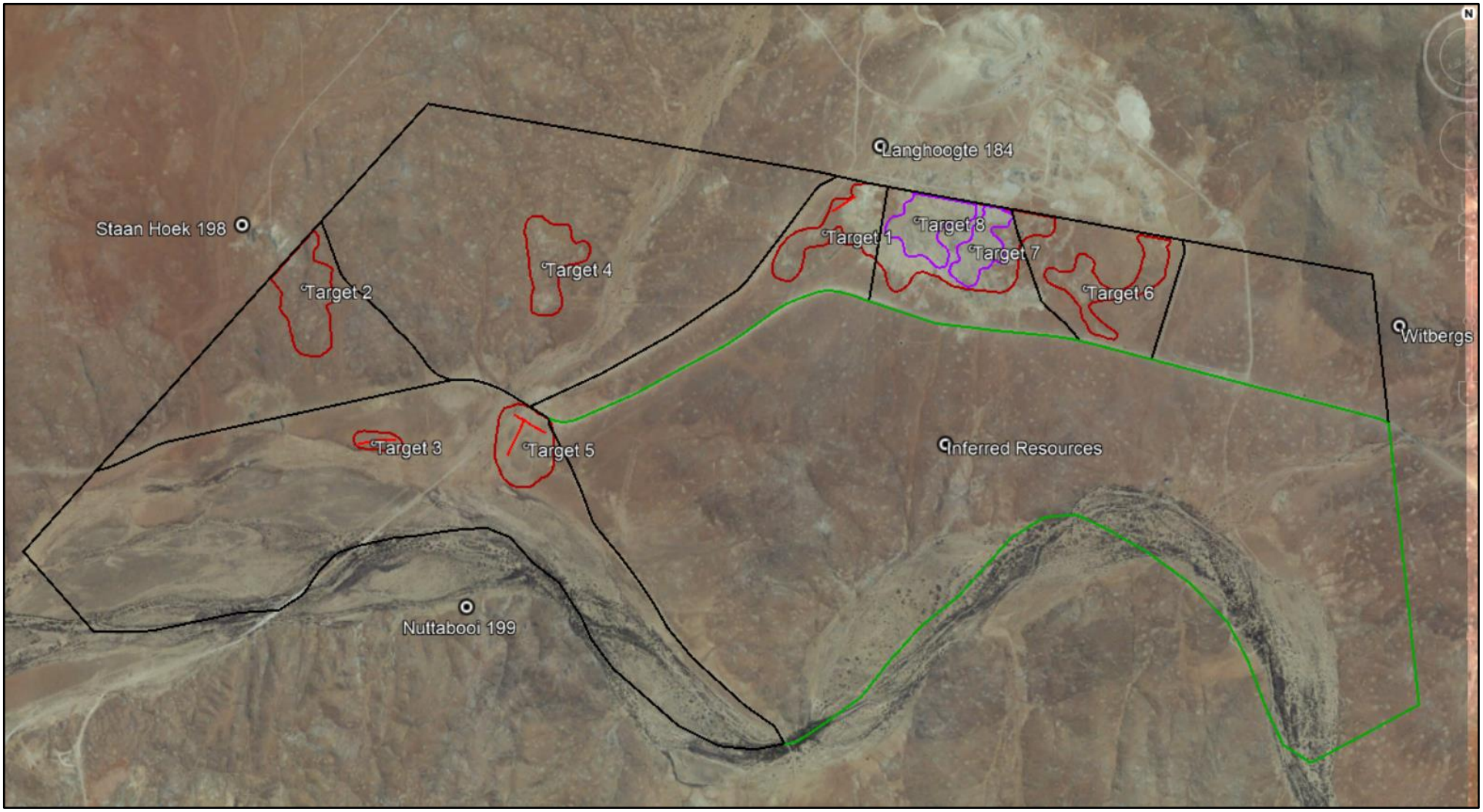


Figure 5: Resource Map showing Target Areas (1 to 6 are "in situ"; 7 and 8 are "ex-situ").

3.3 Project Description

3.3.1 Construction Phase: Development of infrastructure and logistics

Access and Haul roads

The mine is serviced by a well-maintained gravel road the (R335) from Springbok to Kleinzee. Access control is in place at the mine entrance as shown in **Figure 1**, to minimize the travel of locals into the project area and inadvertent contact with large earth-moving vehicles. Haul roads leading between the mine pits and mine logistics are in place. No further access and haul roads are planned. The roads at the mine are located on the reasonably flat stable ground away from streams and rocky areas. 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.

Electricity

Eskom power is available, and the infrastructure area and infield wash plants will make use of this electricity. Only the two water pumps at the boreholes use generators and there is one standby generator.

Water supply

Water is obtained from boreholes present in the mining area and stored in a 45 000-litre reservoir. Supply lines from the reservoir to the logistical facilities and plant needs to be upgraded and underground pipelines demarcated. This storage will also provide an emergency supply for the fire hydrants.

- A Water Use License (Reference 25176121) in terms of Section 21(a) of the National Water Act (NWA) for the abstraction of groundwater for a total of 35 000m³ per year, and the disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21(g) of the NWA, was obtained from the Department of Human Settlements, Water and Sanitation (DHSWS) dated 02/09/2019. A copy of the license is appended in **APPENDIX D: WATER USE GENERAL AUTHORISATION**, page 161.

Mine logistics (refer to **Figure 2**)

- Administration
  The administration complex will be the area from where the mining contractor and relevant technical services personnel will manage the mine. The site covers an area of 2.5Ha. Access to the site will be controlled by security personnel posted at the access gates to the site. The mine site will include offices, change houses, control room, first aid station and stores.
- Accommodation
  No personnel accommodation will be made available as infrastructure is available in the adjacent settlement. Existing infrastructure areas will be used as admin buildings and site offices with public and personnel amenities and sickbay. The farm house will provide accommodation for only security personnel that need to stay on site.
- Workshops
  The secondary infrastructure area will accommodate the waste handling area, earth moving vehicle and engineering workshops, fuel storage facility, wash bay as well as an earthmoving vehicle parking area. A workshop and equipment wash bay for routine maintenance and servicing of equipment is available at the infrastructure area but needs to be upgraded to provide for pollution control measures. All major repairs must be done off-site either in Kleinzee or Springbok. A secured storage area is available at the infrastructure area but needs to be upgraded to provide for pollution control measures.
- Upgrading or developing of solid waste management systems
  Temporary storage area for domestic waste:

  It is not envisaged that large amounts of domestic waste will be generated on the mine. Most of the labour force will be from the surrounding settlements and will only be on-site during their shift. Negotiations will be entered into with the Namaqua District Municipality to ascertain if domestic waste can be disposed of at the registered dump sites. 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 weekly and placed in the designated temporary waste storage area to be constructed from where it will be disposed of at a municipal dumpsite in Kleinzee.

Temporary storage area for industrial and hazardous waste:

Such facilities are required for oil, tyre, and fuel waste handling. The temporary storage area for waste must include a facility for tyres, oil, and fuel waste handling. This facility must 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 must be securely fenced and a separate area must be identified and demarcated (by fences) for the temporary storage of scrap steel and equipment before the sale as scrap. Regular sale and collection of scrap for the site must be arranged.

- Upgrading or developing of water pollution management facilities
  Sewage plant

  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 a service and process make up water. These facilities exist at present but will require upgrading.

  Pollution control dams and evaporation ponds

  Due to the extremely low rainfall, high evaporation rate, permeability of the soils, the use of septic tanks and the lack of pollutants used in the mining process, no stormwater management system or pollution control evaporation dams will be required.

  Polluted water treatment facilities

  There are no pollutants other than oil and diesel used in the mining operation. As such no polluted water treatment facility is provided. No settling ponds for the fine residue is required as dewatering screens and cyclones are used as part of the water recycling programme.

  Oil/grease/diesel management system

  Oil (new and used) and grease must be stored in areas provided with concreted floors and bund walls of sufficient height to contain the full volume of oil.

  All workshop apron areas for servicing large equipment must be provided with oil traps from which oil can be bailed out.

  The diesel generator room must be provided with bund walls and an oil trap to stop all oily run-offs from the concrete floor. All such areas when degreased must be worked into the oil trap and degreasing should preferably be done using one of the Spillsorb type products.

  When equipment must be serviced elsewhere on the mine, care must be taken not to spill oil into the soil through the use of drip trays and proper funnels and containers to catch drained oil. If such spill occurs the soil must be removed to drums and hauled as waste for disposal by Oilkol. Any remaining contaminated soil shall be treated in-situ with Spillsorb or a similar product.

  All diesel tanks are to be bunded and provided with a concrete apron which from time to time is degreased with Spillsorb type product. Any diesel contamination of soils at mobile generators to be removed and residual soil to be treated with Spillsorb or similar product.

- Stormwater
  As Africa is a water-scarce continent and mining activities often pose significant water pollution risks, 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 greywater 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 stormwater run-off to natural drainage channels and to collect dirty run-off and route the dirty water to suitable evaporation dams.

- Security and access control

Perimeter fence

A site perimeter fence is in place for safety and security purposes. The fence should be able to restrict access to livestock and other animals as well as perturb persons from any unauthorised access.

Access control

Access to the area is gained through a dedicated vehicle gate. A security house will be located at the main entrance to the mining site area. Access to the complex by outside service providers will be strictly controlled, and where possible, limited to delivery at the main stores.

- Project Services
  Medical Emergencies

  A first aid station will be available at the mine site for the first response to any medical emergency on the mine. This facility will be equipped for the treatment of minor to medium severity medical emergencies and will serve as a first response/stabilisation facility for major medical emergencies. Patients will be transported from here to the nearest hospital for further treatment should it be required.

- Firefighting
  A firefighting truck will form part of the project services vehicles and will be utilised to respond to fires in the Project Area. A waste handling and dispatch facility will also form part of the mine site and will allow for the collection of all types of waste generated by the operation and transported to suitable disposal facilities in the area.

- Information Technology (IT) and communication
  Lastly, IT and communication infrastructure will be installed at the mine site to allow for the effective capture and management of relevant information and ensure clear and effective communication across the Project site and with the outside world.

3.3.2 Operational Phase: Basic Overview of the mining method

Mining is to take place as a continuation of current bulk sampling surface mining and entails:

- Removal of overburden above the diamond-bearing gravels by an excavator to expose the diamondiferous gravels which overlie the bedrock;
- Removal of the diamondiferous gravels which will be sent to the plant for processing and diamond recovery;
- Sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing; and,
- Waste rock and sand to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product.

Indicated resources will be mined together with the proven reserves and the inferred resources will be investigated as the last option for mining.

All In-Situ resources will be mined through current mining methods but the bulk of the ex-situ diamond potential at Wolfberg lies locked up in calcified gravels and will require crushing and of the consolidated (mainly calcified but also slightly silicified) material to liberate the diamonds.

The various combinations of the basic tools for liberating diamonds from calcified gravel matrix which can be chosen from are as follows:

1) Two jaw crushers: one large primary crusher 33 tonnes per hour (TPH) and one smaller secondary crusher (also called "granulator") ~20 TPH with a triple aperture screen and conveyor system for undersize removal and oversize feedback to the granulator.
2) One jaw crusher and one cone crusher: one large jaw crusher (30 TPH) and one medium-sized cone crusher (20 TPH) with a triple aperture screen and conveyor system for undersize removal and oversize feedback to the cone crusher.
3) One jaw crusher and one ball mill: one large jaw crusher (30 TPH) and one large ball mill (20 TPH) with a screen and conveyor in between.

4) One cone crusher and one ball mill: one large cone crusher (30 TPH) and one large ball mill (20 TPH) with a screen and conveyor in between.
5) One jaw crusher, one cone crusher and one ball mill: one large jaw crusher (30 TPH) and one medium-sized cone crusher (20 TPH) with a triple aperture screen and conveyor system for undersize removal and oversize feedback to the cone crusher, as well as one medium-sized ball mill (15 TPH) fed by conveyor.

A 30 TPH Jaw Crusher would comfortably be able to handle a rock particle size of up to 250mm diameter (small boulder size). To supply the jaw crusher with rock material not larger than this size, the calcified gravel (conglomerate) needs to firstly be pried loose from the big boulders in between where it is sitting, and secondly be broken up into pieces smaller than 250mm diameter. For this purpose, a large hydraulic jackhammer (also called a "pecker") fitted to the excavator in place of the bucket is employed. As this is a time-consuming task, the ideal would be that two excavators are employed, one large one for loosening and moving the big boulders and loading the dump trucks, and one smaller one which operates the pecker full-time (blasting of calcified gravel and big boulders should be done as needed).

The reduction ratio of the jaw crushers is generally 1:10, which means that the primary crusher can theoretically reduce the material fed into it from 250mm to 25mm diameter. The secondary jaw crusher can then reduce it further down to a minimum size of 10mm diameter, after screening off the -10mm fraction between the two crushers.

The reason why 10mm is chosen as the minimum crushing output particle size, is so that diamonds up to this size are not fragmented by the crushing process. This size is chosen as an optimum since larger diamonds are extremely rare in the Buffels River diamond size populations.

Fortunately, crushing to a smaller size is not necessary to liberate smaller stones, because the fragmentation of the matrix rock (in this case mainly calcrete) tends to occur along the boundaries between the diamonds and the matrix rock, due to the stark differences in physical properties and lack of surface adhesion between the two substances.

The necessary grizzlies, feed bins, conveyor systems and screens will need to be custom-built for this fragmentation phase of the upgraded processing plant.

Mineral Processing

Material from the 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 discharge 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 either dumped into the relevant open excavations as part of the ongoing rehabilitation process or processed by crushing and screening to be sold as industrial minerals as a by-product.

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

Mine Surface Layouts

Surveying of the excavations is undertaken monthly by the mine surveyor to obtain precise volumes for the Primary gravel, the suspended gravel, the calcrete and the overburden, against which diamond production could be reconciled and grade determined.

Surveying will also be undertaken to obtain precise volumes of remaining dumps per category within the specific block being mined. All areas backfilled and rehabilitated also needs to be surveyed for use in the annual performance assessment and estimation of cost for outstanding rehabilitation.

The efficiency of the process

Alluvial gravels display varying physical properties, from simple free-flowing alluvial gravels well washed by river action, to conglomerates, and sticky ores with different levels of clay or laterite.

The first step in processing conglomerate ore is crushing. This process reduces large run-of-mine lumps into smaller pieces, making them easier to handle, and releases or liberates the diamonds to be recovered in subsequent steps. Crushing is done in stages to “gently” free the diamonds from the conglomerate and produce a target size, usually less than 35 mm, for further processing.

The next step in preparing the ROM is screening. The gravel occurrences at Wolfberg are dry, allowing up-front up-grading by in-field screening. Scrubbing is then used to wash and break down clay lumps present in the ore.

Once the ore is scrubbed it is wet screened to remove unwanted fine material less than 2 mm in size. Diamonds below this size are of little value and are discarded. Collectively, the process of crushing, scrubbing, and screening prepares the ore for the concentration process.

Crushing, screening, and scrubbing constitute the commonly used liberation techniques, but the specific recipe, viz., the extent, the phasing, and the type of process action, in each case, is dictated by the ore type and diamond occurrence.

Scrubbing is required to:

- De-agglomerate the ore and expose locked diamonds.
- Break down clays that may hinder downstream processes.
- Break down compressed ore cakes created by Roll Crushing.

Variables that need consideration include:

- Scrubber solids residence time.
- Scrubber solids to water ratio.
- Medium charge requirements.
- Critical speed.

After liberation, primary concentration is taking place making use of a 16 feet Rotary Pan plant. In a Rotary Pan plant, alluvial gravel and soil are mixed with water to create a liquid slurry called “puddle" which has a density in the 1.3 to 1.5 g/cm³ range. The mix is stirred in the pan by angled rotating “teeth”. The heavier minerals, or “concentrate”, settle to the bottom and are pushed toward an extraction point, while lighter waste remains suspended and overflows out of the centre of the pan as a separate stream of material. The concentrate, representing just a small percentage (average 10%) of the original alluvial gravels, is drawn off for final recovery.

Rotary Pan Plant have the following advantages:

- A lower power consumption.
- Generally lower water consumption, but this depends on the ultra-fines content which must be continuously removed with water.
- Generally, a lower operating cost, depending on how they are built.

However,

- They produce a higher concentrate yield. Astute operators remove 10% or more to compensate for lower efficiencies.
- They pose an enormous security risk.
- They have unacceptably low recoveries, measured on a "life of mine" basis. This is governed as much by the variables inherent to the pan operation, and the necessary human control thereof. While spot efficiencies up to 95% recovery are common in a single stage, long term recoveries quoted can be as low as 70%. In an effort to replace the reliance on the human element for satisfactory efficiency, De Beers identified in excess of 40 variables, many of which would need to be monitored and controlled continuously during operation.

Common key operating criteria include:

- Concentrate tapping - frequency and duration.
- Puddle condition - while viscosity is the relevant criteria, density is more readily measured and is, therefore, used in the field.
- Pan teeth - condition and depth.
- Weir overflow height.
- The rotational speed of the rakes.

Topsoil

The upper windblown sand cover comprises an average 10cm thick layer of loose windblown sand with humus and grass seed that is considered as topsoil. A layer of topsoil ±10cm thick will be removed from the new mining blocks. Topsoil recovered will be stockpiled for rehabilitation of the mining blocks or used to cover the existing mined-out sections continuously as stripping is taking place.

The topsoil stockpiles for rehabilitation of the new mining blocks will be placed next to the excavations.

Overburden

Overburden handling will generally occur along with 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.

Primary gravels

The gravel is removed from the uneven calcrete substrate using an excavator. 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 using 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.

Tailings Waste Management[1]

Material from the ore stockpile is fed into the trommel screen feed bin using a front-end loader. The material is combined with water (groundwater from boreholes) 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. Spoils from hand sorting of diamonds are to be sold as pebbles (Gemstones). Waste rock and sand is to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product. 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,

[1] Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation in GNR 632 of 24 July 2015, as amended by GNR 990 of 21 September 2018.

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 are discharged. 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 ongoing rehabilitation process. Waste rock and sand is to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product.

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

- Generic characteristics of the tailings based on desk-top research, and not on a representative sample analysed by a specialist on waste classification or tailings storage facility design, are broadly commented on below:
  <u>Physical:</u>
  - All In-Situ resources will be mined through current mining methods, but the bulk of the ex-situ diamond potential at Wolfberg lies locked up in calcified gravels and will require crushing and of the consolidated (mainly calcified but also slightly silicified) material in order to liberate the diamonds.
  - Details on the size distribution of the principle constituents; permeability of the material; void ratios of the material; consolidation or settling characteristics of the material under its own weight and that of any overburden; the strength of the material; specific gravity of the solid constituents; the water content of the material at the time of deposition, and other phases in the life of the deposit; and the change in these properties with time, are unknown.

  <u>Mineral content:</u>
  - No information is available on the specific gravity of the residue particles or their impact on particle segregation and consolidation.
  - Classification of tailings waste disposal is undertaken based on the characteristics of the tailings, location and dimensions of the deposit (height, surface area); importance and vulnerability of the environmental components that are at risk; the spatial extent, duration and intensity of potential impacts; and the pollution control measures are determined as a result of the risk analysis.
  - The ore is washed with naturally occurring groundwater, and no chemicals are added.
  - Waste rock and sand to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product.
  - The importance and vulnerability of the receiving environment within the Mining Right area are detailed in Section 8 of this report. There is no vegetation growing within the disturbed areas, as evident in the aerial photographs included in **Figures 1 to 6**.

3.3.3 Decommissioning and Closure Phase

A Final Rehabilitation, Decommissioning and Mine Closure Plan; and an environmental risk assessment report in terms of the Regulations pertaining to the financial provision for prospecting, exploration, mining, or production operations (NEMA Financial Regulation) is completed as part of the EA process.

According to the NEMA Financial provisioning Regulations, the applicant or holder of a right or permit must ensure that the financial provision is, at any given time, equal to the sum of the actual costs of implementing the Final Rehabilitation, Decommissioning and Mine Closure Plan and environmental risk assessment report for a period of at least 3 years forthwith.

The following risk-based criteria and assumptions were used to calculate the final rehabilitation, decommissioning and closure cost:

- Removal of all structures and infrastructure not to be retained by the landowner in terms of section 44 of the MPRDA.
- All fixed assets that can be profitably removed will be removed for salvage or resale.
- Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in cost estimation) and the remaining treated as waste and removed from the site.
- All structures will be demolished and terracing, and foundations removed to the lesser of 500 mm below the original ground level.
- Inert waste, which is more than 500 mm underground, such as pipes, will be left in place.
- A hazardous disposal site will not be constructed, and all hazardous waste will be removed from the site and transported to the nearest licensed facility.
- All services related to the mining operation, water supply lines and storage on-site will have to be demolished; the closure cost is therefore included in this estimate.
- Existing tracks will be used, and no new roads will be developed.
- It is assumed that the post-mining pit stability and waste dump profile will be addressed as part of the operation and necessary remedial actions implemented before closure.
- Most of the infrastructure will remain as farm improvement and post-mining land use will facilitate the development of a solar farm.

Figure 6: Security and Access Control from R355

Figure 7: Mine Logistics

Figure 8: Site Office and fuel supply

Figure 9: Workshop 1 with parking and laydown area

Figure 10: Final recovery and water supply with processing plants and workshop 1 in background

Figure 11: Workshop 2 with parking and laydown area

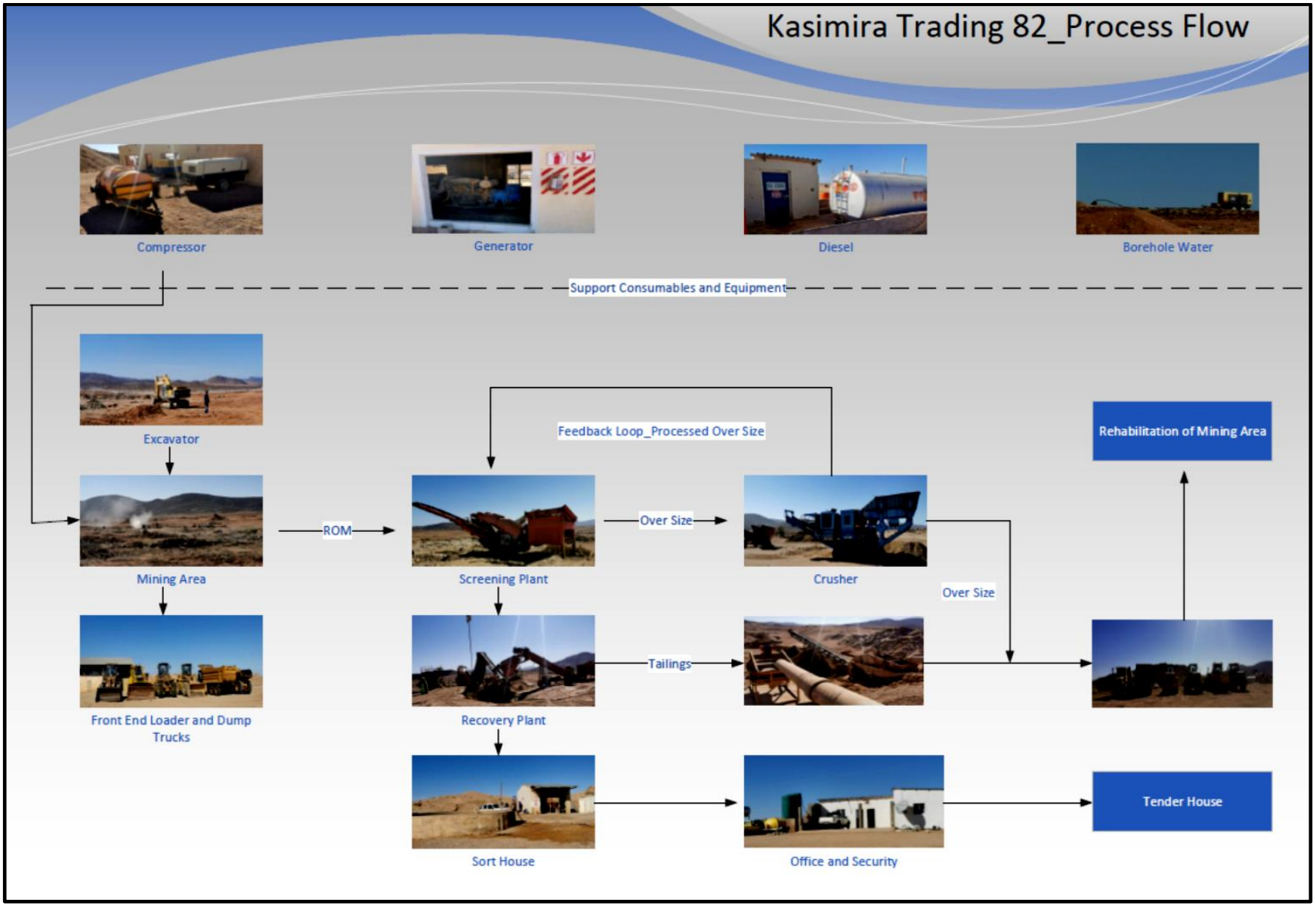


Figure 12: Process Flow Diagram for the Kasimira Mining Right

3.4 Resource statement

A Resource Statement Mine Plan has been prepared within the Mining Right area to yield the following reserve as per **Table 3**:

Table 3: Resource Statement the farm Wolfberg 187

Resource Class	Map Indicator	Area m^2	Resource mbgl Depth	Topsoil m^3	Overburden m^3	Gravel m^3	SG	Gravel Tonnes	Grade CPHT	Possible Carats
In-situ										
Proven Resources	Target 1	712724	2.3	71272	285090	1282903	2.0	2565806	7.5	192435
	Target 2	196778	1.7	19678	78711	236134	2.0	472267	7.5	35420
	Target 3	32261	1.7	3226	12904	38713	2.0	77426	7.5	5807
	Target 4	155578	1.7	15558	62231	186694	2.0	373387	7.5	28004
	Target 5	165630	1.7	16563	66252	198756	2.0	397512	7.5	29813
Indicated Resources	Target 6	164020	1.7	16402	65608	196824	2.0	393648	7.5	29524
Inferred Resources	Exploration to be done									
Ex-situ										
Proven Resources	Target 7	102091	NA	NA	NA	153137	2.0	306273	5.0	15314
	Target 8	147922	NA	NA	NA	221883	2.0	443766	5.0	22188
Total disposed		**1677004**		**142699**	**570796**	**2515043**		**5030086**		**358505**
Available Resource								5030086	tonnes	
Panfeed for financial model at 70% screening factor								1509026	tonnes	
Production rate per year at full operation (Panfeed)								143978	tonnes	
Potential life of mine without downscaling								10	Years	
Recovery /year @ 7.5CPHT used in financial model according to average grade from current production								10798	carats	

3.5 Production build-up period once production commences

Production is calculated at current rates and will stay constant at 479925 Tonne and can only be increased by introducing additional wash plants to increase processing. The production build-up is illustrated in **Table 4** and **Table 5**.

Table 4: Production build-up per year

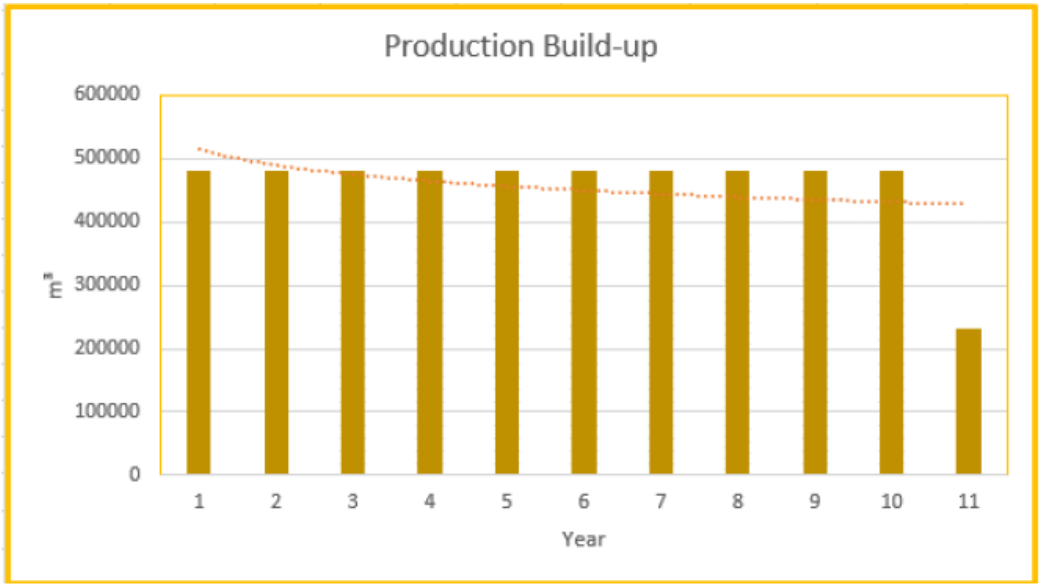


Table 5: Production build up once production commences

YEAR 1 - Full Production													
VOLUME Mt		January	February	March	April	May	June	July	August	September	October	November	December
Panfeed tonnes per hour (1X16 feet pan)		80	80	80	80	80	80	80	80	80	80	80	80
Average hours per day		8	8	8	8	8	8	8	8	8	8	8	8
Panfeed (-25mm) (tonnes/day)		640	640	640	640	640	640	640	640	640	640	640	640
Screen factor % scalping		70	70	70	70	70	70	70	70	70	70	70	70
Mine production ROM (tonnes/day)		2133	2133	2133	2133	2133	2133	2133	2133	2133	2133	2133	2133
Days per month		15	20	20	20	20	20	20	20	20	20	20	10
Total Excavations	479925	31995	42660	42660	42660	42660	42660	42660	42660	42660	42660	42660	21330

4 POLICY AND LEGISLATIVE CONTEXT

4.1 Table of Applicable Legislation and Guidelines

Table 6: Applicable Legislation and Guidelines

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT?
Constitution of South Africa, specifically everyone has a right; a. to an environment that is not harmful to their health or wellbeing; and b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: i. prevents pollution and ecological degradation; ii. promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	Mining Right activities	The mining right activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot altogether be avoided, minimised and mitigated to protect the environmental right of South Africans.
Minerals and Petroleum Resources Development Act (No 28 of 2002) [MPRDA] Section 24 (as amended) **MPRDA Regulations as amended by GNR 420 of 27 March 2020.** − The revised MPRDA Regulations requires meaningful consultation on the contents of the Social and Labour Plan to ensure that it addresses the relevant needs and is aligned to the updated Municipal Integrated Development Plans. − The consultation with landowners, lawful occupiers and interested and affected persons is required in terms of the public participation process prescribed in the EIA Regulations.	Application to the DMR for a mining right in terms of Section 22.	The conditions and requirements attached to the granting of the Mining Right will apply to the mining activities. DMR is the Competent Authority (CA) for this NEMA and NEM: WA application. The Social and Labour Plan is attached as **Appendix H**, page 354.
National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]	Application to the DMR for Environmental Authorisation in terms of the 2014 EIA Regulations as amended by the 2017 EIA Regulations. Refer to Table 4 for a list of activities.	An Application for Environmental Authorisation must be submitted to DMR for an Environmental Authorisation (EA). The listed activities in **Table 7** that are triggered determine the Environmental Authorisation (EA) application process to be followed, which is an EIA for this Mining Right. The appropriate EA must be obtained before proceeding with any mining activities in terms of the mining right application. The compilation of this Scoping Report and the Public Participation Process is required in terms of NEMA.

National Environmental Management Act, 1998 (Act No. 107 of 1998): Financial Provisions Regulations in GNR 1147 (dated 20/11/2015), as amended by GNR 495 (dated 11/06/2021)	The Final Rehabilitation, Decommissioning and Mine Closure Plan will be included in the DEIAR	The purpose of these Regulations is to regulate the determination and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation, and remediation of environmental impacts from prospecting, exploration, mining, or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. The **Final Rehabilitation, Decommissioning and Mine Closure Plan** is included in the DEIAR on **page 293**.
"Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" ("the Protocols"), in GG 43110 (dated 20 March 2020 came into effect on 15 May 2020), and GN 320. Themes included in this GN are agriculture; avifauna; terrestrial biodiversity; aquatic biodiversity; noise; defence; and civil aviation. **Protocols in GG 43855 of GN No. 1150 dated 30 October 2020 provide for Terrestrial and Animal Plant Species.**	Screening Tool Report and Site Sensitivity Verification Report is attached at **Appendix C, page 136**.	Refer to Section 8.1.10. **Appendix C: Screening Tool Reports and Site Verification Report, page 136.** Section 10.3 details the specialist compliance statements required to inform the EIA Phase, as per the requirements of the Protocols.
National Environmental Management: Waste Act, (Act 59 of 2008) [NEMWA] (as amended) **Waste listed activities in** **GNR 921 (dated 29/11/ 2013)** **Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration, or production operation in GNR 632 of 24 July 2015, as amended by GNR 990 of 21 September 2018.** **GNR 633 (dated 24/07/2015):** **Category B: Residue stockpiles or residue deposits**	Refer to **Table 7** for the listed waste activities.	The listed activities that are triggered determine the Environmental Authorisation (EA) application process to be followed. The Application for Environmental Authorisation has included the waste listed activities as shown in **Table 7** below. A generic description of the characteristics of the tailings is provided in Section 3.3.2. The slurry is to be pumped to a dewatering cyclone and dry slimes discharged to the mine Fine Residue Disposal site within the excavation. This material is dumped into the relevant open excavations as part of the ongoing rehabilitation process. Waste rock and sand is to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product. Generic mitigation measures are included in **Table 13** and the **EMPr**, **page 96**.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) [NEMBA] **National list of ecosystems that are threatened and in need of protection, 2011 (in GN 1002 dated 2 December 2011)**	Section 8.1.6 and 8.1.9 **Figure 23**	There are no listed Critically Endangered, Endangered or Vulnerable ecosystems on site. The Mining Right area is located in a CBA1 and CBA2 as shown in **Figure 23**.

National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) [NEMBA] **Alien and Invasive Species List, 2016 (in GN No. 864 dated 29 July 2016)**	Section 8.1.6 and 8.1.9	Alien invasive vegetation management is included in the **EMPr, page 96**.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004). National Dust Control Regulations in GN R827 of 1 November 2013	Section 8.1.11	Dust control measures are included in the **EMPr, page 96**.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Section 8.1.13	A Heritage Impact Assessment and a Palaeontological Report were prepared for inclusion in the EIA Phase. Refer to **Appendix E, page 176** These will be submitted to SAHRA for comment
National Water Act, 36 (Act 36 of 1998) and relevant Regulations if applicable: • **GN 704 of 1999 – Regulations on the location of mining activities in relation to water resources aimed at the protection of water resources. Section 10 refers to winning alluvial minerals from a watercourse and provides regulations that must be adhered to.** • **GN 509 of 2016 – General Authorisation in terms of section 39 of the NWA for water uses as defined in section 21(c) and (i) (if applicable)** • **GN 267 of 2017 – Regulations regarding the procedural requirements for water use licence applications and appeals.**	Section 8.1.8 for a description of surface water resources, and depth and quality of groundwater in the mining right area. **Figure 20**: Surface water features **Figure 21**: Groundwater depth **Figure 22**: Groundwater quality	Groundwater is abstracted from two existing boreholes and piped to the processing area. Kasimira Trading 82 (Pty) Ltd has a Water Use License: Reference 25176121) in terms of Section 21(a) of the National Water Act (NWA) for the abstraction of groundwater for a total of 35 000m³ per year, and for the disposal of waste in a manner which may detrimentally impact on a water resource in terms of Section 21(g) of the NWA, obtained from the Department of Human Settlements, Water and Sanitation (DHSWS) dated 02/09/2019. Refer to **Appendix D, page 161**. Target Area 3 and Target Area 5 will be located within 32m of a watercourse and some of the historic tailings to be processed or sold as by-products are within a watercourse. Therefore, a water use license in terms of Section 21 (c) for impeding or diverting the flow of water in a watercourse and 21 (i) altering the bed, banks, course or characteristics of a watercourse has been applied for, and a General authorisation issued (a copy of which is attached at **Appendix D, page 161**).
Hazardous Substances Act (Act No. 15 of 1973)	Storage and control of hazardous substances to be included in **EMPr**.	The objective of the Act is to provide for the control of substances that may cause injury or ill health to or death of human beings due to their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure. In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.

		The reagent chemicals to be used in the mineral processing plant, as well as chemicals typically found in petroleum products (for example) benzene, are regulated in terms of this Act. The processing plant, chemical storage area, fuel storage facility and refuelling bay, with all appropriate controls in place, will not conflict with the Act. The **EMPr**, on **page 96** will provide details in this regard.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996) (MHSA)	Safety precautions to be taken into account by the Project Team in the design of Mine.	The objective of the Act is to cover all aspects relating to the health and safety of employees and other persons on the mine property. The Act places the responsibility on the mine owner for ensuring that the mine is designed, constructed and equipped in a manner that allows for a safe and healthy working environment.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) [PAJA]	The decision by the Competent Authority	Gives effect to section 33 of the Constitution that requires that "Everyone has the right to administrative action that is lawful, reasonable and procedurally fair". All administrative actions must be based on the relevant considerations
Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA)	Comments required from the relevant Local Municipality.	Consent use in terms of the Municipal Planning By-Law, 2015 is required to permit mining on properties that are zoned for Agricultural purposes.
Protection of Personal Information Act, 2013 (Act No. 14 of 2013) (POPIA)	Section **6**, **APPENDIX B: PUBLIC PARTICIPATION REPORT**, page 127	The guidance document provided by the Department of Forestry, Fisheries and the Environment was used to determine the information to be included or excluded from the public domain to protect private or personal information.
Municipal Plans and Policies		
Nama Khoi Local Municipality Integrated Development Plan (Draft IDP 2018-2019)	Section 5.3	The Need & Desirability of the project is referenced in terms of the Nama Khoi Local Municipality IDP, specifically relating to enhancing the mining potential of the local municipality, employment creation, rehabilitation of mining areas, and adaption to climate change and sustainable resource utilisation. Relevant mitigation measures are included in the **EMPr, page 96.**
Namakwa District Municipality (Draft IDP 2017 2018)	Section 5.4	The Need & Desirability of the project is referenced in terms of the District Municipality IDP, specifically relating to employment creation, and ensuring the implementation of environmentally sustainable practices, along with an integrated approach to addressing climate change response, which is included in the **EMPr, page 96.**
Northern Cape Provincial Spatial Development Framework (NCPSDF)	Section 5.5	Sustainable development is a key consideration as addressed in this impact assessment report.

Northern Cape Provincial Growth and Development Strategy 2004-2014 (NCPGDS)	Section 5.6	Sustainable development is a key consideration as addressed in this impact assessment report.
Standards, Guidelines and Spatial Tools		
Mining and Biodiversity Guideline: 2013 Mainstreaming biodiversity into the mining sector. Pretoria.	Section 5.1 & 8.1.9 & **Figure 25**	The mitigation measures to address and mitigate the potential impacts of the mining are included in the **EMPr, page 96.**
DEA Guideline on Need & Desirability (2017)	Section 5.7	Refer to Section 5.7
DEA Guideline on PPP DMR Guideline on Consultation with Communities and I&APs (undated)	Section 7, **Table 8** & Appendix B, page 127.	Refer to Section 7 & **Table 8** and **Appendix B, page 127.**
DEAT Integrated Environmental Management Information Series 5: Impact Significance (2002)	Section 9	Refer to section 9, 11 and 24.
DEAT Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Section 9	Refer to section 9, 11 and 24.
SANBI BGIS databases (www.bgis.sanbi.org)	Baseline environmental descriptions in Section 8.1 and **Figure 16**, **Figure 19** and **Figure 23**.	Used during desktop research to identify sensitive environments within the mining right area.
CBA database for Northern Cape	Section 8.1.9 **Figure 23**	Used during desktop research to identify sensitive environments within the mining right area.
SKEP database highlighting fauna within mining right area	Section 8.1.6 and **Figure 24.**	Used during desktop research to identify sensitive environments within the mining right area.
CapeFarmMapper Database. Western Cape Department of Agriculture.	Section 8.1.8 Groundwater database accessed. **Figure 21** and **Figure 22**.	Groundwater depth and quality are described concerning excavations and disposal of tailings in excavations.
SANS 1929:2005 Edition 1.1 – Ambient Air Quality Limits for Common Pollutants	Management and monitoring measures.	The standard for dust fallout. Dust mitigation measures are to be included in the **EMPr**, **page 96.**
Clarity On Applicability of The Protection of Personal Information Act, 2013 To Requirements of The Environmental Impact Assessment Regulations, 2014 Relating to Registers of Interested and Affected Parties and The Inclusion of Comments in Reports (circulated on 3 September 2021)	Section **6**	The guidance document provided by the Department of Forestry, Fisheries and the Environment was used to determine the information to be included or excluded from the public domain.

4.2 Listed Activities

Table 7: Listed and Specified Activities

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
The operation directly relates to the mining of a mineral resource (diamonds) and requires a mining right in terms of section 22 of the MPRDA. • Refer to **Figure 2**, **Figure 3**, and **Figure 5**. • A small Run of Mine (ROM) stockpile will be required. • Spoils will be backfilled into existing excavations, with no waste stockpiles required. • Tailings Management. • Accessing the site via existing tracks and access roads to the area. • The existing logistics, such as the administrative complex, workshop apron areas, and diesel generator room will be utilised. • Sewage will continue to be collected in septic tanks and fed to a sewage treatment plant, which is to be upgraded. • Water is sourced from boreholes and stored in an existing reservoir. Water reticulation pipelines are to be upgraded. • Refuse collection containers will be located within the office block complex, processing plant, workshop, and personnel amenities. • Electricity is provided from existing Eskom powerlines. • Historical buildings are to be removed, such as the old explosives building, as part of the annual rehabilitation activities.	2199.5742 Ha	X	**GNR 984 (dated 8/12/2014) LN2 Activity 17, as amended by GNR 517 (dated 11/06/2021), LN2 Activity 17:** Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the mining right.	**GNR 921 (dated 29/11/2013):** **Category B: Construction of facilities and associated structures and infrastructure** (10) The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). **GNR 633 (dated 24/07/2015):** **Category B: Residue stockpiles or residue deposits** (11) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

The rehabilitation, decommissioning and closure of the mining operation, which will only be required at final decommissioning and closure.	2199.5742 Ha	X	**GNR 984 (dated 8/12/2014) LN2 Activity 17, as amended by GNR 517 (dated 11/06/2021), LN2 Activity 17:** Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the mining right.	**GNR 921 (dated 29/11/ 2013) Category A: Decommissioning of facilities and associated structures and infrastructure** (14) The decommissioning of a facility for a waste management activity listed in Category A or B of this schedule.
The extent of the mining area comprised of Resource Target Areas 1 to 8, will require the clearance of an area of approximately 65 Ha of indigenous vegetation, which is about 40% of the surface area of these target areas, due to the existing disturbance from bulk sampling and historical mining.	Approx. 65 ha	X	**GNR 984 (dated 8/12/2014) LN2 Activity 17, as amended by GNR 517 (dated 11/06/2021), LN2 Activity 17:** Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the mining right.	No
OTHER ACTIVITIES (Associated infrastructure and activities not considered to be listed activities)				
Excavations (not the development of infrastructure) in the area are demarcated as Resource Target 3, located within 32m of a non-perennial watercourse (Buffels River).		Not listed	Approx. 0.5 Ha of Resource Target 3 lies within 32m of the watercourse.	
Storage of fuel for the generators (to be in a bunded area) will have a total volume of hazardous goods stored on site of 12m³, less than the threshold of 80m³.	< 80m³	Not listed	Making use of surface fuel tanks with service apron, but it will be less than 80m³.	

5 NEED & DESIRABILITY OF THE PROPOSED ACTIVITIES

5.1 Mining and Biodiversity Guidelines (2013)

The Mining and Biodiversity Guidelines (2013)[2] state that: "Sustainable development is enshrined in South Africa's Constitution and laws. The need to sustain biodiversity is directly or indirectly referred to in a number of Acts, not least the National Environmental Management: Biodiversity Act (No. 10 of 2004) (hereafter referred to as the Biodiversity Act) and is fundamental to the notion of sustainable development. International guidelines and commitments, as well as national policies and strategies, are important in creating a shared vision for sustainable development in South Africa".

The Department of Mineral Resources (DMR), as custodian of South Africa's mineral resources, is tasked with enabling the sustainable development of these resources. This includes giving effect to the constitutional requirement to "prevent pollution and ecological degradation; promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development"[3].

The primary environmental objective of the MPRDA is to give effect to the "environmental right"[4] contained in the South African Constitution. The MPRDA further requires the Minister to ensure the sustainable development of South Africa's mineral resources, within the framework of national environmental policies, norms, and standards, while promoting economic and social development.

The Mining and Biodiversity Guidelines (2013) document identifies four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining. The categories are: Category A: Biodiversity priority area which is legally protected, and mining is prohibited; Category B: Highest Biodiversity importance – highest risk for mining; Category C: High Biodiversity Importance – high risk to mining; and "Category D: Moderate Biodiversity Importance" – moderate risk for mining. Category B and Category C require an environmental impact assessment process to address the issues of sustainability.

Refer to **Figure 25**, page 63, which shows the mining right area in relation to the Mining and Biodiversity Guidelines database (SANBI BGIS). Target Areas 2 to 5 are located in Category B, with Target Areas 1, 7 and 8 in Category B and C, and Targets Areas 6 and 7 located in Category C.

The latest conservation mapping for the Northern Cape is mapped in **Figure 23**, page 61 indicating a slight difference between the boundaries of the CBA1, CBA2 and the ESA (Ecological Support Area) when compared to the Categories of the Mining and Biodiversity guidelines.

5.2 Diamond Resources Supply and Employment Benefits

The full labour force will total 23 employees of 4 will be unskilled, 12 will be semi-skilled, and 4 will be skilled and the remaining 3 various levels of management.

Services that will be outsourced and that will provide job security will be environmental monitoring services and compliance officer, training, mining engineer, surveyor, consultant geologist, and main workshop.

5.3 Nama Khoi Local Municipality IDP (Draft IDP 2018/2019)

In the Constitution of South Africa (108 of 1996) the objectives of a municipality or local government structure are described as follows under "section 152. (1) The objects of local government are-

(a) to provide democratic and accountable government for local communities;
(b) to ensure the provision of services to communities in a sustainable manner;

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

[3] Constitution of the Republic of South Africa (No. 108 of 1996).

[4] Section 24 of the Constitution states that "everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

(c) to promote social and economic development;
(d) to promote a safe and healthy environment; and
(e) to encourage the involvement of communities and community organisations in the matters of local government".

The vision of the Nama Khoi Municipality is:

"To proudly deliver sustainable local economic development and climate resilient quality services to the Nama Khoi Municipality"

The development and implementation of the Nama Khoi Local Economic Development (LED) strategy aim at ensuring the alignment to the economic sectors and also assist the SMME's in co-operation with other stakeholders:

- To initiate, lead and sustain an environment for job creation in the Nama Khoi Municipal Area.
- To leverage municipal assets and the municipal procurement process with the view to stimulate redistribution and growth.

The Macro Strategic Development concept provides a broad spatial development framework for the total municipal area and contains spatial planning proposals based on the following concepts (only those of relevance referenced here):

SPATIAL OBJECTIVE 3: To develop sustainable and diverse local economies by the utilisation of opportunities in the different spatial categories.

MINING

- There is a concentration of minerals around the Springbok area, as well as in a broad band along the south of the Orange River.
- Although many of these sources have been depleted, there are still plenty of occurrences that can be exploited, and this should be considered for small scale mining.
- The Industrial mining corridor as indicated in the PSDF must be investigated for opportunities and exploited where possible.
- To solve the disputes and issues related to mining rights and to investigate the possibility for local communities to gain access and limited mining rights in areas to be identified for this.

SPATIAL OBJECTIVE 4: To protect the pristine and unique natural environment with its four distinct bio-geographical regions by means of effective management and managed use.

CORE & BUFFER AREAS

- To protect and manage the following environmentally important areas in line with the objectives and targets of the NBSAP:
  - The western part of the local municipality from the coast to the east of the N7, which has been identified as a SANBI priority area; and
  - The western mountain ranges including the Kamiesberg and the Hantam which has been identified as a SANBI Escarpment.
- To protect the natural spaces affected by the Terrestrial and Aquatic Critical Biodiversity areas against development and overgrazing, due to its vital role in maintaining biodiversity.
- To support the Critical Biodiversity Corridor Linkages towards the surrounding municipalities.
- To expand the three statutory protected conservation areas in the municipal area, i.e., Goegap Provincial Nature Reserve, Namaqua National Park and Nature Reserve.
- To rehabilitate all mining areas and damaged areas in the region and to remove and terminate unwanted activities and undesirable structures in and around protected areas.
- To investigate and eradicate the invasive Prosopis tree which poses a significant threat to biodiversity and ecosystem services in the Northern Cape Province of South Africa.

OTHER

- To ensure that future planning in the region considers the mitigation of climate change, including the curbing of greenhouse emissions associated with transport and electricity use. A Climate-Neutral Strategy is to be developed for the Northern Cape. The implementation of this strategy into land use management regulations would be mandatory on all municipalities and the private sector.
- To improve the urban areas' natural character through landscaping, tree planting, the development of natural parks and the protection of natural areas and (flowers) in the neighbourhoods.
- To rehabilitate the old mining areas to improve the environmental character of the area.
- To develop additional environmental awareness campaigns and environmental education programmes for the communities and visitors.

5.4 Namakwa District Municipality Draft IDP 2017 2018

The vision of the Namaqua District Municipality IDP is: "*Namakwa District Municipality, a centre of excellence!*"

The Mission Statement is:

- A government institution legislatively mandated to stimulate economic and social transformation within the jurisdiction of the Namakwa District Municipality;
- By fostering partnership with relevant institutions to ensure sustainable development;
- Proactively supporting and capacitating B-municipalities;
- Be a transparent and accountable centre of excellence; and,
- Provide local leadership on environmental sustainability and climate change response.

The Strategic Objectives are

- Ensuring the delivery of basic services which include water, sanitation, electricity, and waste management.
- Creation of a thousand job opportunities through the community public works programme, as part of 4, 5 million EPWP jobs.
- Transformation of administrative and financial systems of NDM and relevant B-Municipalities, which includes supply chain management.
- Ensure the filling of six critical posts (Municipal Manager, Chief Financial Officer (CFO), Town Planner, Town Engineer, Human Resource Manager, and Communication Manager) in all municipalities in the district.
- Clean audits for all Municipalities.
- Building municipal capacity to enable municipalities to collect their revenue.
- Ensure sustainable economic and social transformation in the district.
- A society with a renewed sense of identity and confidence in its skills and knowledge.
- Bridging the digital divide.
- Ensure the implementation of environmentally sustainable practices, along with an integrated approach to addressing climate change response, across all sectors.

The Namakwa District Municipality adheres to the values contained in the Batho Pele Principles.

The effects of climate change, such as flood events, on the proposed mining project will be mitigated as per the measures to be contained in the **EMPr**. The mitigation for emissions of greenhouse gases from vehicles and machinery associated with the mining activities will be addressed in the **EMPr** and Closure and Rehabilitation Plan.

5.5 Northern Cape Provincial Spatial Development Framework (NCPSDF)

The NCPSDF states that: "*Cape is not one of South Africa's richest provinces in monetary terms. Accordingly, there is a need for coherent prioritisation of projects within a spatial economic framework that takes due cognisance of environmental realities and the imperative to create a developmental state*". The NCPSDF was designed as an integrated planning and management tool for all spheres of government to facilitate ongoing sustainable development throughout the province.

The NCPSDF, together with the Provincial Growth and Development Strategy (PGDS), is set to fulfil an important role as a spatial and strategic guideline that addresses the key challenges of poverty, inequality and environmental degradation through the innovative use of the resources (capital) of the province for the benefit of all concerned."

The potential for job security, employment and skills transfer are identified as positive environmental impacts in this report. The potential negative environmental impacts can be mitigated through the implementation of the **EMPr** and the Closure and Rehabilitation Plan, to ensure a sustainable mining activity.

5.6 Northern Cape Provincial Growth and Development Strategy 2004 – 2014 (NCPGDS)

The NCPGDS has the following vision for the province: "Building a prosperous, sustainable growing provincial economy to reduce poverty and improve social development." The strategy for the growth and development of the province is guided by the following key principles:

- Equality – notwithstanding the need to advance persons previously disadvantaged, development planning should ensure that all persons should be treated equally;
- Efficiency –the promotion of the optimal utilisation of existing physical, human, and financial resources;
- Integration – the integration of spatially coherent regional and local economic development and improved service delivery systems.
- Good Governance – the promotion of democratic, participatory, cooperative, and accountable systems of governance and the efficient and effective administration of development institutions;
- Sustainability – the promotion of economic and social development through the sustainable management and utilisation of natural resources and the maintenance of the productive value of the physical environment;
- Batho Pele – the placement of people and their needs at the forefront of its concern and serve their physical, psychological, developmental, economic, social, and cultural interests equitably.

5.7 DEA Guideline on Need and Desirability (2017)

As referenced in the DEA Guideline on Need and Desirability (2017), NEMA defines "*evaluation*" as "*the process of ascertaining the relative importance or significance of information, in the light of people's values, preferences and judgements, in order to make a decision.*" In evaluating each impact (negative and positive) in terms of each of the aspects of the environment, "*need and desirability*" must specifically be considered in the analysis of each impact of the proposed activity. However, to determine if the proposed activity is the best option when considering "*need and desirability*", it must also be informed by the sum of all the impacts considered holistically. In this regard "*need and desirability*" also becomes the impact summary with regard to the proposed activity. The impact summary is included in the EIR, page 84.

These Guidelines state that: "*In considering the impact summary it must be remembered that ultimately the aim of EIA is to identify, predict and evaluate the actual and potential risks for and impacts on the geographical, physical, biological, social, economic and cultural aspects of the environment, in order to find the alternatives and options that best avoid negative impacts altogether, or where negative impacts cannot be avoided, to minimise and manage negative impacts to acceptable levels, while optimising positive impacts, to ensure that ecological sustainable development and justifiable social and economic development outcomes are achieved*".

The **principles of Integrated Environmental Management (EIM)** as set out in Section 23 of NEMA have been considered in the scoping environmental assessment and will be applied in this EIR, **EMPr**, page 101 and **Closure Report**, page 293, as explained below.

- **Environmental management placing people and their needs at forefront of its concern, and serve their physical, physiological, developmental, cultural and social interests equitably** – This process will be undertaken transparently, and all effort will be made to involve all the relevant stakeholders and Interested and Affected Parties. I.e., Public participation will be undertaken to obtain the issues/concerns/comments of the affected people for input into the process.
- **Socially, environmentally, and economically sustainable development** – All aspects of the receiving environment and how this will be impacted has been considered and investigated to ensure a minimum

detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures were proposed to ensure that the impact is mitigated. I.e., this report along with the **EMPr** (page 96) proposes mitigation measures that will minimise the negative impacts of the proposal on the environment.

- **Consideration for ecosystem disturbance and loss of biodiversity** – the mining site is located in a CBA, near the Buffels River in an area historically mined and heavily disturbed. Ecosystem disturbance and loss of biodiversity are considered in the impact assessment. Rehabilitation back to the natural state is a key component and will be undertaken in a phased manner as the mining activities progress. This report together with the **EMPr (page 96)** and **Final Rehabilitation, Decommissioning and Mine Closure Plan (page 293)** proposes mitigation measures that will minimise the impacts of the proposal on the environment.
- **Pollution and environmental degradation** – The implementation of recommendations made and proposed mitigations to be detailed in the EIR and **Environmental Management Programme Report (EMPr, page 96)** and **Final Rehabilitation, Decommissioning and Mine Closure Plan (page 293)** will ensure minimum environmental degradation. Erosion and dust have been identified and detailed mitigation measures are included in the **EMPr** in the EIA phase to minimise the impacts.
- **Landscape disturbance** – All aspects of the receiving environment and how this will be impacted have been considered and investigated at a scoping level to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures are detailed in the EIR, **EMPr** and **Final Rehabilitation, Decommissioning and Mine Closure Plan** to ensure that the impact is mitigated.
- **Waste avoidance, minimisation, and recycling** – These aspects were considered and incorporated into the operational component of the project, and mitigation measures were included in the **EMPr (page 96)** and **Final Rehabilitation, Decommissioning and Mine Closure Plan (page 293).**
- **Responsible and equitable use of non-renewable resources** – These aspects have been considered and there is not much scope to reduce the use of non-renewable resources, such as vehicle transport or the use of diesel in the genset.
- **Avoidance, minimisation and remedying of environmental impacts** - All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures will be proposed to ensure that the impact is mitigated. A number of mitigation measures are detailed to minimise the impact of the proposal on the environment.
- **Interests, needs and values of Interested and Affected Parties** – This process has been undertaken transparently and all effort has been made to involve all the relevant stakeholders and Interested and Affected Parties (I&APs). The dSR was made available to all identified I&APs to obtain comments on the proposed development. No comments were received. The dEIAR are also be made available to all I&APS for a 30-day commenting period.
- **Access of information** – Potential Interested and Affected Parties were notified of the proposal and the availability of the Draft Scoping Report (DSR) and Draft Environmental Impact Assessment Report (dEIAR). They were also notified of having the opportunity to register as an I&AP. Organs of state will be kept informed during the EIA process.
- **Promotion of community well-being and empowerment** – This process is being undertaken transparently and all effort is being made to involve all the relevant stakeholders and I&APs.
- **Potential impacts on the biophysical environment and socio-economic conditions** have been assessed, and steps have been taken to mitigate negative impacts and enhance positive impacts. Any mitigation measures from SAHRA will be included in the FEIR. Adequate and appropriate opportunities will be provided for public participation. Environmental attributes have been considered based on the available information, and environmental management practices have been identified and established to ensure that the proposed activities will proceed in accordance with the principles of IEM.

6 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PREFERRED SITE, ACTIVITY & ALTERNATIVE

6.1 The process to reach the Proposed Preferred Alternative

With reference to the Mine Site Plan provided as **Figure 5** and the location of the individual activities on-site, details are provided of the alternatives considered with respect to the:

(a) Property on which or location where it is proposed to undertake the activity;
(b) Type of activity to be undertaken;
(c) Design or layout of the activity;
(d) Technology to be used in the activity;
(e) Operational aspects of the activity; and
(f) Option of not implementing the activity.

Appendix 2 Section 2 (h)(i) of the EIA Regulations, 2014, requires that all S&EIR processes must identify and describe feasible and reasonable alternatives. Alternatives considered during the screening phases of the project are described below.

6.2 Location or Site Alternatives

6.2.1 Infrastructure and bulk services

- The location of a mining right is determined by the shape, position and orientation of the mineral resource shown as Target Areas in **Figure 5**.
- The mining target areas have been identified based on the geological formations of the area as shown in **Figure 4** and previous prospecting and bulk sampling activities.
- The existing infrastructure logistics, such as laydown areas, offices, processing plants, water infrastructure, access control and security area, were constructed during the prospecting and bulk sampling process as shown in **Figure 6 to Figure 12**.
- The mobile processing plants are located are shown in **Figure 7**.
- Electricity for the processing plant is provided by Eskom and the water pumps are run with diesel generators, therefore no electrical powerlines are required.
- There are existing access roads and tracks throughout the mining right area, providing good access for haul trucks. Where existing tracks will need to be upgraded or new roads created these will be constructed in accordance with the **EMPr (page 96),** developed in the EIA Phase to mitigate any impacts.
- The mining right area is adjacent to the R355 access road to Kleinzee (40km to the west) and Springbok (60km to the east) ensuring convenient access to everyday services and accommodation.
- Water supply is from the two existing boreholes on site. Groundwater abstraction has been approved in terms of the Water Use License (Refer to **Appendix D page 161**).
- The location for the tailings disposal will be the excavations as described in the mineral processing in Section 3.3.2 above. Tailings from the pan (overflow) discharges continually onto an individual dewatering screen, coarse residue (CR) discharges onto the 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 discharge 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 ongoing rehabilitation process.

6.3 Type of Activity

The Applicant is not the landowner, and therefore it would not be realistic for this company to propose another type of activity as their core business is mining. Although the proposed mining activity takes place over a long time period, the best post-mining land use alternative is to return the site to its natural state. The holder of a mining right is required to rehabilitate the environment affected by mining to its natural state or to another predetermined land use. Other activity alternatives have therefore not been considered as the purpose of the proposed project is to prospect for diamonds within the Mining Right application area as shown in **Figure 2**.

The only other activity required to be assessed in terms of NEMA is the "do-nothing" or "no-go" alternative, as detailed further in section 6.7 below.

6.4 Design or Layout of Activity

The design or layout of a mining project is determined by the shape, position and orientation of the mineral resource as described in Section 6.2 above. Target Areas for mining have been identified as shown in **Figure 5**, and the location of the existing infrastructure and logistics are shown in **Figure 3** and in **Figure 6 to Figure 12.**

6.5 Technology Alternatives

The technology used in a mining project is determined by the type, shape, position, and orientation of the mineral resource. The technology to be applied is applicable to the mining approach and programme.

All In-Situ resources will be mined through current mining methods, but the bulk of the ex-situ diamond potential at Wolfberg lies locked up in calcified gravels and will require crushing and of the consolidated (mainly calcified but also slightly silicified) material in order to liberate the diamonds.

There are various combinations of the basic tools for liberating diamonds from calcified gravel matrix which can be chosen from that include combinations of jaw crushers, cone crushers, and a ball mill, with screens and conveyor systems as described in Section 3.3.2 above.

- The reduction ratio of the jaw crushers is generally 1:10, which means that the primary crusher can theoretically reduce the material fed into it from 250mm to 25mm diameter. The secondary jaw crusher can then reduce it further down to a minimum size of 10mm diameter, after screening off the -10mm fraction between the two crushers.
  - The reason why 10mm is chosen as the minimum crushing output particle size, is so that diamonds up to this size are not fragmented by the crushing process. This size is chosen as an optimum since larger diamonds are extremely rare in the Buffels River diamond size populations.
  - Crushing to a smaller size is not necessary to liberate smaller stones, because the fragmentation of the matrix rock (in this case mainly calcrete) tends to occur along the boundaries between the diamonds and the matrix rock, due to the stark differences in physical properties and lack of surface adhesion between the two substances.
- The necessary grizzlies, feed bins, conveyor systems and screens will need to be custom-built for this fragmentation phase of the upgraded processing plant.

There are no other technology alternatives for consideration.

6.6 Operational alternatives

Mining is to take place as a continuation of current bulk sampling surface mining and entails:

- Removal of overburden above the diamond-bearing gravels by an excavator to expose the diamondiferous gravels which overlie the bedrock;
- Removal of the diamondiferous gravels which will be sent to the plant for processing and diamond recovery;
- Waste rock and sand to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product; and.
- Sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing.
- Indicated resources will be mined together with the proven reserves and the inferred resources will be investigated as a last option for mining.

<u>Mineral Processing</u>

Material from the 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. Spoils from hand sorting of diamonds to be sold as pebbles (Gemstones). Waste rock and sand to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product. 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 are discharged. 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 ongoing rehabilitation process. Waste rock and sand is to be backfilled or processed by crushing and screening to be sold as industrial minerals as a by-product.

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

The concentrate from the pan is collected in a concentrate bin and moved to the final recovery area where the final concentration takes place using pleitz jigs before it is moved to the sorting tables for final sorting by hand. Spoils are to be sold as pebbles (gemstones except for diamonds).

There are therefore no other operational alternatives for consideration.

6.7 The No-go Alternative

The No-Go Alternative will mean that the potential for increasing the supply of diamonds will not be realised. There will be no supply of diamonds in the local and international market, and no generation of much needed employment opportunities. The Nama Khoi local municipality has a high unemployment rate, with the decline in mining a decade ago. The ongoing flow of revenue and employment security will continue to have a very positive spin-off locally and regionally.

6.8 Summary of Alternatives

The assessment of alternatives must at all times include the "no-go" option as a baseline against which all other alternatives must be measured. The "no go" alternative will therefore be further assessed together with the preferred and only alternative in the impact rating component of the EIA Phase.

The project site has been selected based on the results from prospecting and bulk sampling. The layout and technology of the mining and the associated existing infrastructure comprising the logistics, infrastructure and processing plants have been determined by the shape, position, and orientation of the mineral resource, and will continue to be applicable for the Mining Right Target Areas, as shown in **Figure 5**.

The existing infrastructure and access roads will be utilised. The operational approach is practical and based on best practices to ensure a phased mining approach.

In summary, therefore:

- **The Preferred Alternative is the Mining of Diamonds, as per the Mine Plan Target Areas shown in Figure 5.**
- The preferred and only **location** alternative of the mining activity is as per **Figure 5**, which indicates the Target Areas, and the location of the existing infrastructure and logistics as shown in **Figure 3**. The existing

access roads will be utilised, and sections upgraded or new routes developed as required. No electricity powerline connections are required.

- The preferred and only **activity** alternative is the mining of diamonds based on the mineral resources investigated during the previous prospecting and bulk sampling in the target area localities shown in **Figure 5**.
- The preferred **technology** alternative is the use of the crushing tools, grizzlies, feed bins, conveyor systems and screens to be custom-built for the fragmentation phase of the upgraded processing plant. Electricity is supplied by Eskom, with diesel generators for the borehole pumps, as described in Section 6.5 above.
- The preferred **operational** alternative involves the mining taking place as a continuation of the current bulk sampling surface mining and entails:
  - Removal of overburden above the diamond-bearing gravels by an excavator to expose the diamondiferous gravels which overlie the bedrock;
  - Removal of the diamondiferous gravels which will be sent to the plant for processing and diamond recovery; and,
  - Sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing.

  Indicated resources will be mined together with the proven reserves and the inferred resources will be investigated as a last option for mining.

The preferred alternatives described above will be rated in the impact assessment component in the EIA phase, together with the mandatory "no-go" alternative that must be assessed against as the environmental baseline, for comparison purposes in terms of significance through the life of the project. The public participation process initiated in the scoping phase and the EIA phase will serve to inform the selection of alternatives for detailed impact assessment in this EIA Phase.

7 PUBLIC PARTICIPATION PROCESS

7.1 Introduction

The public participation process has been conducted according to the requirements as prescribed in Regulations 40 to 44 of the EIA Regulations, 2014 (as amended). Full details of the public participation process conducted including copies of all supporting documents (e.g., the information provided to Interested & Affected Parties (I&APs) and the comments received) were included in **Appendix B** of the Final Scoping Report submitted to DMR. Any comments received as part of the dEIAR consultation will be included in **APPENDIX B: PUBLIC PARTICIPATION REPORT**, page 127.

The public participation process for the EIA Phase will also comply with the requirements of the Protection of Personal Information Act, 2013 (Act No. 14 of 2013) (POPIA) and the guidance document by the Department of Forestry, Fisheries and the Environment relating to registers of interested and affected parties and the inclusion of comments in reports.

The commencement of the EIA Phase is detailed in section 7.3 below.

7.2 Public Consultation on Draft Scoping Report

The Draft Scoping Report was made available on the previous consultant's, Green Direction Sustainability Consulting (Pty) Ltd, website, and the project notification letter with registration and comment form was emailed to relevant Government Departments, landowners and adjacent neighbours and other Interested and/or Affected Parties (I&APs).

The following public consultation process took place, proof of which was attached as **Appendix B** in the FSR:

- The commenting period of 30 days on the Draft Scoping Report was from 1 June 2021 to 1 July 2021
- Comments and requests to be registered were required to be submitted in writing.
- A Registration and Comment Form was included with the Project Notice.
- Although it was stated that a hard copy could be made available on request at the Kleinzee or Springbok library, no one requested a hard copy.
- A Dropbox link to download the reports was included with the email notification dated 30 May 2021.
- No Organs of State or Interested and/or Affected Parties provided comments or requested a meeting.
- All public consultation documents, such as a copy of the advertisement placed in the local newspaper (Die Plattelander); site notices placed on site; project notification; and proof of project notification, were included in Appendix B of the Final Scoping Report.

7.3 The comment period on DEIAR

Registered I&APs (organs of state) are notified of the commencement of the EIA Phase, via email notification and the notice letter of commencement of the EIA Phase. The letter will also contain the following consent note: "*By registering as an Interested and Affected Party, you give your consent to the processing of personal information, as contemplated in the Protection of Personal Information Act, 2013 (Act no. 4 of 2013) for the purposes of this particular project. You also agree that by submitting a comment in response to the application for environmental authorisation, your contact details may be reflected, where required by legislation, in all reports that must be compiled and submitted to the general public, registered stakeholders, as well as the organ(s) of state that is/ are charged with consideration and decision-making in respect of this application.*"

The comment period on the DEIAR is from **14 October 2021 to 15 November 2021.**

7.4 Summary of Issues Raised by I&APs

No comments were received on the Draft Scoping Report.

Table 8: Summary of Issues Raised by I&APs

Interested and Affected Parties **List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.**		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
AFFECTED PARTIES					
Landowner	**X**				
KASIMIRA TRADING 82 PTY LTD		None			
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	**X**				
Plaaslike Oorgangsraad-Komaggas		None			
West Coast Resources (Pty) Ltd		None			
Municipal Councillor	**X**				
Nama Khoi Ward Councillor		None			
Municipality	**X**				
Nama Khoi Local Municipality		None			
Namakwa District Municipality		None			
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA)	**X**				
Department of Roads and Public Works		None			
Communities					
N/A					
Dept. Land Affairs	X				
Department of Rural Development and Land Reform		None			
Traditional Leaders					
N/A					
Dept. Environmental Affairs & Nature Conservation	**X**				
Department of Environment and Nature Conservation (DENC)		None			
Other Competent Authorities affected	**X**				
Department of Human Settlements, Water and Sanitation (DHSW&S)		None			
SAHRA		None – comment is normally received on the DEIAR			
OTHER INTERESTED & AFFECTED PARTIES					

8 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PROJECT SITE

8.1 Type of Environment Affected by the Proposed Activity

8.1.1 Regional Setting

Namaqualand is a unique and diverse environment owing in large part to the presence of four distinct biogeographically regions within its boundaries. The Orange River valley lies to the north and is characterized by very dry desert conditions. In the west, the area is composed of coastal plains, which transition into granite hills that straddle the escarpment, before transforming into low lying Bushmanland plains to the East of Springbok.

Wolfberg lies in the Lower Buffels River Valley, which forms part of the vast coastal plain between the Namaqualand Metamorphic Mountainland and the West Coast of South Africa. The road from Springbok descends from the escarpment into the valley below via the Spektakel Pass.

8.1.2 Geology and Soils

Regional overview

Sediments of the Namaqualand coastal area overlie the Precambrian Metamorphic Basement Complex, which consists predominantly of granite-gneiss, sparsely interspersed with minor mafic intrusives, and often intersected by quartzite ridges, marble layers and a wide variety of schists (De Villiers & Söhnge, 1959). Refer to **Figure 13**.

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 the 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, can 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.

Site-specific geology

The present course of the Buffels River forms the Wolfberg (Farm Wolfberg 87) southern 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 Wolfberg, of which the northward apex extends across the southern part of Langhoogte.

During this period, the Buffels River palaeo-channel, therefore, entered Wolfberg from the south-east, turned westward across Langhoogte and exited Wolfberg in a south-westerly direction towards Nuttabooi. The channel apex on Langhoogte is the highest elevation the palaeo-Buffels River has reached in this part of the valley (refer to **Figure 14**).

From current operations, it is clear from that the palaeo-Buffels River exerted tremendous energy over a considerable period of time to transport and deposit immense boulder-beds on Wolfberg and Langhoogte. The boulders, cobbles, and pebbles on these two farms 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 the 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 Mountainland and entering the Buffels River Valley contributed diamondiferous gravel derived from older glacial deposits. Thus, gravel was likely contributed by the palaeo-Stry River (also called Stryd River), one of the main tributaries of the palaeo-Buffels River entering through Langhoogte from the north-east, following the overall trend of the basement gneiss regional foliation. The general trend of the regional foliation of the basement gneiss to a large extent controls the direction of mafic lineaments forming within it.

While the primary large-boulder beds occupied the larger and deeper bedrock depressions, more widespread primary cobble-pebble gravel terraces formed on the adjacent flat ground, mainly at elevations between 140 and 155 mamsl (metres above mean sea level). The bulk of these primary deposits are centred in the middle of the borderline between Wolfberg and Langhoogte and are closely associated with the most northward meander of the palaeo-Buffels River and were progressively laid down on the inside of the meander bend as it carved its way northwards until curbed by high ground.

The younger modern Buffels River later progressively deepened the valley and became confined to the central part of the valley during recent more arid climates. Numerous younger tributaries from the adjacent high ground then cut across the palaeo-Buffels River deposits on both Wolfberg and Langhoogte, leaving only the largest and most stable deposits in the deepest bedrock depressions. During this erosion phase, most of the higher-level primary cobble-pebble gravel terraces were scoured down to bedrock by the crisscrossing of younger floodwaters, and redeposited about two kilometres downstream, as can be seen near the cross between the R355 and the Nuttabooi-Langhoogte entrance roads at an elevation of approximately 110 mamsl.

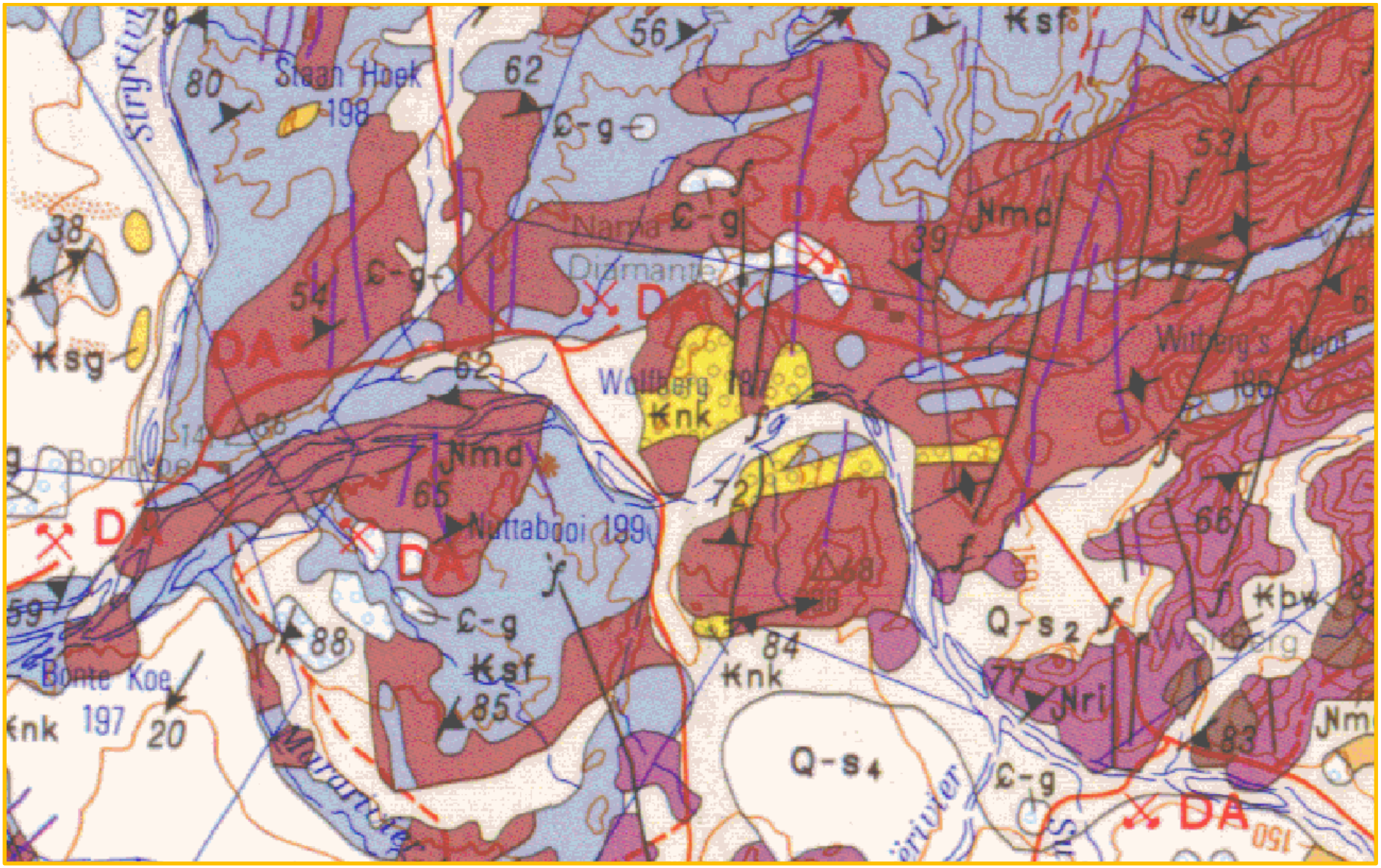


Figure 13: Geological Map (also included as Figure 4 above)

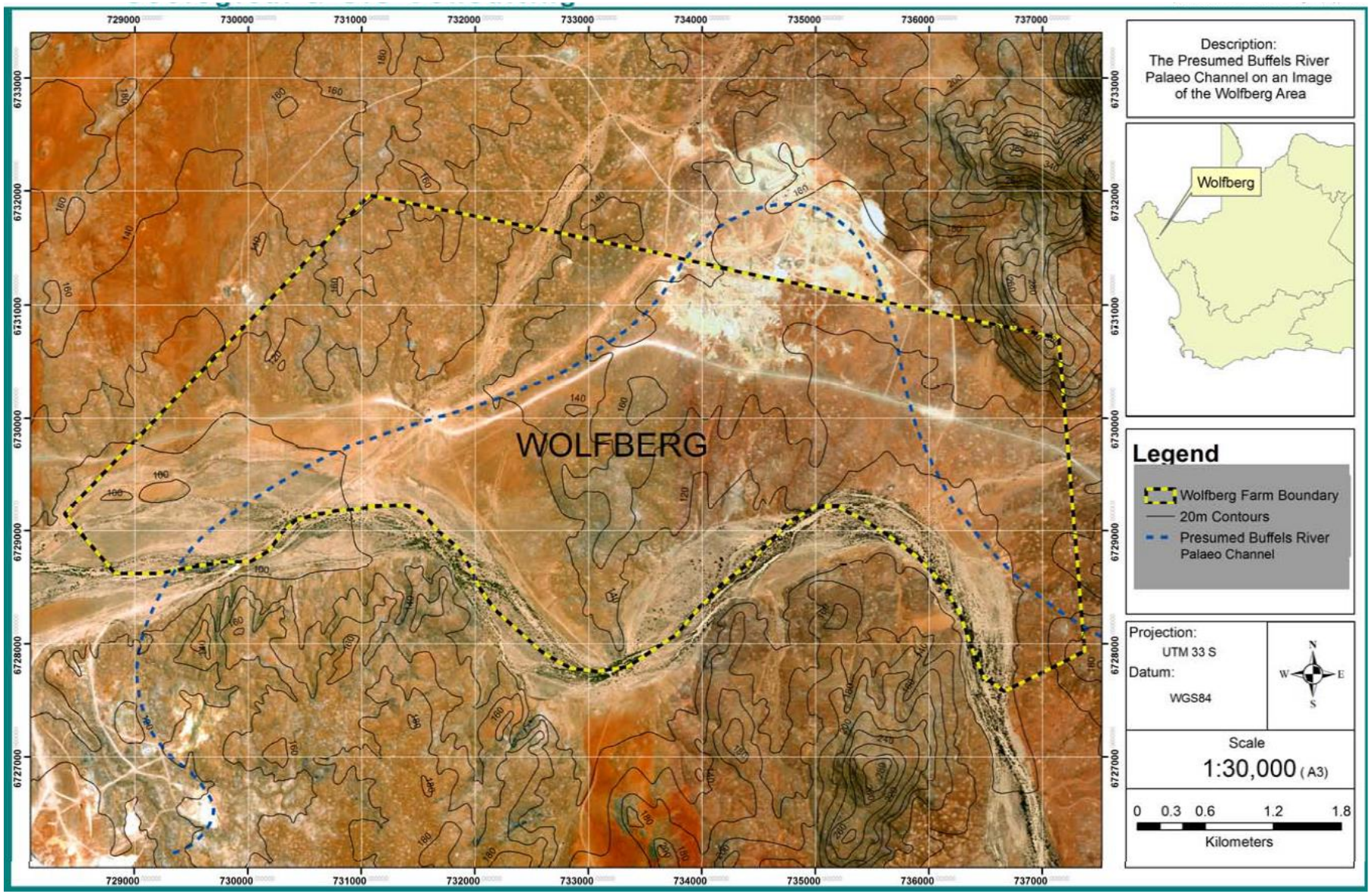


Figure 14 Wolfberg farm boundaries and the presumed course of the predominant Buffels River palaeo channel.

8.1.3 Landscape and Land Use

Refer to **Figure 16, page 50,** which shows the Mining Right Target Areas overlaid on the land-use SANBI BGIS Map Viewer Database dated 2009, exhibiting large areas of "mined bare areas" (red), "semi-bare areas" (pink), with patches of "bare non-vegetated" (white) areas, and shrubland" (purple). Further landscape descriptions provided by Mucina and Rutherford (2006) are included under the descriptions of the vegetation types in Section 8.1.6.

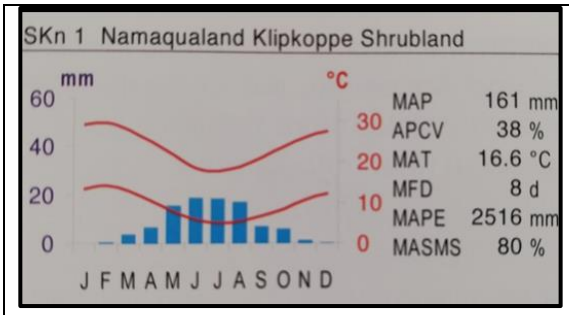
8.1.4 Slope

The area is relatively flat with "heuweltjie" formations creating relief in the arid landscape. Refer to 48 above, which includes the 20m contours.

8.1.5 Climate

The project site is located within the Succulent Karoo Biome (refer to **Figure 17** and **Figure 18**) where the climate experiences epizodic drought periods (well below 100mm per year) of one or two years in succession.

Refer to the climatic charts included in **Figure 15** below, for the average temperatures, rainfall, and wind speed. The Mean Annual Precipitation in the mining area is approximately 115mm, with the Mean Annual Potential Evaporation (MAPE) of 2611 mm, which means that the evaporation exceeds that of precipitation. The soil moisture stress (measured as the Mean Annual Soil Moisture Stress (MASMS) where the % of days where evaporative demand was more than double the soil moisture supply) is recorded as 81% for the predominant vegetation type found on site.



[The blue bars show the median monthly precipitation. The red lines show the mean daily maximum and minimum temperature.]

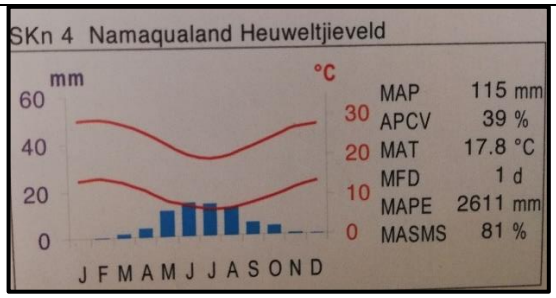


Figure 15: Climatic data for vegetation types found within the Mining Right boundary (Munica & Rutherford; 2006)

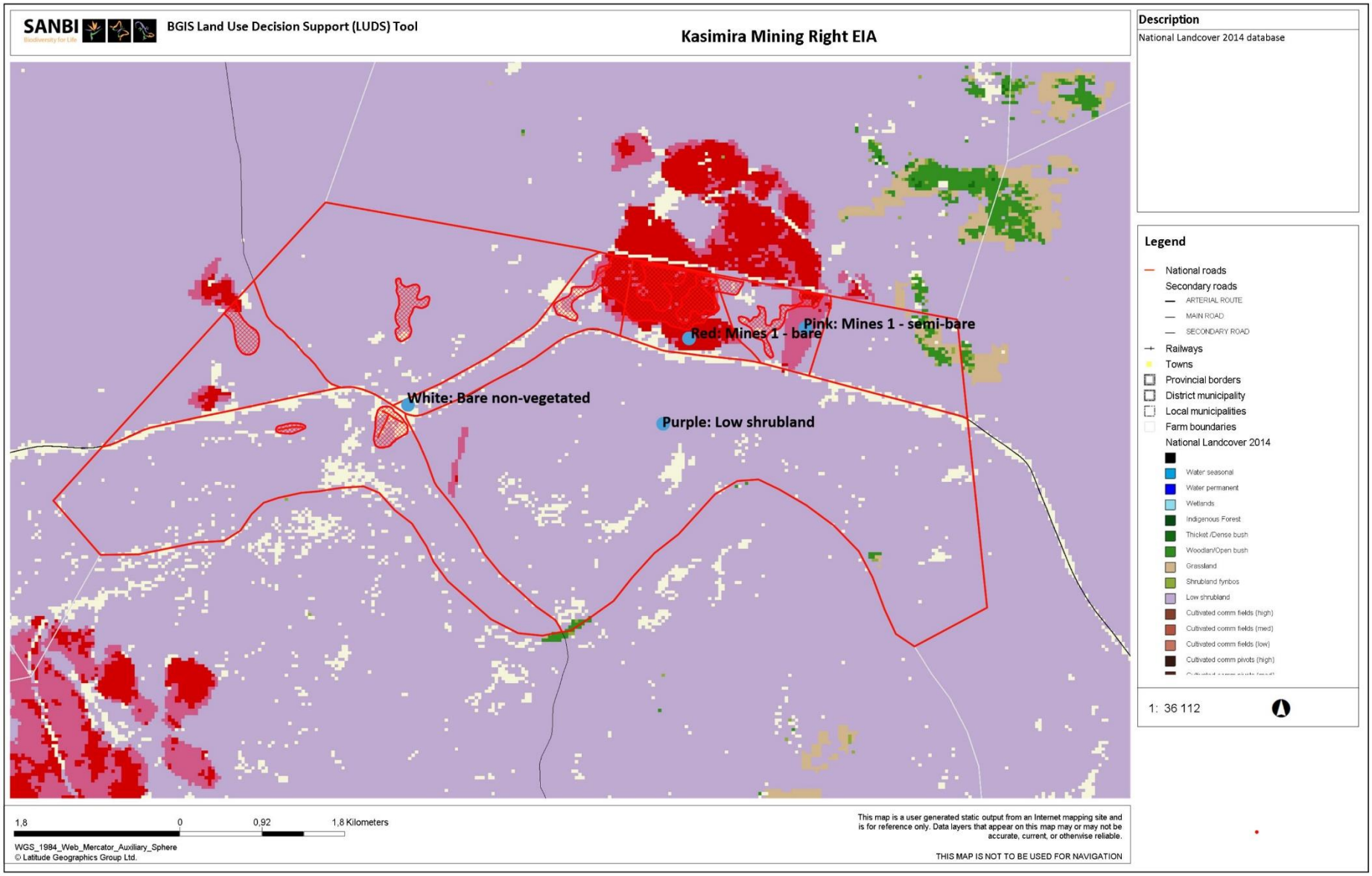


Figure 16: SANBI BGIS Land Use

8.1.6 Biomes and Vegetation

The Succulent Karoo Biome, including desert, covers about 7.5% of South Africa (approximately 83 000 km²). This biome covers the arid western parts of South Africa, including Namaqualand as shown in **Figure 17** and **Figure 18**. The region is extremely dry in summer and the temperature often rises above 40°C. Rain falls in winter and varies from 20 mm to 290 mm per year.

The Succulent Karoo has the largest number of succulent plants in the world for a region of its size. Most of these plants have succulent leaves, and many are very tiny, like the stone plants. Plants in the Succulent Karoo are adapted to survive extremely dry summers. Succulent plants like small vygies and crassulas and the large Quiver Tree store water in their leaves and/or stems. Some trees have white bark to reflect heat. Annual daisies and geophytes remain dormant in summer and grow and flower after the winter rains. Many parts of the Succulent Karoo are famous for their spring flowers. Flower tourism is an important source of income.

The Succulent Karoo Ecosystem Programme (SKEP) has been developed to conserve this region. Refer to **Figure 24, page 62**, which shows the SKEP database for the mining area. The Mining Right application area is located within the SKEP Greater Richtersveld area and includes the Gariep region, which has approximately 2700 plant species, 560 of which are endemic. Since 80% of the plant species are succulents, this is widely regarded as the area with the world's highest succulent diversity.

The vegetation types described below are illustrated in **Figure 19**, **page 54.**

Namaqualand Klipkoppe Shrubland (SKn 1)

As referenced from Mucina and Rutherford (2006), the Namaqualand Klipkoppe Shrubland (SKn 1) of which the mining right area forms part has 15 endemic plant species. The Namaqualand Klipkoppe Shrubland occurs at an elevation of <600 – 1300m, or in moister situations, such as on south and east-facing slopes or in the western part of the Kamiesberg. A significant number (>15) of endemic species occur primarily or wholly within these two vegetation types, but which may be partly a function of insufficient habitat or locality information, and also partly a function of the physical extent of these two vegetation types, which cover very large areas in Namaqualand. Namaqualand Klipkoppe Shrubland fades into various forms of Succulent Karoo at lower elevations, and on the dry eastern fringes of the Kamiesberg (at the relatively high altitude of 1000m) changes into Platbakkies Succulent Shrubland (and Blomveld).

Namaqualand Heuweltjieveld (SKn 4)

This vegetation type occurs in the Northern Cape, at the western foothills of the Namaqualand Escarpment from west of Steinkopf south-wards to Soebatsfontein and Kotzesrust, at an altitude ranging from 100 - 540m over most of the area, and is found on undulating plains leading up to the Escarpment with a mosaic of communities on heuweltjies (slightly raised, rounded termite mounds up to 10m in diameter) and in between the heuweltjies is shrubland with a canopy cover (20 – 45%) dominated by leaf-succulent shrubs.

Namaqualand Riviere (AZi 1)

This vegetation type is found along dry riverbeds throughout Namaqualand, especially the Buffels River, which forms the southern boundary of the mining right, with an altitude range of 0 m – 800 m. The vegetation and landscape features include a complex of alluvial shrubland and patches of tussock graminoids occupying riverbeds and banks of intermittent rivers. The soils are sandy alluvial soils which may be seasonally wet (late winter), and in summer patches of the crystallised salt film may cover the soil surface in slight, clayey depressions.

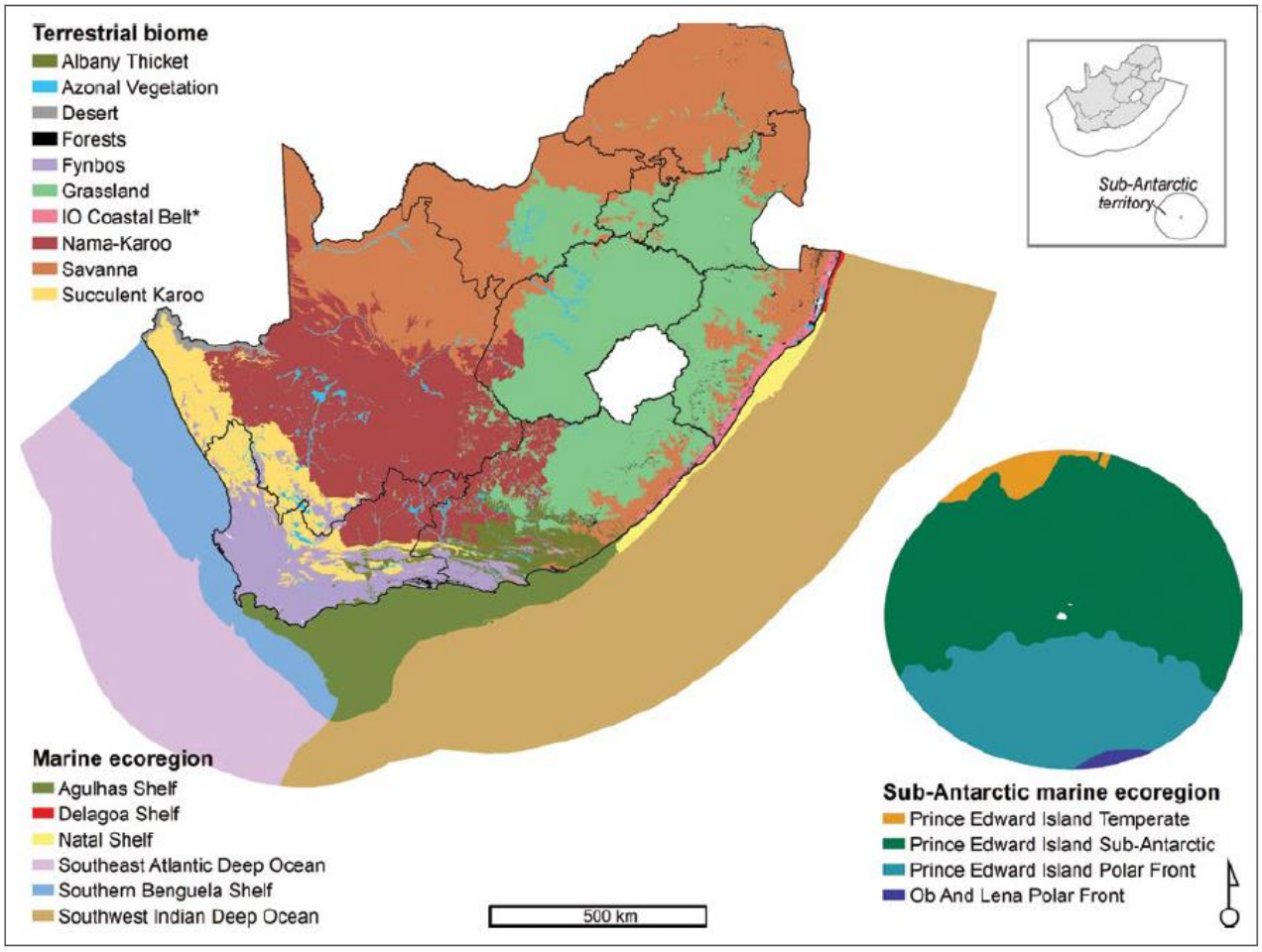


Figure 17: Overview of Terrestrial Biomes of South Africa indicating that the Succulent Karoo Biome is of relevance to the project site located along the West Coast. (Sourced from SANBI (2019); Figure 16)

8.1.7 Fauna

Endemism rates for invertebrates are high, and many unique and remarkable adaptive insects can be found in this region, including the scorpion, of which 22 are already known to be endemic to the Namakwa District Municipality. There is an abundance of reptiles and snakes in the region, many of which are near-endemic (including the Namaqua dwarf adder, which is the smallest of Africa's adders, measuring between 20-25 cm), as well as a few unique frogs such as the endemic rain frog, the marbled rubber frog, and the paradise toad. Larger herbivores are absent due to the altered habitat and competitive land uses.

Refer to **Figure 24 (page 62),** which shows the Succulent Karoo Ecosystem Programme (SKEP) database that has highlighted the fauna and flora found within the project boundary. The SKEP database identified an invertebrate species within the project area. Most wild animals are small, like the Bat-Eared Fox, Suricate (Meerkat), Barking Gecko, birds, and invertebrates. Many are nocturnal and hide in burrows in the ground during the day to avoid the hot, dry conditions.

According to the SANBI website[5], the SKEP Priority Regions are nine geographic priority areas in the Northern Cape area that were identified as the most efficient locations for achieving the conservation targets of SKEP. These geographic priority areas were refined based on their ability to contribute to the maintenance of Red Data List species and maintain important ecological processes, particularly in the face of climate change. The nine identified geographic priority areas have conservation value and are most vulnerable to increasing land-use pressures. In these priority areas, SKEP seeks to establish informal conservation networks that will achieve vegetation and process targets.

[5] https://www.sanbi.org/biodiversity/science-into-policy-action/mainstreaming-biodiversity/succulent-karoo-programme-skep/the-skep-priority-regions/

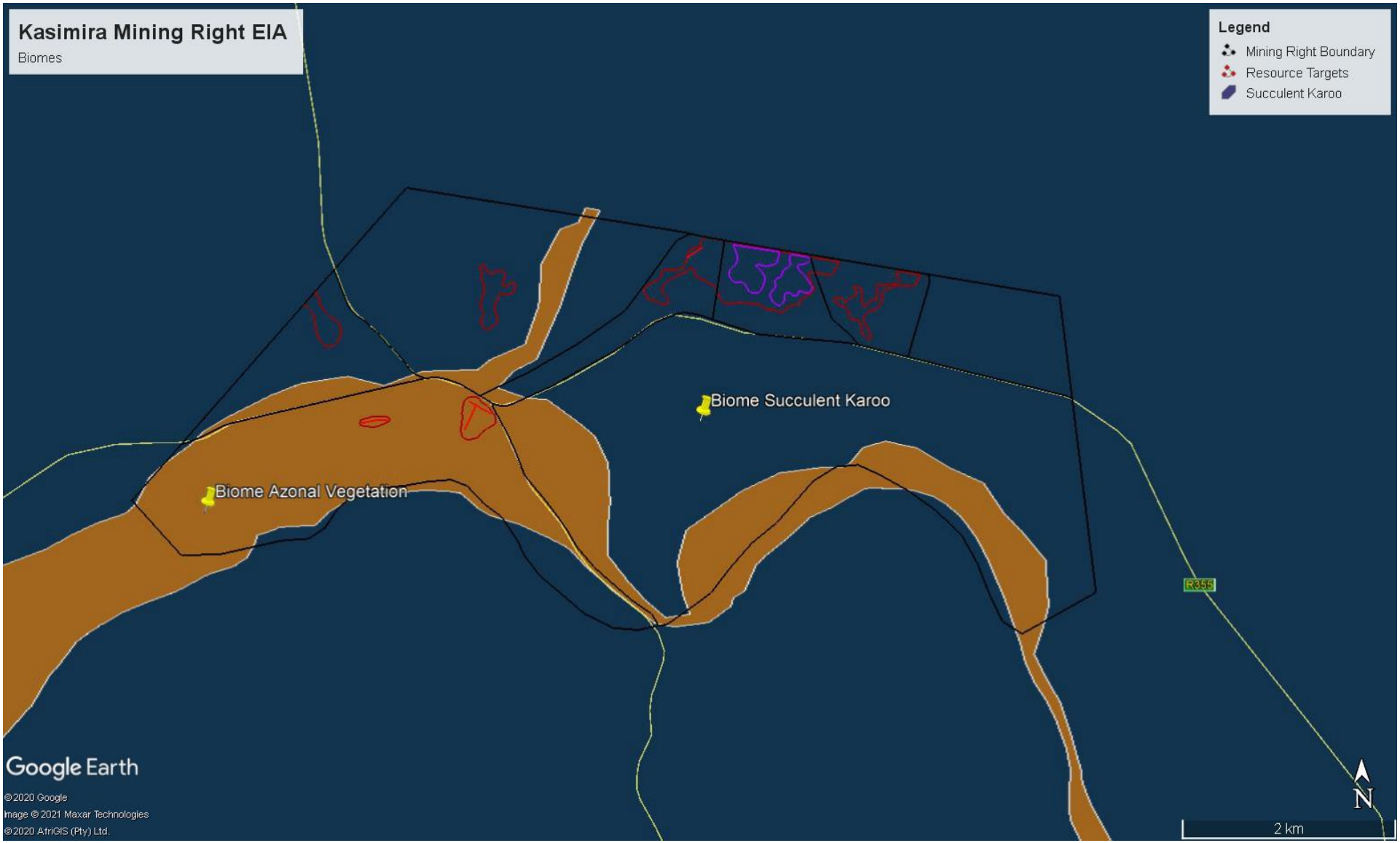


Figure 18: Biomes of the Mining Area

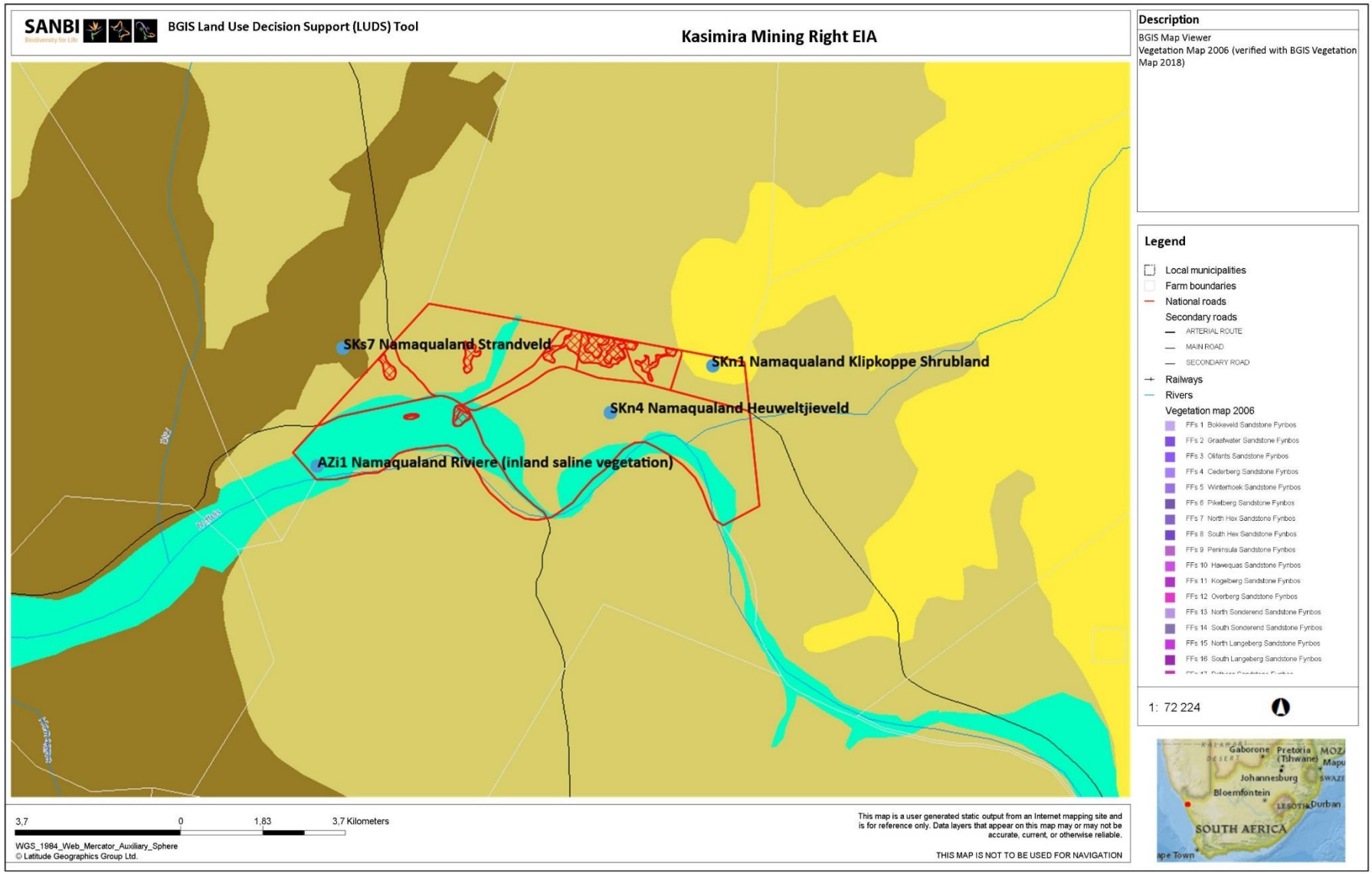


Figure 19: BGIS Vegetation Map

8.1.8 Water Resources

The project site is located within the Department of Water and Sanitation's Lower Orange Water Management Area (14) and in Quaternary Catchment F30F. Precipitation is very low occurring in the winter months. Refer to the climatic information in **Figure 15**, **page 49** above.

Surface water: Buffels River and Tributary

Figure 20 shows the mining right area in relation to the River Freshwater Ecosystem Priority Area (FEPA)[6] sub-catchments which lie outside the mining right. A small section of the Inferred Resources area is classified as a FEPA 1 area.

Water Use license requirements

The applicant has a Water Use License (Reference 25176121) in terms of Section 21(a) of the National Water Act (NWA) for the abstraction of groundwater for a total of 35 000m³ per year, and for the disposal of waste in a manner which may detrimentally impact on a water resource in terms of Section 21(g) of the NWA, which was obtained from the Department of Human Settlements, Water and Sanitation (DHSWS) dated 02/09/2019. A copy is attached at **Appendix D, page 161**.

A Water Use License for Section 21 (c) and (i) is required for the mining impact on the regulated area of the tributary and /or Buffels River. A General Authorisation has been granted, a copy of which is attached at **Appendix D, page 161**

Groundwater

Reference is made to the CapeFarmMapper[7] database, which provides information on the depth of the groundwater and electrical conductivity as shown in **Figure 21 (page 59)** and **Figure 22 (page 60),** respectively.

The depth of the groundwater as shown in **Figure 21** indicates that the groundwater is located between 21 and 30 metres below ground level (mbgl). The depth of the groundwater at the location of the processing plant and the area where the tailings disposal will be located is well below the excavation depth, which means that there is very little likelihood of encountering groundwater at these depths.

The electrical conductivity of the groundwater occurring within the mining right area is mapped in **Figure 22** as a small section to the east occurring between 370 and 520 mS/m, with most of the mining right area occurring with a very high electrical conductivity of greater than 520 mS/m. This means that the groundwater has a very high concentration of inorganic salts in solution (often comprised of sodium, potassium, calcium and magnesium) indicating that the water quality is poor and unfit for use as drinking water and exceeds the wastewater general limits[8]:

- Drinking Water (SANS 241:2015): Conductivity at 25°C (mS / m) – ≤ 170 mS/m
- Wastewater General Limits: Electrical Conductivity (mS/m) – 70 mS m above intake to a maximum of 150 mS/m.

8.1.9 Critical Biodiversity Areas

The latest conservation mapping for the Northern Cape is mapped in **Figure 23 (page 61)** indicating that there are areas of conservation significance with a CBA 1 significance in the southern sections, and a CBA2 significance in the existing mined areas to the north.

Critical Biodiversity Areas (CBAs) are areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure. These include:

[6] FEPAs are strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources. FEPAs were determined through a process of systematic biodiversity planning and were identified using a range of criteria for conserving ecosystems and associated biodiversity of rivers, wetlands, and estuaries. FEPA maps are suitable to use at a desktop level for planning and decision-making processes at the national or water management area level. In general, confidence in the FEPA maps at a national level is high but decreases at more local levels of planning.

[7] https://gis.elsenburg.com/apps/cfm/

[8] https://selectech.co.za/learn-water-testing-electrical-conductivity/

- All areas required to meet biodiversity pattern (e.g., species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland, and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and,
- Critical corridors to maintain landscape connectivity.

CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural conditions. Only low-impact, biodiversity-sensitive land uses are appropriate. A distinction is made between CBAs that are likely to be in a natural condition (CBA 1) and those that are potentially degraded or represent secondary vegetation (CBA 2). This distinction is based on the best available land cover data.

Refer to **Figure 25**, **page 63** below, which shows that the mining right area has sections demarcated in Category B, and Category D in the existing mined areas, in terms of the "Mining and Biodiversity Guidelines" categories referenced from the SANBI BGIS map viewer from 2013.

8.1.10 Screening Tool and Site Sensitivity Verification Report

Refer to **Appendix C**, **page 136**, which details the findings of the Screening Tool (**Table 9**), and the Site Sensitivity Verification Report.

The sensitivities listed below were identified in the Screening Report for Farm Wolfberg 187:

Table 9: Summary of Screening Tool Report Sensitivities

THEME	SCREENING TOOL SENSITIVITY RATING
Terrestrial Biodiversity	Very High
Aquatic Biodiversity	Very High
Archaeological and cultural	Very high
Animal Species	Medium
Agriculture	Medium
Plant Species	Medium
Palaeontology	Medium
Civil Aviation	Low
Defence	Low

The Target Areas shown in **Figure 5**, **page 9,** are located within areas disturbed by existing and historical prospecting activities. The Target Areas will be isolated areas of disturbance within an area that is already heavily disturbed by bulk sampling and which will not result in the creation of linear barriers of great length and width preventing species mobility between habitats. The "Protocols" require that the EAP or a specialist verify the screening tool report findings. **Table 10** below, provides a summary of the EAP's recommendations.

Table 10: Summary of Recommendations based on Site Sensitivity Verification

SENSITIVITY THEME	FINDINGS OF SITE SENSITIVITY VERIFICATION REPORT & COMMENT ON SPECIALIST INPUT
Terrestrial Biodiversity	Rated as LOW by the EAP: • A Terrestrial Biodiversity Compliance Statement is not deemed required by the EAP. Due to the scarce vegetation and already disturbed nature of the site, the proposed mining activities will have a minimal impact on the terrestrial biodiversity, and mitigation measures or monitoring requirements are included in the **EMPr**. • There is a deviation from the Plan of Study for EIA regarding the inclusion of a Compliance Statement as identified in the Site Sensitivity Verification Report. • The biodiversity specialist was unable to meet the stipulated deadline despite taking a period of 3 months, which included waiting for the rainfall season to commence. The specialist comment is therefore not included in this DEIAR.
Aquatic Biodiversity	Rated as LOW by the EAP: • An Aquatic Biodiversity Compliance Statement is not deemed required by the EAP. Due to the prospecting and bulk sampling activities and disturbed nature of the site, the

	proposed mining activities will have a minimal impact on the aquatic biodiversity, and mitigation measures or monitoring requirements are included in the **EMPr**.
Terrestrial Animal Species	Rated as LOW by the EAP: • Terrestrial Animal Species Compliance Statement required to confirm whether SCC is found on-site or confirmed as likely to be present, which would then require a Terrestrial Animal Species Specialist Assessment. See comments above under Terrestrial Biodiversity. • There is a deviation from the Plan of Study for EIA regarding the inclusion of a Compliance Statement as identified in the Site Sensitivity Verification Report. • The biodiversity specialist was unable to meet the stipulated deadline despite taking a period of 3 months, which included waiting for the rainfall season to commence. The specialist comment is therefore not included in this DEIAR.
Terrestrial Plant Species	Rated as LOW by the EAP: • Terrestrial Plant Species Compliance Statement required subject to confirmation of SCC found on-site or confirmed as likely to be present, which would require a Terrestrial Plant Specialist Assessment Report. See comments above under Terrestrial Biodiversity. • There is a deviation from the Plan of Study for EIA regarding the inclusion of a Compliance Statement as identified in the Site Sensitivity Verification Report. • The biodiversity specialist was unable to meet the stipulated deadline despite taking a period of 3 months, which included waiting for the rainfall season to commence. The specialist comment is therefore not included in this DEIAR.
Archaeological cultural, and Palaeontology	The rating remains as VERY HIGH and MEDIUM respectively: • Heritage Impact Assessment (HIA), required in terms of the National Heritage Act (Act 25 of 1999), to include palaeontological assessment.
Civil Aviation	Rated as NOT APPLICABLE by the EAP: • Not relevant to mining.
Agriculture	Rated as NOT APPLICABLE by the EAP: • No crop production or livestock grazing is evident. No further agricultural assessment is required.
Defence	Rated as NOT APPLICABLE by the EAP: • No further investigation is required.

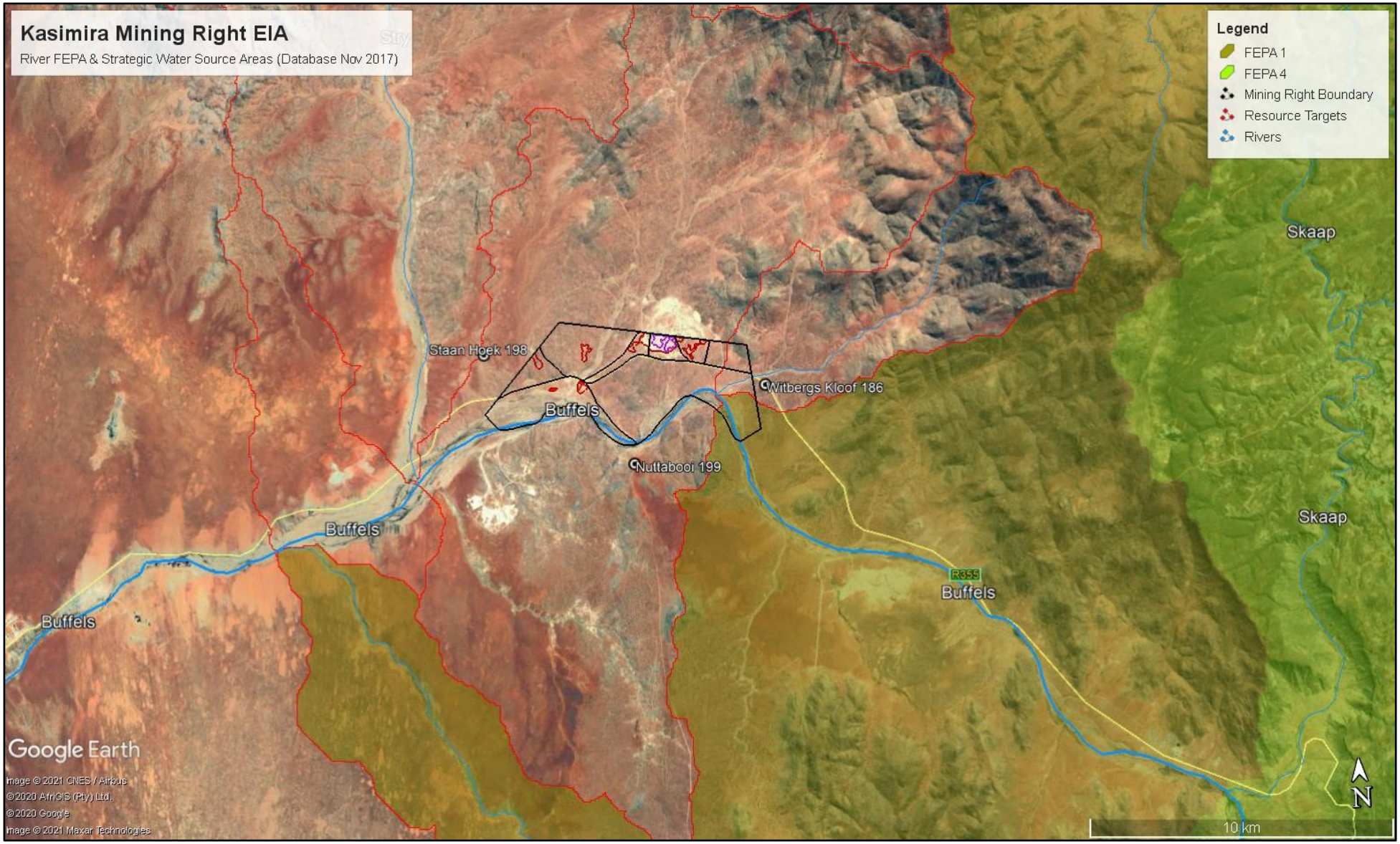


Figure 20**: River FEPA and Strategic Water Source Areas**

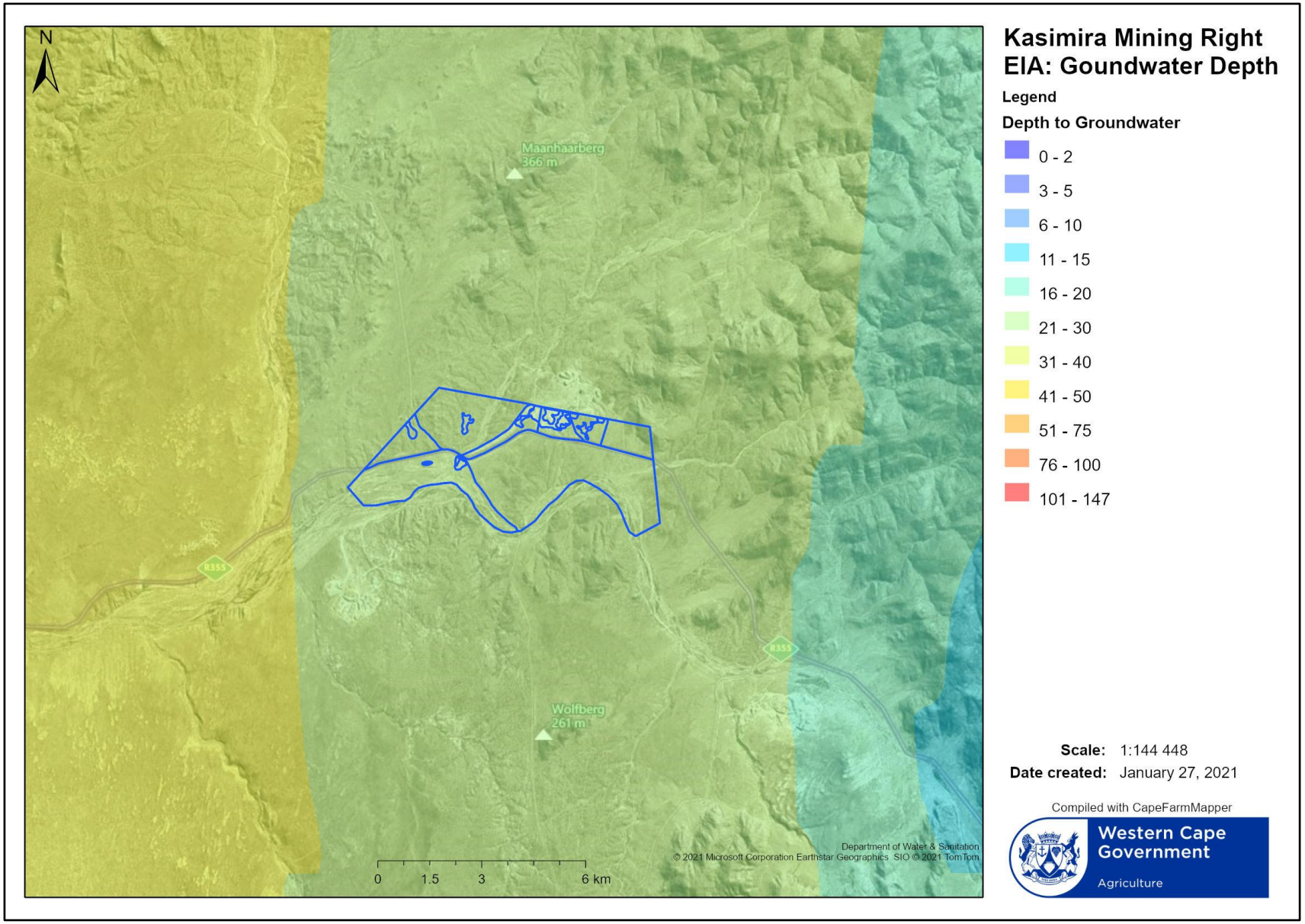


Figure 21: Depth of groundwater based on CapeFarmMapper database.

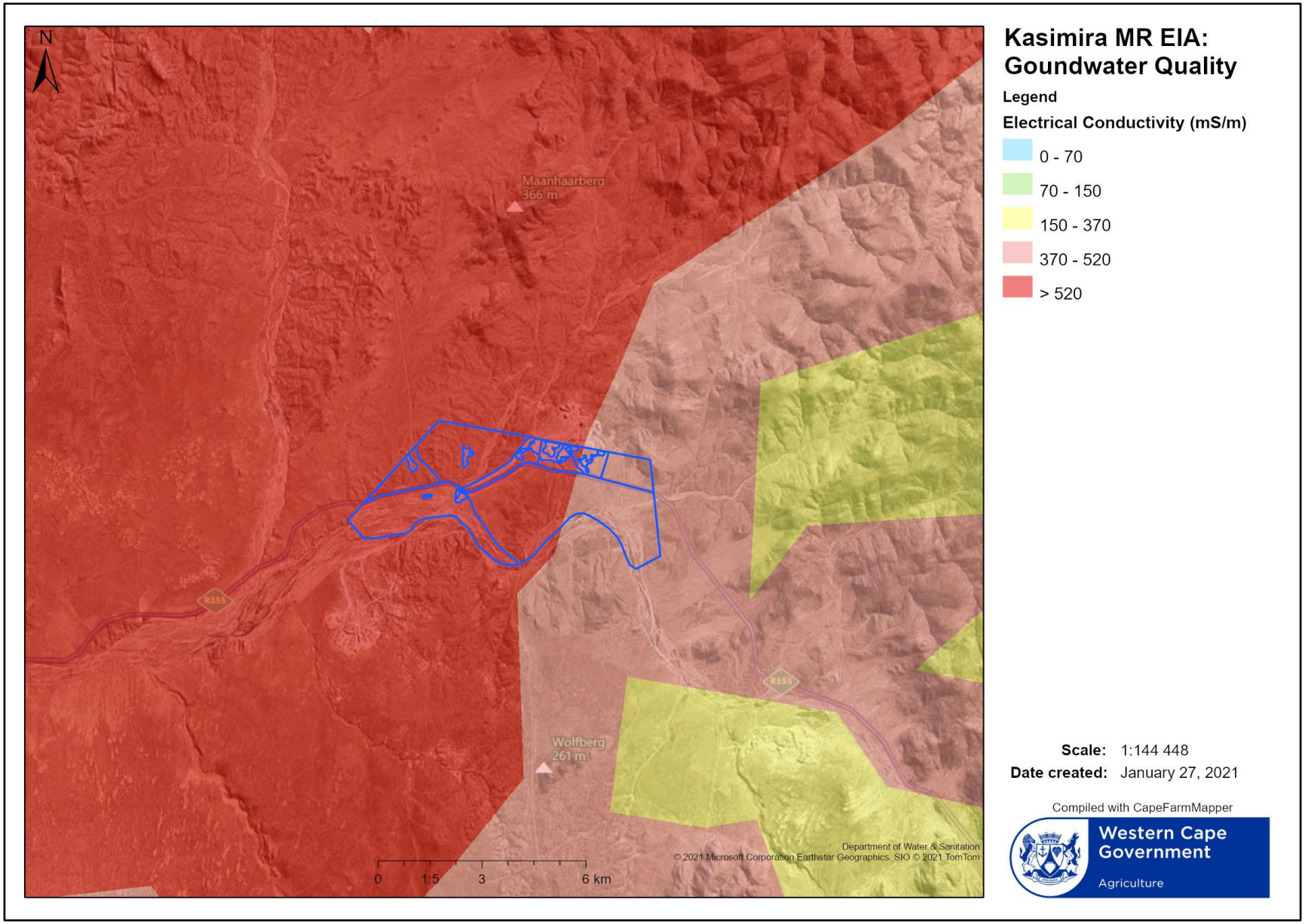


Figure 22: Groundwater quality based on CapeFarmMapper database.

Figure 23: Critical Biodiversity Areas Map of the Mining Right Area

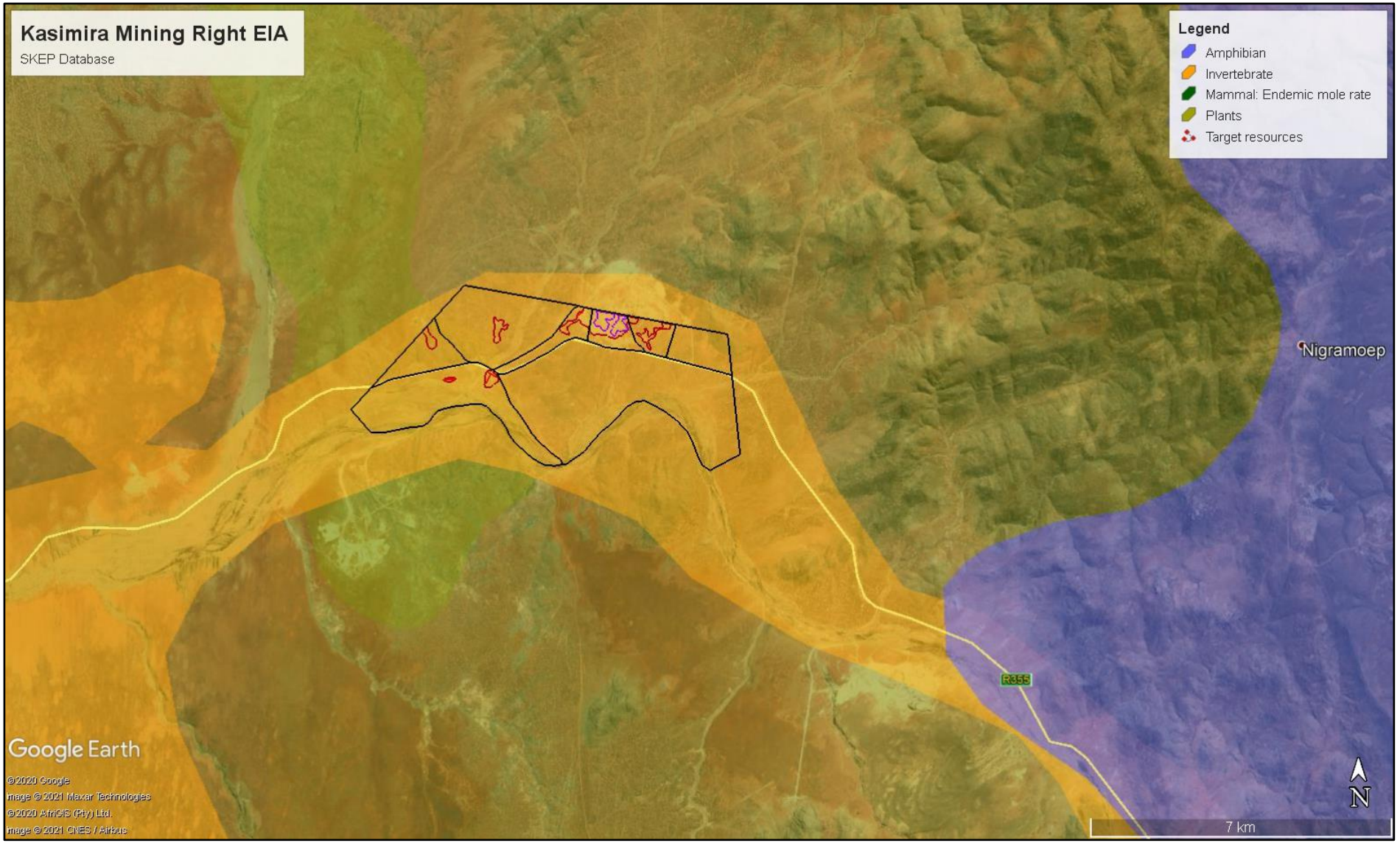


Figure 24: SKEP Fauna and Flora Biodiversity Map

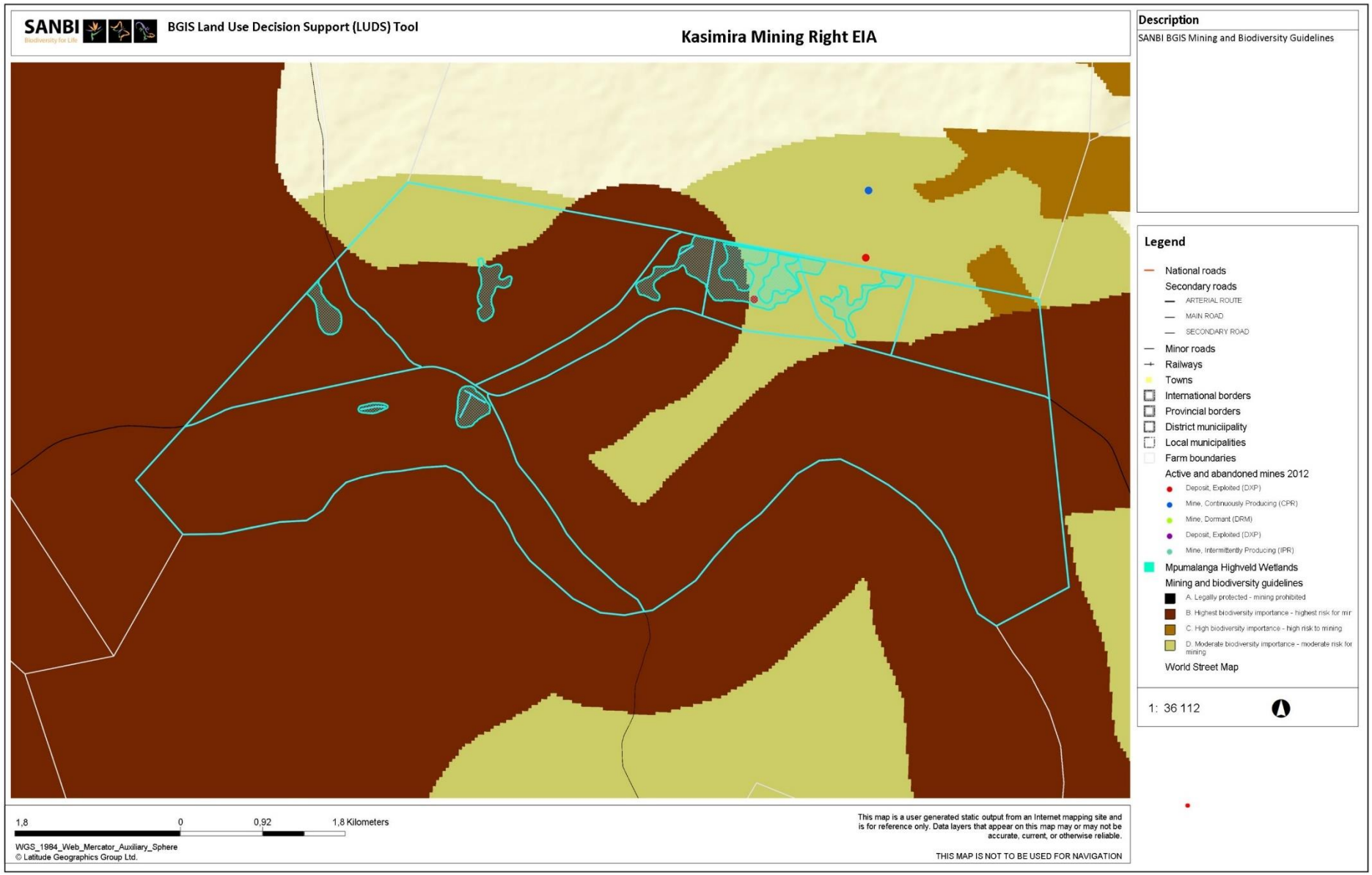


Figure 25: Location of Mining Area in terms of the "Mining and Biodiversity Guidelines" (BGIS MAP VIEWER)

8.1.11 Emissions

Air Quality

- Dust is generated by the wind blowing over un-vegetated or denuded areas and given the surrounding extent of the semi-desert environment, dust generation will occur under windy conditions. Climate change is predicted to impact on Southern Africa with an increase in temperatures and lower rainfall, which will impact on vegetation cover increasing soil mobility resulting in wind-blown soil erosion.
- Dust is generated off un-surfaced roadways when vehicles transport materials on-site and in off-loading materials to the ROM stockpile.

Noise and vibration

- The haul trucks will generate noise and vibration on the haul roads.
- The operational and processing activities will generate some noise.

Light Pollution

- The processing plant will need to have lighting for security purposes.

8.1.12 Socio-economic characteristics

Approximately 90% of the region is used for livestock grazing and production, with the remainder comprising of agriculture and urban development. Tourism is a seasonal but rapidly growing feature with visitors to the region arriving almost exclusively between July and October to take in the world-renowned yearly flower display. The project site falls within the Namakwa District Municipality, and the Nama Khoi Local Municipality (LM). The socio-economic profiles are referenced from IDPs and included below.

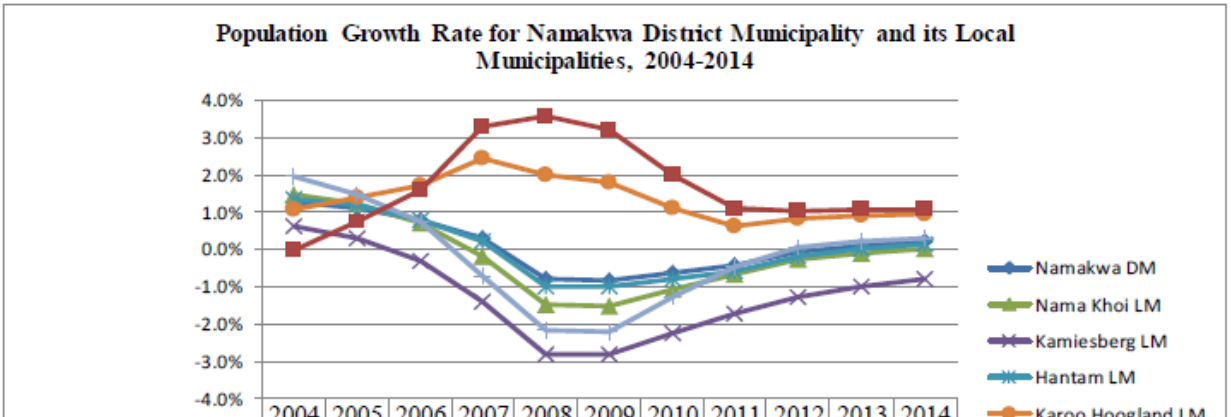
The **Namakwa District Municipality** is sparsely populated, with a population of 115 842 and is the least populated district in the Northern Cape Province (and Country, although geographically the largest) with a population comprising 10.11% of the province's total population.

- The average growth rate for GGP in the area from 1996-2011 was 5.4 % and in 2007-2011 this slowed down slightly to an average growth rate of 4.8%.
- The largest contributing sector to employment in the local economy (21.12% of total employment in the formal sector) is the retail, catering, and accommodation sectors.

The population growth rate of the Nama Khoi Local Municipality located within the Namakwa District is shown as improving from a negative growth rate to 0%, as illustrated in **Figure 26** below (sourced from the Nama Khoi Draft IDP 2018 2019).

Nama Khoi had the largest number of people employed, unemployed, economically active, and not economically active between 2004 and 2014 (**Figure 27**). In 2014 Nama Khoi made the largest contribution to employment in the following industries (**Figure 28**): mining (65.6%), manufacturing (42.6%), electricity (45.7%), trade (42.0%), transport (46.0%), finance (35.4%), community services (37.9%) and households (35.3%). This municipality also employed the largest proportion of people in the district, accounting for 38.2 per cent of the people in formal employment.

Population growth rate in Namaqua District Municipality



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Namakwa DM	1.2%	1.1%	0.8%	0.3%	-0.8%	-0.8%	-0.6%	-0.4%	-0.1%	0.1%	0.2%
Nama Khoi LM	1.5%	1.2%	0.7%	-0.2%	-1.5%	-1.5%	-1.1%	-0.7%	-0.3%	-0.1%	0.0%
Kamiesberg LM	0.6%	0.3%	-0.3%	-1.4%	-2.8%	-2.8%	-2.2%	-1.7%	-1.3%	-1.0%	-0.8%
Hantam LM	1.3%	1.2%	0.8%	0.2%	-1.0%	-1.0%	-0.8%	-0.6%	-0.2%	0.0%	0.1%
Karoo Hoogland LM	1.1%	1.4%	1.7%	2.4%	2.0%	1.8%	1.1%	0.6%	0.8%	0.9%	0.9%
Khai-Ma LM	2.0%	1.4%	0.7%	-0.7%	-2.2%	-2.2%	-1.3%	-0.5%	0.0%	0.2%	0.3%
Richtersveld LM	0.0%	0.7%	1.6%	3.3%	3.6%	3.2%	2.0%	1.1%	1.0%	1.1%	1.1%

Figure 26: Population growth rate in the Namaqua District Municipality (Source: Nama Khoi Draft IDP 2018 2019)

In 2014 the Nama Khoi LM contributed to mining, transport, and electricity in terms of employment, as shown in **Figure 27** below.

Employment Contributions by LM

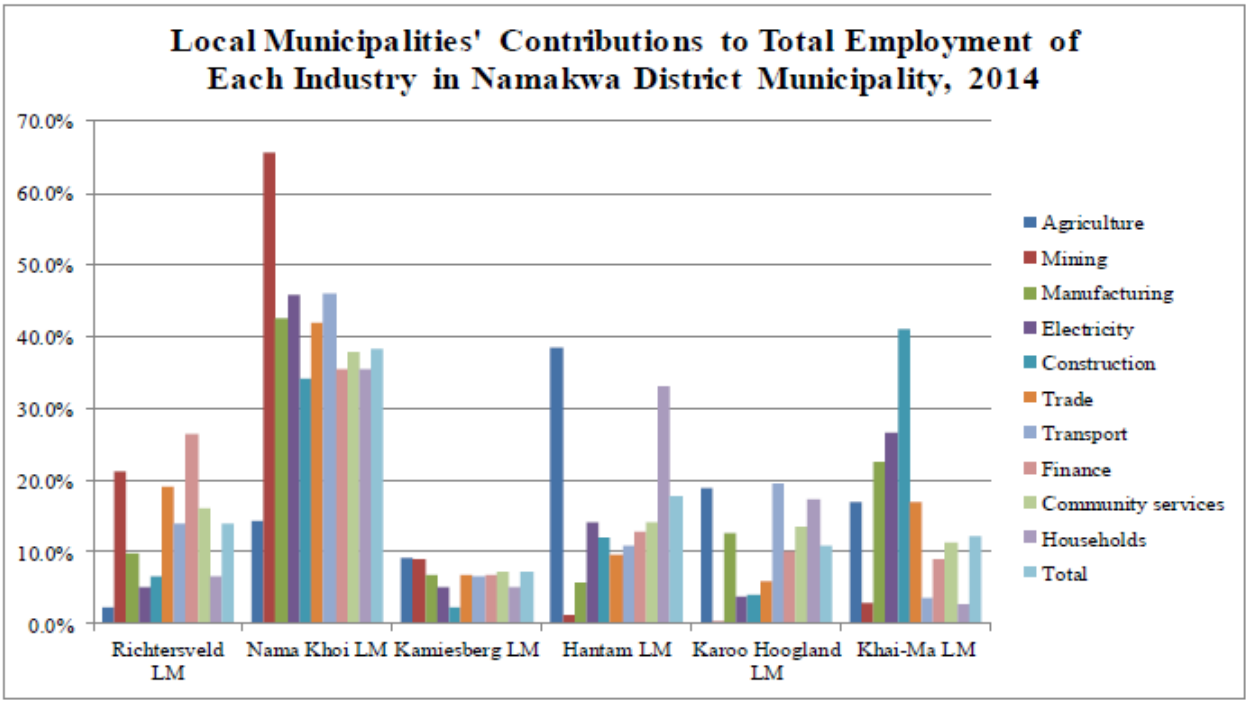


Figure 27: Employment Contributions by Local Municipality (Source: Nama Khoi Draft IDP 2018 2019)

Mining, community services and trade were the largest employing industry in 2014 in the Nama Khoi Local Municipality as illustrated in **Figure 28** below.

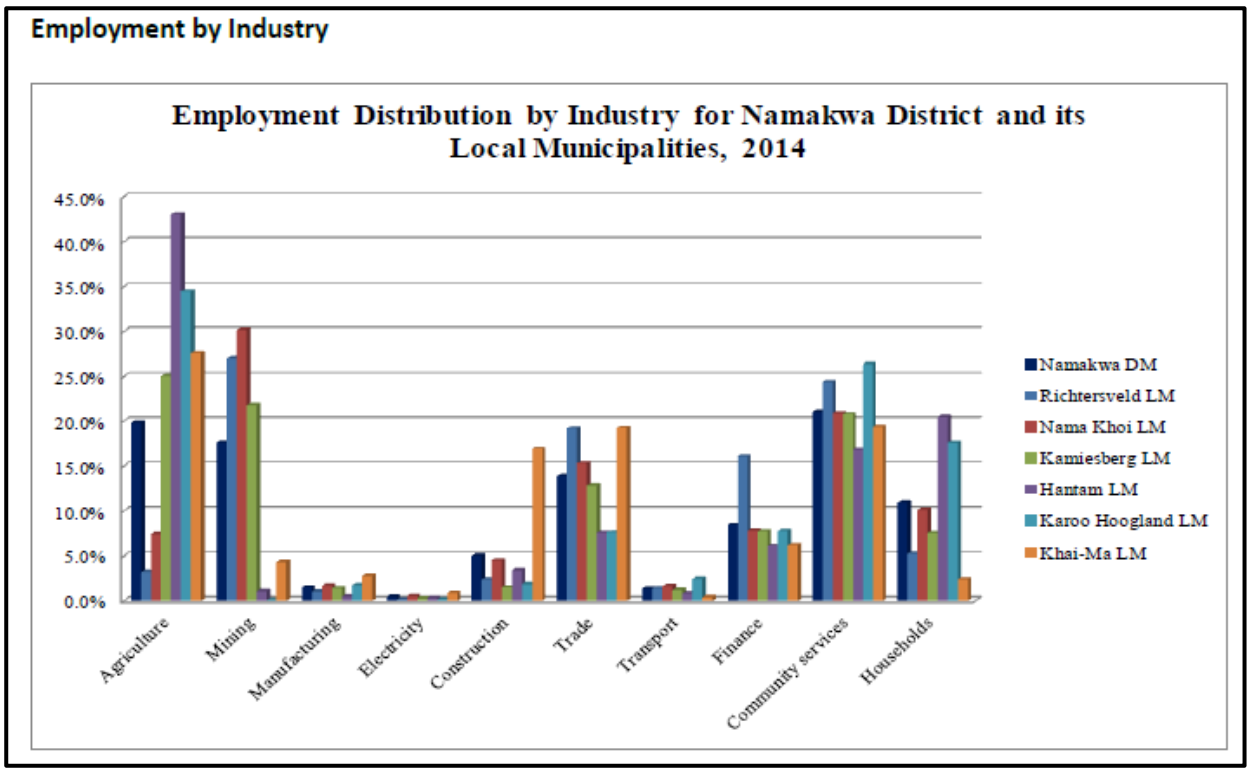


Figure 28: Employment distribution by Industry (Source: Nama Khoi Draft IDP 2018 2019)

8.1.13 Cultural, Heritage and Palaeontological Resources

8.1.13.1 Heritage Impact Assessment

A **Heritage/Archaeological Impact Assessment** was prepared by ASHA Consulting (Pty) Ltd (attached as **Appendix E1: Heritage Impact Assessment**, page 176), as referenced in this report and to be submitted to the South African Heritage Resources Agency (SAHRA) during the 30-day public participation comment period. The recommended mitigation measures from **Appendix E1: Heritage Impact Assessment**, **page 176** have been included in this Report.

The Heritage Impact Assessment Report states the following summary:

> *The field survey found a variety of archaeological sites including several LSA sites, mostly along the bank of the Buffels River, and a historical copper mining complex that includes two small mine pits, several historical artefact scatters and four ruined structures. A small informal 'graveyard' with two graves (one adult, one child) was located a short distance away.*

The following recommendations are made (as per Heritage Impact Assessment, page 176):

- *The fossil find procedures must be incorporated into the EMPr and applied whenever fossil finds are made. This includes the reporting of all finds to a palaeontologist;*
- *The identified significant archaeological sites and their buffers must be included on mine maps and if any are to be disturbed for any reason then archaeological mitigation must be effected (under a permit issued by SAHRA) and approved by SAHRA prior to commencement of mining work;*
- *The historic copper mining complex and grave site should be avoided altogether (see Grade IIIA sites on Figure 50 of the HIA); and*
- *If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.*

8.1.13.2 Palaeontological Assessment

A **Palaeontological Impact Assessment** of the area was provided by John Pether, a Geological and Palaeontological Consultant, to determine the palaeontological sensitivities of the affected areas (see **Appendix E2: Paleontological Impact Assessment, page 227**).

The report states the following:

> *"As far as the writer is aware no fossils of any description have been reliably reported from the Miocene and Pliocene fluvial terrace deposits of the Buffelsrivier, or from the overlying Quaternary colluvial and aeolian sequences. It is evident that fossils are very rare in these deposits and consequently the impact of the bulk sampling, re-processing of mined material and rehabilitation works is considered to be LOW (Appendix 1)* (of the HIA). *On Wolfberg 187, the fossil potential is further reduced by the extent of reworking of the original deposits, during which pre-existing fossils would have been exhumed and destroyed.*
>
> *Notwithstanding the apparent paucity of fossils in the Buffelsrivier fluvial deposits, the possibility that some could be discovered cannot be dismissed. In view of the lack of age constraints from fossil mammal bones, any identifiable find would be of scientific importance. In addition to rare fossil bone material the following fossils could occur:*
>
> - *Lignified or petrified wood fragments.*
> - *Plant impressions in mudstone beds.*
> - *Moulds of dissolved aquatic bivalves and gastropods.*
> - *Petrified teeth of mammals, reptiles and fish, varying from pebble-size to a few mm.*
>
> *Petrified teeth are found in the heavy concentrates of the coastal diamond mines and have provided critical age constraints for our understanding of coastal-plain geohistory (Pickford & Senut, 1997). Similarly, it seems that finds in concentrates hold the most promise for a diagnostic fossil find from the Buffelsrivier deposits.*
>
> *The piles of waste rock around the previous mining area, large chunks of the mainly sandstones which overlaid the basal gravels, have a certain fossil potential in that much more of the material is exposed relative to a vertical face in an excavation.."*

The following mitigations are proposed:

> *Open-pit mine excavations are a scientific and fossil resource and have been the major contributor to the understanding of the deposits and palaeontology of the Namaqualand coastal plain. Mine personnel have played a critical role in bringing fossil finds to the attention of the international scientific community. However, these have generally been the rare, visually-obvious large finds of many bones. Scattered finds and small fossils sparsely distributed in the deposits are generally missed or overlooked, as has probably been the case for the Buffelsrivier fluvial deposits. Indeed, most coastal diamond mine exposures also do seem to lack fossils, but these are discovered during the few occasions when mine geologists and guest scientists doing research projects have undertaken systematic, close-range scrutiny of the pit walls, which is not a routine mining activity.*
>
> *The sampling and mining on Wolfberg 187 could have a positive impact with respect to understanding the stratigraphy and to palaeontological heritage, providing that adequate mitigation measures are in place and duly performed over the duration of the mining.*
>
> *As it is impractical for a specialist to routinely monitor the mine pit and mined material, routine monitoring can only be achieved by the co-operation of the people on the ground. By these are meant personnel in supervisory/inspection roles, such as the pit foremen, geologist, surveyor and environmental monitoring officer, who are willing and interested to look out for occurrences of fossils. A monitoring presence is critical for spotting fossils as they are uncovered and stopping further damaging excavation.*

It is recommended that a requirement to be alert for fossil materials and archaeological material be included in the Environmental Management Plan (EMP) for the sampling, mining and rehabilitation operations. The Environmental Control Officer (ECO) and mining supervisor must inform staff of the need to watch for potential fossil occurrences.

Based on the lack of fossil finds hitherto, and personal observations, a major concentration of fossil bones is not expected. Nevertheless, in case of a chance discovery of fossil bone material, both in new excavations and in the disturbed materials, a Fossil Finds Procedure" (FFP) is provided in Appendix 2 (of the PIA)*. It is expected that such finds would be in the category of "allowed" rescue by mine staff, i.e., as for isolated bone finds in the FFP.*

As mentioned above, finds of petrified teeth in concentrates hold the most promise for a diagnostic fossil find from the Buffelsrivier deposits. Importantly, the previous finds have come from small-scale, "hands-on" operations using rotary pans and Pleitz jigs to concentrate heavy minerals, such as the proposed operations by Kasimira. Whereas, in the large mine, high-throughput concentration systems using Heavy Media Separation (HMS) plants and X-ray Sortex-type machines to extract diamonds in a "hands off" security regime, the petrified fossils in the concentrate are not captured.

It is highly recommended that mine staff must be empowered to rescue the petrified fossil material that is retained in the rotary pan concentrates and which is seen during their sorting.

8.2 Description of the current land uses

Figure 16 provides an overview of the current land use of the project area as sourced from the BGIS Map Viewer, as further described in Section 8.1.3 above.

8.3 Description of specific environmental features and infrastructure on the site

- Refer to the **Figure 5**, which shows the Target Areas 1 to 6 are "in situ" and Target Areas 7 and 8 are "ex-situ".
- **Figure 13 to Figure 28** and the corresponding paragraphs in Section 8.1 describe the environmental features of the biophysical and socio-economic characteristics of the mining right area.

8.4 Environmental and current land use map

Refer to Section 8.2 and 8.3 above.

9 IMPACTS IDENTIFIED

The potential risks arising from the mining operation discussed in Section 3 above are applicable to the proposed mining right application as listed below.

9.1 Potential Risks/Impacts

9.1.1 Potential Risks associated with mining

- Safety of personnel operating large earth-moving equipment.
- Management of dust, noise and vibration associated with mining activities, in relation to surrounding communities.
- Potentially dangerous areas like excavations or equipment left behind and uncontrolled access to potentially unsafe post-mining areas.

9.1.2 The potential risk of environmental impacts

- Disturbance to sensitive environments such as land with historical or conservation value, watercourses, terrestrial habitats, fauna and flora and any associated biodiversity corridors, and on high potential agricultural land.
- Potential contamination of groundwater from tailings, unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.
- Waste classes are not kept in separate streams and incomplete removal of waste.
- Stockpiles and leftover products remaining after mining.
- Loss of indigenous vegetation due to disturbed footprints at mining sites.
- Increased soil erosion causing loss of topsoil.
- Climate change causing an increase in temperature and decrease in rainfall, reducing vegetation cover leading to wind-blown soil erosion.
- Dust generation from unsurfaced roads.
- Chemical contaminants impacting surface and/or groundwater quality or resulting in discharge that exceeds the concentrations permitted.
- Vehicle wash bays and workshop facilities produce petrochemical and solvent contaminated runoff.
- Sanitary conveniences, fuel depots or storage facilities of potentially polluting substances can contaminate surface water.
- Oil fuel leaks onto soil through the earthmoving and transport equipment and machinery or spillage of fuel during the transfer from fuel bowser to equipment.
- The post-mining landscape increases the requirement for long-term monitoring and management.
- Unwanted ruins, buildings, foundations, footings, and waste management practices creating or leaving legacies.
- Sub-surface infrastructure remaining behind, limiting the intended post-closure land use including footings and foundations, power supply and water installations including pumps and pipelines.
- Equipment and other items used during the mining operation were left behind.
- Incomplete removal of re-usable infrastructure.
- Rubble from demolished infrastructure left behind.
- Post-mining topography is not compatible with the original landform.

9.1.3 Potential risks associated with viable and sustainable land

- Uncontrolled expansion of mining footprint by not restricting the area disturbed by mining and the associated activities/infrastructure, resulting in loss of land with agricultural potential. Uncontrolled development of roads where existing farm roads is not used for mining operations and redundant internal roads are left behind.
- The post-mining landform is not compatible with the surrounding landscape and not capable of productive land use that achieves a land capability equal to that of pre-mining conditions

- Long term changes in land use are caused by not implementing prompt rehabilitation and maintenance of disturbances when possible as part of the annual Rehabilitation Plan.
- Unsuccessful rehabilitation can reduce the post-mining land use options. Rehabilitated areas could be too unstable to support post-mining land use objectives compatible with surrounding areas.
- Disturbance of ecology due to loss of habitat and cumulative impact of illegal collecting during long-term or life of mine can degrade areas and reduce the viability of adjacent areas.
- Inadequate control of alien invasive vegetation species can result in the establishment of populations or seed sources that threaten adjacent areas.

9.1.4 Potential Risks associated with a post-mining landform

- Impact on surface water through modification of infiltration rates by increasing the extent of hardened surfaces.
- Inadequate topsoil restoration or creation of unnatural surface topography or slope form which could impact lower or adjacent slopes due to increased runoff velocity.
- Altered stormwater runoff response due to large impervious areas and concentrated runoff in drainage systems. Concentrated storm runoff from infrastructure areas is erosive, causing sheet, rill and donga erosion features.

9.1.5 Potential Risks associated with the socio-economic environment

- Disturbance of local communities in urban and rural areas caused by noise and dust emissions and increase in heavy vehicles along transport routes.
- An influx of people into the local communities looking for work, with an increase in demand for housing, schooling, and services. Such an influx of workers into a community often results in a change in social dynamics.
    - Positive impacts include, for example, the creation of both formal and informal businesses to supply additional needs.
    - Negative social impacts include, for example, an increase in substance abuse, HIV transmission and unwanted pregnancies.
- Staff losing their jobs at mine closure can have devastating effects on communities that are reliant on mine-based income.
- Job losses of secondary industries, businesses and contractors and contractual agreements with service providers surpassing mine closure date.
- Lack of compliance with the approved **EMPr** and a lack of auditing of the **EMPr**.
- Mining activities closure stalled due to non-compliance with relevant legislation (national, provincial, and local).
- Insufficient funds for complete rehabilitation.

9.1.6 Potential Risks associated with visual intrusion, noise, vibration, light pollution and air emissions

- Terrain morphology plays a critical role in defining the visual envelope of mining developments and can either reduce or enhance visual impact. Apart from visual intrusion, there is also the risk of a reduced sense of place. The visual intrusion impact of mining activity would be on nearby roads, homesteads, settlements, tourist accommodation, and along tourism routes or corridors.
- The visual disturbance would be caused by mining activities such as excavations. Buildings provide a colour contrast, as do disturbed areas against adjacent natural areas.
- Nuisance effects of air emissions due to a lack of implementation of dust suppression activities could impact on communities.
- Dust generated on haul roads reduces visibility, representing a safety hazard.
- Dust can retard vegetation growth and reduce the palatability of vegetation.
- The cumulative effect of a rise in the ambient noise levels or high noise levels in specific areas that exceed specified levels would impact on communities in close proximity.
- Noise disturbance and light pollution would result from night-time activities (if applicable) in areas that are in close proximity to communities.

9.1.7 Potential Risks associated with regard archaeological sites, cultural heritage sites or graves

- Disturbance of identified surface, or unknown sub-surface archaeological sites, if mitigation and monitoring are not implemented as per mitigating measures in a Heritage Impact Assessment and Paleontological Impact Assessment.
- Progressive development can encroach upon or disturb archaeological sites, cultural heritage sites or graves.

9.2 Potential Impacts and Risks associated with the Preferred Alternative.

Refer to Section 6 above, which describes the location, type of activity, design or layout, technology and operational alternatives, and the preliminary result of having a preferred and only alternative, that of the Mining Right as per **Figure 4 & Figure 5**. The potential impacts and risks associated with this preferred and only alternative are listed in **Table 11** below.

Table 11: Preferred Alternative: Potential Impacts and Risks per Phase per Activity

Phase	Activities	Potential Impacts & Risks	Significance (before mitigation)	Probability	Duration	Significance after mitigation
CONSTRUCTION PHASE	Access & Haul Roads	Dust generation from vehicles using existing access and haul roads	Medium (-)	Definite	Short-term	Low
		Soil compaction from repeated use of existing access and haul roads	Medium (-)	Definite	Short-term	Low
	Construction of Site Establishment Activities: • Processing plant and associated infrastructure • Water and wastewater infrastructure • Electricity infrastructure • Waste management • Stormwater control • Access roads	Topsoil stripping and stockpiling, soil erosion and soil compaction (land capability)	Medium (-)	Definite	Short-term	Low
		Surface and groundwater resource pollution	Medium (-)	Possible	Short-term	Low
		Biodiversity (wildlife and vegetation) disturbance from activities and vehicles	Medium (-)	Definite	Short-term	Low
		Soil contamination and waste management	Medium (-)	Possible	Short-Term	Low
		Visual impact	Medium (-)	Definite	Short-term	Low
		Emissions (Dust and light), Noise and Vibration causing nuisance from topsoil stripping, site establishment activities and vehicles	Medium (-)	Definite	Short-term	Low
		Lack of socio-economic impact on job security, employment creation and economic spin-offs (i.e., prior to mine construction)	Medium (-)	Definite	Short-term	Medium (+)
		Impact on archaeological resources and graves	High (-)	Very likely	Permanent	Low (-)
		Impacts on palaeontological resources	Very Low (-)	Possible	Long-term	Very Low (-)
OPERATIONAL PHASE	• Services and associated infrastructure • Primary Processing operation • Tailings Storage Facility	Change in topography	Medium (-)	Definite	Long-term	Low
		Erosion control or runoff diversion structures and soil compaction (land capability)	Medium (-)	Definite	Long-term	Low
		Water resources: potable water and process water to be abstracted from the existing boreholes and recycled during operation; watercourses impacted on by mining activities in the regulated area; potential for groundwater pollution from hydrocarbons.	Medium (-)	Possible (surface water resources) Unlikely (groundwate	Long-term Long-term	Low Very Low

Phase	Activities	Potential Impacts & Risks	Significance (before mitigation)	Probability	Duration	Significance after mitigation
	• Water and wastewater management • Waste generation and management • ROM stockpiles • Access roads			r resource pollution)		
		Biodiversity (wildlife and vegetation) disturbance from activities	Medium (-)	Definite	Long-term	Low
		Soil contamination and waste management	Medium (-)	Possible	Short-Term	Low
		Visibility of mining operations	Medium (-)	Definite	Long-term	Low
		Dust, vehicle, noise and light emissions from site activities and haul trucks	Medium (-)	Definite	Long-term	Low
		Lack of socio-economic impact on job security, employment creation and economic spin-offs (i.e., prior to mining)	Medium (-)	Definite	Long-term	Low
		Impact on archaeological resources and graves	High (-)	Very likely	Permanent	Low (-)
		Impacts on palaeontological resources	Very Low (-)	Possible	Long-term	Very Low (-)
DECOMMISSIONING PHASE	Rehabilitation of the mining right area: shaping landscape profile; landscape the waste rock dumps; scarifying compacted areas and vehicle tracks; replacing topsoil, etc.	Rehabilitation: Visibility of the rehabilitated mining operations; Biodiversity (wildlife and vegetation) disturbance from vehicles; Dust and vehicle emissions from rehabilitation activities; Erosion control or run-off diversion structures	Medium (-)	Definite	Long-term	Low
		Socio-economic impacts: employment during rehabilitation and decommissioning activities.	Medium (-)	Definite	Short-term	Medium (+)
		Impact on archaeological resources and graves	High (-)	Very likely	Permanent	Low (-)

9.3 Potential Impacts and Risks associated with the No-Go Alternative

There would be no change to the biophysical environment with the No-Go Alternative. The No-Go Alternative implies that the Applicant would forgo an opportunity to provide employment opportunities in an area and sector identified for opportunities for job provision and economic growth, and the sourcing of diamonds. This potential would not be reached with the "no-go" option.

9.4 The methodology used in determining the significance of potential impacts

Refer to **Table 12** below, which provides the impact assessment criteria applied in the rating of the impacts associated with each phase of the proposed mining activity for the Preferred and Only Alternative. Each impact is assessed in terms of: nature (character status); extent (spatial scale); duration (time scale); probability (likelihood) of occurring; reversibility of the impact; the degree to which the impact may cause irreplaceable loss of resources; the significance (size or magnitude scale) prior to mitigation; the degree to which the impact can be mitigated; and the significance (size or magnitude scale) after mitigation.

Table 12: Impact Assessment Criteria (GDSC Table)

ASSESSMENT CRITERIA	
NATURE	
Positive	Beneficial to the receiving environment
Negative	Harmful to the receiving environment
Neutral	Neither beneficial nor harmful
EXTENT (GEOGRAPHICAL)	
Site	The impact will only affect the site
Local/ district	Will affect the local area or district
Province/region	Will affect the entire province or region
International and National	Will affect the entire country
CONSEQUENCE	
Loss/gain	The impact will result in loss or gain of resource
No loss/gain	The impact will result in no loss or no gain of resource
DURATION	
Construction period / Short term	Up to 3 years
Medium term	Up to 6 years after construction
Long term	More than 6 years after construction
PROBABILITY	
Definite	Impact will certainly occur (>75% probability of occurring)
Probable	Impact likely to occur (50 – 75% probability of occurring)
Possible	Impact may occur (25 – 50% probability of occurring)
Unlikely	Impact unlikely to occur (0 – 25% probability of occurring)
REVERSIBILITY	
Reversible	Impacts can be reversed through the implementation of mitigation measures
Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures
IRREPLACEABLE LOSS OF RESOURCES	
High	The impact results in a complete loss of all resources
Medium	The impact will result in a significant loss of resources
Low	The impact will result in marginal loss of resources
No Loss	The impact will not result in the loss of any resources
CUMULATIVE EFFECTS	
High	The impact would result in significant cumulative effects
Medium	The impact would result in moderate cumulative effects
Low	The impact would result in minor cumulative effects
SIGNIFICANCE RATINGS	
Very High	Major to permanent environmental change with extreme social importance.
High	Long term environmental change with great social importance.

Medium	Medium to long term environmental change with fair social importance.
Low	Short to medium term environmental change with little social importance.
Very low	Short-term environmental change with no social importance
None	No environmental change
Unknown	Due to lack of information
DEGREE TO WHICH IMPACT COULD BE AVOIDED/MANAGED/MITIGATED	
High	The impact could be significantly avoided/managed/mitigated.
Medium	The impact could be fairly avoided/managed/mitigated.
Low	The impact could be avoided/managed/mitigated to a limited degree.
Very Low	The impact could not be avoided/managed/mitigated; there are no mitigation measures that would prevent the impact from occurring.

9.5 The positive and negative impacts that the proposed activity and alternatives will have on the environment and community that may be affected

9.5.1 Positive impacts

- Creation of employment and job security with economic spin-offs.
- Provision of diamonds for local and international markets.
- Access road upgrading.
- Reduction in development footprint by placing processing plant infrastructure in historical mining excavation.
- Rehabilitation mining excavation areas to enable the development of a solar farm after mining has closed.

9.5.2 Negative impacts

The key potential negative impacts associated with the prospective activity include the following:

- Site access:
  - Disturbance of onsite fauna and flora.
  - Soil compaction from repeated use of access tracks.
- Site Establishment Activities (topsoil stripping and stockpiling, placement of logistics, waste generation and management)
  - Visual intrusion.
  - Emissions (dust, vehicle, and noise) from topsoil stripping; vehicles and machinery.
  - Wildlife and vegetation disturbance from site preparation.
  - Contamination and disturbance of topsoil and soil from compaction, including soil disturbance due to topsoil stockpiling.
  - Waste generation.
  - Water use for dust suppression during site establishment.
- Mining and processing activities:
  - Noise is caused by the machinery and vehicles on-site, and by vehicles on haul roads.
  - Visibility of the mining operations.
  - Dust emissions from general site activities (vehicle entrained dust).
  - Disturbance of biodiversity from vehicles.
  - Water use for processing to be extracted from the two boreholes.
  - Contamination of soil from hydrocarbon spills and compaction on access tracks.
  - Contamination of groundwater through unmanaged use of machinery.
  - Contamination of surface water resources with the need to separate dirty water from clean water systems on the mine site.
  - Storage and use of hazardous chemicals in processing.
  - Disposal of sewage from logistics in an on-site Biozone type facility that is containerised. Effluent will be taken off-site and disposed of at the municipal sewage works.

- The specialist heritage resources impact assessment report as well as the paleontological impact assessment (Appendix E, page 176)was prepared for the EIA Phase and will be submitted to the South African Heritage Resources Agency (SAHRA) during the 30-day public participation comment period. Any additional recommendations and/or mitigation measures stipulated by SAHRA will be included in the Final EIA Report.
- The proposed location of the processing area including the tailings disposal has been identified based on the existing prospecting and bulk sampling operations.
- Unauthorised access leading to injury in areas of excavation and tailings.

- Rehabilitation of the mining area, scarifying compacted areas and vehicle tracks:
  - Dust emission from decommissioning activities (vehicle entrained dust).
  - Soil erosion of topsoil.

9.6 The possible mitigation measures that could be applied

Refer to **Table 13** on **page 78** for the potential mitigation measures included under each impact.

9.7 The outcome of the Site Selection Matrix & Final Site Layout Plan

Refer to **Figure 4 (page 8)** & **Figure 5 (page 9)** for the overall mining right area, presented for comment as part of the Scoping Phase stakeholder engagement process.

9.8 Motivation where no alternative sites were considered

Alternatives have been considered for this project, as described in Section 6 above. Where alternatives are not likely to be considered in the Impact Assessment Phase, reasons have been provided in Section 6 above.

9.9 Statement Motivating the Preferred Sites

Refer to Section 6 above. The project site has been selected based on the results from bulk sampling and mining. The layout of the associated infrastructure is based on the existing location of these various components. The mining Target Areas have been determined by the shape, position and orientation of the mineral resource expected to be found based on bulk sampling and mining, as shown in **Figure 5 (page 9)**.

In summary, therefore:

- The **Preferred Alternative** is the mining of diamonds, as per the Mine Plan Target Areas shown in **Figure 5 (page 9)**.
- The preferred and only **location** alternative of the mining activity is as per **Figure 5 (page 9)**, which indicates the Target Areas, and the location of the existing infrastructure and logistics as shown in **Figure 3 (page 4)**. The existing access roads will be utilised and sections upgraded or new routes developed as required. No electricity powerline connections are required.
- The preferred and only **activity** alternative is the mining of diamonds based on the mineral resources investigated during previous mining in the target area localities shown in **Figure 5 (page 9)**.
- The preferred **technology** alternative is the use of the crushing tools, grizzlies, feed bins, conveyor systems and screens to be custom-built for the fragmentation phase of the upgraded processing plant. Electricity is supplied by Eskom, with diesel generators for the borehole pumps, as described in Section 6.5 above.
- The preferred **operational** alternative involves the mining taking place as a continuation of the current bulk sampling surface mining and entails:
  - Removal of overburden above the diamond-bearing gravels by an excavator to expose the diamondiferous gravels which overlie the bedrock;
  - Removal of the diamondiferous gravels which will be sent to the plant for processing and diamond recovery; and,
  - Sweeping of the paleo bedrock floor by hand to recover pothole gravels for processing.
  - Indicated resources will be mined together with the proven reserves and the inferred resources will be investigated as a last option for mining.

The operational approach is practical and based on best practices to ensure a phased approach of mining followed by rehabilitation in sequential stages. Different processing manners will be applied as applicable to the target areas.

There are therefore no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory "no-go" alternative that must be assessed for comparison purposes.

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

Refer to the Impact Assessment Methodology detailed in Section 9.4 above and employed in the rating of impacts detailed in the Impact Tables attached at **Appendix F, page 259**.

Refer to Section 9.5 above and **Table 13** below, which references the findings from **Appendix F, page 259** and the measures to avoid, reverse, mitigate or manage the identified impacts to determine the extent of the residual risks that need to be managed and monitored.

Table 13: Potential Residual Risk Pre-& Post-Mitigation for the Preferred & Only Alternative

NAME OF ACTIVITY	PHASE In which impact is anticipated	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
POST-APPROVAL ACTIVITIES						
Access to be discussed with the landowner regarding roads and gates	Planning and design	• Loss of vegetation and associated biodiversity	• Biodiversity • Community assets	Low (-)	• Unnecessary destruction of vegetation is avoided by ensuring that traffic and personnel movement is restricted to demarcated areas. No traffic should be allowed in the rehabilitated areas. • Ensure all gates are kept closed and locked as required by the landowner.	• Low (-)
Demarcate target areas for mining		• Non-compliance	• Legal compliance	High (-)	• Ensure that mining activities are contained within approved boundaries.	• Low (-)
SITE ACCESS & SITE ESTABLISHMENT ACTIVITIES						
Conduct Environmental Induction training of staff	Construction	• Poor management of environmental impacts	General environmental management	• Medium (-)	• Hydrocarbon and waste management • Dust control • Traffic safety	• Low (-)
Upgrading of existing access roads, if necessary	Construction	• Soil compaction • Dust generation • Traffic increase • Waste generation • Stormwater control • Altering the characteristics of a watercourse. • Material stockpiling	• Land capability • Air quality • Community safety • Ground and water pollution • Water resources • Visual landscape	• Low (-) • Medium (-) • Medium (-) • Low (-) • Medium (-) • Low (-)	• Minimise compaction • Dust reduction • Traffic safety • Hydrocarbon and waste management • Water resource management • Construction site management	• Low (-) • Low (-) • Low (-) • Low (-) • Low (-) • Low (-)
Constructing new access roads	Construction	• Soil Erosion • Loss of biodiversity • Emissions (dust, vehicles & noise) • Traffic increase	• Land capability • Biodiversity • Air quality • Community safety • Change in topography	• Medium (-) • Medium (-) • Medium (-) • Medium (-) • Medium (-) • Medium (-) (water)	• Topsoil management • Demarcate areas for development footprints • Dust reduction • Traffic management • Height of stockpiles • Water resource management	• Low (-) • Low (-) • Low (-) • Low (-) • Low (-) • Low (-) • Low (-)
Maintenance of diesel generator at boreholes	Construction					
Maintenance or replacement of above-ground	Construction					

NAME OF ACTIVITY	PHASE In which impact is anticipated	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
pipelines to boreholes, and diesel pumps.		• Topsoil and overburden removal and stockpiling • Stormwater run-off and altering the characteristics of a watercourse and impeding flow. • Hydrocarbon & waste management • Material stockpiling • Mobile ablution facilities • Job creation	• Water quality and water resources • Biodiversity and visual landscape • Visual landscape • Socio-economic spin-offs (+)	• Medium (-) • Medium (-) • Medium (-) [no jobs & no local spinoffs]	• Hydrocarbon and waste management, and mobile ablution facilities • Construction site management and housekeeping • Job creation (+) & local economic spin-offs (+)	• Low (-) • Medium (+)
Prepare areas for development footprints as per **Figure 5**, page 9.	Construction					
OPERATIONAL PHASE ACTIVITIES						
Processing activities, including tailings disposal in excavations.	Operational	• Management of emissions (dust & noise) • Water use • Light Pollution • Water resource pollution (groundwater) • Water resource disturbance (surface water) • Waste management • Visual impact	• Land capability • Emissions • Water resources (surface water features and groundwater) • Waste generation • Air quality • Visual landscape • Social upliftment and economic spin-offs	• Medium (-) • Medium (-) • Medium (-) (surface water features and groundwater) • Medium (-) • Medium (-) • Medium (-) • Medium (-) (employment and spin-offs)	• Mine Health and Safety Regulations and Dust Control Regulations in terms of NEM: AQA. Management of activities to weekdays only, and during the daytime, not at night. • Water management: DWS Best Practice Guidelines for Stormwater Management • Water surface water features: buffer identification, and avoidance, and/or application for Section 21(c) and (i) WULA • Hydrocarbon and waste management • Tailings storage in the excavated area, including risk classification in EIA Phase.	• Low (-) (dust) • Low (-) (noise) • Low (-) (surface water features & groundwater) • Low (-) (visual) • Medium (+) (employment and spin-offs)

NAME OF ACTIVITY	PHASE In which impact is anticipated	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
		• Hazardous materials (hydrocarbons) storage and usage • Job creation and economic spin-offs			• Visual Screening where possible for above-ground workings. • Employment creation.	
Transporting materials (ROM ore to a Processing facility)	Operational	• Management of emissions (dust, and noise) • Waste generation • Access roads compaction and erosion • Traffic increase • Job creation	• Air quality • Waste management • Community safety • Social upliftment and economic spin-offs	• Medium (-) • Medium (-) • Medium (-) • Medium (-)	• Dust and emissions control • Hydrocarbon and waste management • Traffic safety control • employment created	• Low (-) • Low (-) • Low (-) • Medium (+)
Use of all facilities and amenities associated with mine logistics	Operational	• Management of emissions (dust, noise & light) • Water usage and pollution • Waste and effluent generation • Access roads compaction and erosion	• Air quality • Visual landscape • Waste management • Soil erosion and stormwater control	• Medium (-) • Medium (-) • Medium (-)	• Dust and emissions control • Water management: Integrated Water and Wastewater Management Plan (IWWMP) if applicable, (a component of iWULA) and DWS Best Practice Guidelines for Stormwater Management • Hydrocarbon and waste management	• Low (-) • Low (-) • Low (-)
DECOMMISSIONING PHASE ACTIVITIES						
Fill in the excavation with topsoil and sand removed before the excavation.	Decommissioning Rehabilitation	• Topography • Visual • Vegetation re-establishment	• Land capability • Landscape • Biodiversity	• Medium (-) • Medium (-) • Medium (-)	• Rehabilitation according to Rehabilitation, Decommissioning and Closure Plan to be included in EIA Phase	Very low (-)
Rip all hardened areas and remove all structures	Decommissioning Rehabilitation				• Allow revegetating naturally	Very low (-)

10 SUMMARY OF SPECIALIST REPORTS

Table 14: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
Heritage Impact Assessment	A Heritage Impact Assessment Report was prepared by ASHA Consulting (Pty) Ltd. (attached as **Appendix E, 23.1 Heritage Impact Assessment, page 176**), ***"It is recommended that the mining right application be supported and that authorisation for the mining as proposed should be granted. The following recommendations must be included in the conditions of authorisation:*** • *The fossil find procedures must be incorporated into the **EMPr** and applied whenever fossil finds are made. This includes the reporting of all finds to a palaeontologist;* • *The identified significant archaeological sites and their buffers must be included on mine maps and if any are to be disturbed for any reason then archaeological mitigation must be effected (under a permit issued by SAHRA) and approved by SAHRA prior to commencement of mining work;* • *The historic copper mining complex and grave site should be avoided altogether (see Grade IIIA sites on Figure 50 of the HIA); and* • *If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution."* (Referenced from Section 10 in **Appendix E, 23.1 Heritage Impact Assessment, page 176**).	**X** All of the recommendations included in the column to the left have been included in this report.	Section 8.1.2 **Appendix E, 23.1 Heritage Impact Assessment, page 176** PART B: **EMPr**, **page 96** **Table 18** Impact Tables (**Appendix F, page 259**) Final Rehabilitation, Decommissioning and Mine Closure Plan **(Appendix G, page 293**)

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
A palaeontological impact assessment was commissioned by the HIA specialist and provided by John Pether, a Geological and Palaeontological Consultant.	A **palaeontological impact assessment** of the area was undertaken by John Pether, Geological and Palaeontological Consultant to determine the palaeontological sensitivities of the affected areas (see **Appendix E, 23.2 Paleontological Impact Assessment, page 227**). **The following recommendations are made** *"Open-pit mine excavations are a scientific and fossil resource and have been the major contributor to the understanding of the deposits and palaeontology of the Namaqualand coastal plain. Mine personnel have played a critical role in bringing fossil finds to the attention of the international scientific community. However, these have generally been the rare, visually-obvious large finds of many bones. Scattered finds and small fossils sparsely distributed in the deposits are generally missed or overlooked, as has probably been the case for the Buffelsrivier fluvial deposits. Indeed, most coastal diamond mine exposures also do seem to lack fossils, but these are discovered during the few occasions when mine geologists and guest scientists doing research projects have undertaken systematic, close-range scrutiny of the pit walls, which is not a routine mining activity.* *The sampling and mining on Wolfberg 187 could have a positive impact with respect to understanding the stratigraphy and to palaeontological heritage, providing that adequate mitigation measures are in place and duly performed over the duration of the mining.* *As it is impractical for a specialist to routinely monitor the mine pit and mined material, routine monitoring can only be achieved by the co-operation of the people on the ground. By these are meant personnel in supervisory/inspection roles, such as the pit foremen, geologist, surveyor and environmental monitoring officer, who are willing and interested to look out for occurrences of fossils. A monitoring presence is critical for spotting fossils as they are uncovered and stopping further damaging excavation.*	**X** All of the recommendations included in the column to the left have been included in this report.	Section 8.1.2 **Appendix E2, 23.2 Paleontological Impact Assessment, page 227** PART B: **EMPr**, **page 96** **Table 18** Impact Tables (**Appendix F, 259**) Final Rehabilitation, Decommissioning and Mine Closure Plan **(Appendix G, page 293**)

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
	It is recommended that a requirement to be alert for fossil materials and archaeological material be included in the Environmental Management Plan (EMP) for the sampling, mining and rehabilitation operations. The Environmental Control Officer (ECO) and mining supervisor must inform staff of the need to watch for potential fossil occurrences. *Based on the lack of fossil finds hitherto, and personal observations, a major concentration of fossil bones is not expected. Nevertheless, in case of a chance discovery of fossil bone material, both in new excavations and in the disturbed materials, a Fossil Finds Procedure" (FFP) is provided in Appendix 2* (of the PIA). *It is expected that such finds would be in the category of "allowed" rescue by mine staff, i.e. as for isolated bone finds in the FFP.* *As mentioned above, finds of petrified teeth in concentrates hold the most promise for a diagnostic fossil find from the Buffelsrivier deposits. Importantly, the previous finds have come from small-scale, "hands-on" operations using rotary pans and Pleitz jigs to concentrate heavy minerals, such as the proposed operations by Kasimira. Whereas, in the large mine, high-throughput concentration systems using Heavy Media Separation (HMS) plants and X-ray Sortex-type machines to extract diamonds in a "hands off" security regime, the petrified fossils in the concentrate are not captured.* *It is highly recommended that mine staff must be empowered to rescue the petrified fossil material that is retained in the rotary pan concentrates and which is seen during their sorting."* (Referenced from Section 10 in **Appendix E2, 23.2 Paleontological Impact Assessment, page 227**).		

11 ENVIRONMENTAL IMPACT STATEMENT

11.1 Summary of the key findings of the environmental impact assessment

The significance ratings of impacts after mitigation on the key aspects of the "preferred alternative" and the "no go" alternative are shown per phase in the following tables.

Table 15: Significance Ratings of Impacts after Mitigation during Construction Phase

IMPACTS AND ASPECTS	PREFERRED AND ONLY ALTERNATIVE - RISKS	NO-GO ALTERNATIVE
1. SOIL EROSION AND COMPACTION: The clearing of additional areas for new waste dumps, tailings and extensions, including for logistics will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall. Soil compaction will result from ongoing repeated use of access tracks.	**Low**	**NO IMPACT**
2. WATER RESOURCES (QUALITY & QUANTITY): Water is obtained from boreholes present in the mining area and stored in a 45 000-litre reservoir. Supply lines from the reservoir to the logistical facilities and plant needs to be upgraded and underground pipelines demarcated. This storage will also provide an emergency supply for the fire hydrants. The Buffels River and tributary are located on the southern border of the farm.	**Low**	**NO IMPACT**
3. LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AREA The site is mostly classified as a Critical Biodiversity Area (CBA1 and CBA2) and a small section is classified as an Ecological Support Area (ESA). A section on the south eastern area of the farm is classified as a River FEPA. The entire site has minimal vegetation cover as it has been disturbed by previous prospecting and mining activities.	**Low**	**NO IMPACT**
4. POTENTIAL FOR SOIL CONTAMINATION AND WASTE MANAGEMENT DURING CONSTRUCTION PHASE Spillage of oils, wastewater, refuge and other waste generated by construction activities.	**Low**	**NO IMPACT**
5. VISUAL INTRUSION: Caused by machinery, topsoil stockpiles, cleared areas, and movement of trucks on-site during the preparation of site establishment.	**Low**	**NO IMPACT**
6. **EMISSIONS (DUST, VEHICLES & NOISE):** Noise and dust will be created by mining equipment (e.g., front-end loaders) and vehicles, which will emit Greenhouse Gases.	**Very low**	**NO IMPACT**
7. ARCHAEOLOGICAL RESOURCES AND GRAVES Direct impacts to archaeological resources might occur during all phases of development, but especially during construction and topsoil removal (e.g., vehicles could drive over archaeological sites).	**Low**	**NO IMPACT**
8. PALAEONTOLOGICAL IMPACTS Destruction of or damage to fossil bones or resources by mining.	**Very low**	**NO IMPACT**
9. SOCIO-ECONOMIC IMPACTS Creation of employment & job security with local and regional economic spin-offs	**Medium (+)**	**NO IMPACT**

Table 16: Significance Ratings of Impacts after Mitigation during Operational Phase

IMPACTS AND ASPECTS	PREFERRED AND ONLY ALTERNATIVE - RISKS	NO-GO ALTERNATIVE
1. CHANGE IN TOPOGRAPHY: The change in topography from mining activities would be slight depressions created in the landscape. These depressions would be minimal as only 1%-5% is taken for final recovery. The tailings are returned to the excavated areas for backfilling.	**Low**	**NO IMPACT**
2. SOIL EROSION & SOIL COMPACTION: The potential for soil erosion by wind and stormwater run-off; soil compaction from repeated use of access tracks.	**Low**	**NO IMPACT**
3. WATER RESOURCES (QUALITY & QUANTITY): Water is obtained from boreholes present in the mining area and stored in a 45 000-litre reservoir. Supply lines from the reservoir to the logistical facilities and plant needs to be upgraded and underground pipelines demarcated. This storage will also provide an emergency supply for the fire hydrants. The Buffels River and tributary are located on the southern border of the farm.	**Low**	**NO IMPACT**
4. LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING NATURAL AND/OR PREVIOUSLY DISTURBED AREAS: The proposed mining area footprint will result in an impact on localised ecological functioning, although limited as bulk sampling, has already occurred in some places; the tailings storage facility will be situated in historically excavated areas, where possible; access and haul roads exist; and the site camp area will also be on a disturbed area. Transport of materials will be along existing access tracks resulting in little impact on ecological functioning at a local level during the operation phase. The machinery and trucks will continue to disturb local fauna, already accustomed to the existing mining activities. The site is mostly classified as a Critical Biodiversity Area (CBA1 and CBA2) and a small section is classified as an Ecological Support Area (ESA). A section on the south eastern area of the farm is classified as a River FEPA. The entire site has minimal vegetation cover as it has been disturbed by previous prospecting and mining activities.	**Low**	**NO IMPACT**
5. POTENTIAL FOR SOIL CONTAMINATION, AND WASTE MANAGEMENT DURING OPERATIONAL PHASE: Tailings are to be collected in the tailings storage facility located in the existing excavations; overburden; industrial waste (hazardous wastes, oil & grease); and domestic waste	**Low**	**NO IMPACT**
6. VISUAL INTRUSION: Caused by the machinery, topsoil and overburden stockpiles, cleared areas, and movement of trucks on site.	**Very Low**	**NO IMPACT**
7. EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by the mining and processing activities; from the mining equipment (e.g., front-end loaders) and hauling vehicles that also emit Greenhouse Gases.	**Low**	**NO IMPACT**
8. ARCHAEOLOGICAL RESOURCES AND GRAVES Direct impacts to archaeological resources might occur during all phases of development (e.g., vehicles could drive over archaeological sites).	**Low**	**NO IMPACT**

IMPACTS AND ASPECTS	PREFERRED AND ONLY ALTERNATIVE - RISKS	NO-GO ALTERNATIVE
9. PALAEONTOLOGICAL IMPACTS Destruction of or damage to fossil bones or resources by sampling and mining.	**Very low**	**NO IMPACT**
10. SOCIO-ECONOMIC IMPACTS Creation of employment & job security with local and regional economic spin-offs	**Medium (+)**	**Medium (-)**

All of the negative identified impacts will occur for a limited period and the extent of the negative impacts will be localised. All of the identified impacts can be suitably mitigated. There is a correlation between cumulative impacts post-mitigation, and the significance rating of impacts after mitigation as indicated in **Appendix F, page 259.**

11.2 Final Site Map

Refer to **Figure 1 (page 2), Figure 2 (page 3)** and **Figure 3 (page 4)** above for the location of the mining areas that comprise this Mining Right Application.

11.3 Summary of the positive and negative implications and risks of the proposed activity and identified alternatives

Refer to Section 11.1 above, and **Table 15** and **Table 16**.

11.4 Proposed Impact Management Objectives and the impact management outcomes for inclusion in the EMPr

11.4.1 Management Objectives

The proposed impact management objectives are listed below:

- Objective 1 - To create a safe and rehabilitated post-mining environment.
  - Ensure a safe mining area with no potentially dangerous areas like deep excavations and unauthorised access.
  - Topsoil to be stockpiled and replaced during decommissioning and closure, and rehabilitation.
- Objective 2 - To minimise pollution or degradation of the environment
  - Provide sufficient information and guidance to plan the diamond mining activities in a manner that would reduce impacts as far as practically possible.
  - Limit residual environmental impact on surface water, groundwater, coastal areas and ocean, the salt pan and soil by ensuring that no fuel or oil spills occur in the mining area causing contamination.
  - Access potable water in a sustainable manner from the boreholes.
  - Access and use of borehole water in a sustainable manner and discarding of water and waste as per approved methodology.
  - Ensure that no solid waste or rubble is dumped on the site.
  - Ensure that portable toilets are used in places far from the logistics area, and at the Site Camp. A Biozone System will be put in place for the greywater, and greywater shall be recycled for mining use where possible.
- Objective 3 – To minimise impacts on the community and to provide optimal post-mining social opportunities
  - Ensure that workers remain within the mining right area.
  - Operate during normal working hours only.
  - Minimise the generation of noise and dust.
  - Respond rapidly to any complaints received.
  - Minimal negative aesthetic impact.
  - Optimised benefits for the social environment.

11.4.2 Outcomes

- By providing sufficient information to strategically plan the mining activities, unnecessary social and environmental impacts be avoided.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation.
- Through the implementation of the proposed mitigation measures, it is anticipated that the identified social and environmental impacts can be managed and mitigated effectively.
- Noise generation can be managed through consultation and restriction of operating hours and by maintaining equipment and applying noise abatement equipment if necessary.
- Visual intrusion can be managed through natural vegetation or shade cloth, etc.
- Dustfall can be managed by reducing driving speeds when driving on unpaved roads.
- Wildlife disturbance and clearance of vegetation will be limited to the absolute minimum required and disturbed areas will be re-vegetated with locally indigenous species as soon as possible.
- Surface water and groundwater contamination by hydrocarbons can be managed by conducting proper vehicle maintenance, refuelling with care to minimise the chance of spillages and by having a spill kit available on each site.
- Impacts to the river/watercourses can be managed by limiting mining areas to the minimal required area.

11.5 Final Proposed Alternatives

Refer to Section 6.

11.6 Aspects for inclusion as conditions of the authorisation

- All mining and rehabilitation are to be conducted as per the approved **EMPr, page 96**, and **Rehabilitation, Decommissioning and Closure Plan** (**Appendix G, page 293**).
- Concurrent mining and rehabilitation must be undertaken in the designated mining blocks.
- The proposed mining area must be clearly demarcated with semi-permanent markers.
- The upper 50cm of soil must be removed and stockpiled to be returned after mining by spreading evenly over impacted areas.
- Eradicate all alien vegetation in the area during and regularly after mining.
- The Applicant must appoint a suitably qualified ECO who will be responsible for ensuring compliance with the requirements of the **EMPr** during the mining operation and decommissioning.
    - The ECO must:
        - Inspect the site and record compliance with the **EMPr**;
        - Inform key, on-site staff of their roles and responsibilities in terms of the **EMPr**;
        - Ensure that all activities on site are undertaken in accordance with the **EMPr**;
        - Immediately notify the mining operator of any non-compliance with the **EMPr** or any other issues of environmental concern.

The following recommendations are referenced from the Heritage Impact Assessment (Appendix E1), page 176:

- *The fossil find procedures must be incorporated into the EMPr and applied whenever fossil finds are made. This includes the reporting of all finds to a palaeontologist.*
- *The identified significant archaeological sites and their buffers must be included on mine maps and if any are to be disturbed for any reason then archaeological mitigation must be effected (under a permit issued by SAHRA) and approved by SAHRA prior to commencement of mining work;*
- *The historic copper mining complex and grave site should be avoided altogether (see Grade IIIA sites on Figure 50* in the HIA*); and*
- *If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.*

- A chance finds procedure for the protection and reporting of fossils needs to be in place. Fossils should be reported to SAHRA (phone 021 462 4502) and/or a palaeontologist.
- A chance finds procedure for the protection and reporting of human remains needs to be in place. Archaeological human remains should be reported to SAHRA (phone 021 462 4502) and/or an archaeologist.

The following recommendations are made in the Paleontological Impact Assessment (Appendix E2), page 227):

- *Open-pit mine excavations are a scientific and fossil resource and have been the major contributor to the understanding of the deposits and palaeontology of the Namaqualand coastal plain. Mine personnel have played a critical role in bringing fossil finds to the attention of the international scientific community. However, these have generally been the rare, visually-obvious large finds of many bones. Scattered finds and small fossils sparsely distributed in the deposits are generally missed or overlooked, as has probably been the case for the Buffelsrivier fluvial deposits. Indeed, most coastal diamond mine exposures also do seem to lack fossils, but these are discovered during the few occasions when mine geologists and guest scientists doing research projects have undertaken systematic, close-range scrutiny of the pit walls, which is not a routine mining activity.*
- *The sampling and mining on Wolfberg 187 could have a positive impact with respect to understanding the stratigraphy and to palaeontological heritage, providing that adequate mitigation measures are in place and duly performed over the duration of the mining.*
- *As it is impractical for a specialist to routinely monitor the mine pit and mined material, routine monitoring can only be achieved by the co-operation of the people on the ground. By these are meant personnel in supervisory/inspection roles, such as the pit foremen, geologist, surveyor and environmental monitoring officer, who are willing and interested to look out for occurrences of fossils. A monitoring presence is critical for spotting fossils as they are uncovered and stopping further damaging excavation.*
- *It is recommended that a requirement to be alert for fossil materials and archaeological material be included in the Environmental Management Plan (EMP) for the sampling, mining and rehabilitation operations. The Environmental Control Officer (ECO) and mining supervisor must inform staff of the need to watch for potential fossil occurrences.*
- *Based on the lack of fossil finds hitherto, and personal observations, a major concentration of fossil bones is not expected. Nevertheless, in case of a chance discovery of fossil bone material, both in new excavations and in the disturbed materials, a Fossil Finds Procedure" (FFP) is provided in Appendix 2* (of the PIA). *It is expected that such finds would be in the category of "allowed" rescue by mine staff, i.e. as for isolated bone finds in the FFP.*
- *As mentioned above, finds of petrified teeth in concentrates hold the most promise for a diagnostic fossil find from the Buffelsrivier deposits. Importantly, the previous finds have come from small-scale, "hands-on" operations using rotary pans and Pleitz jigs to concentrate heavy minerals, such as the proposed operations by Kasimira. Whereas, in the large mine, high-throughput concentration systems using Heavy Media Separation (HMS) plants and X-ray Sortex-type machines to extract diamonds in a "hands off" security regime, the petrified fossils in the concentrate are not captured.*
- *It is highly recommended that mine staff must be empowered to rescue the petrified fossil material that is retained in the rotary pan concentrates and which is seen during their sorting.*

11.7 Descriptions of any Assumptions, Uncertainties & Gaps in Knowledge

- The desk-top research included reference to the SANBI BGIS database map viewer for the various baseline environmental attributes, and any assumptions or gaps in knowledge expressed by SANBI in the provision of this information would apply to this information as a reference.
- It is assumed that the proposed mitigation measures as listed in this report and included in the **EMPr (page 96)** will be implemented and adhered to. Mitigation measures are proposed which are considered reasonable and must be implemented for the outcome of the assessment to be accurate.
- It is assumed that the **Rehabilitation, Decommissioning and Closure Plan (Appendix G, page 293**) and any annual Rehabilitation Plans as part of the production, will be implemented and adhered to.

- Water Use Licenses **(Appendix D, page 161)** have been issued by the Department of Water Affairs (DWA) it is assumed that all the conditions of the WULA will be implemented by the Applicant as determined by DWA.

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

11.8.1 Reasons why the activity should be authorized or not

It is the opinion of the EAP that the proposed mining right activity should be authorised. In reaching this conclusion the EAP has considered that:

- The "preferred alternative" takes into account location alternatives, activity alternatives, layout alternatives, technology alternatives and operational alternatives.
- The approach taken is that it is preferable to avoid significant negative environmental impacts, wherever possible. There are no significant environmental impacts associated with the proposed activity.
- Although the site is located on areas classified as Critical Biodiversity Area or Ecological Support Area, the site has been highly disturbed by previous prospecting, bulk sampling and mining activities and very little vegetation remains on site. It is the opinion of the EAP that the underlying biodiversity objectives and ecological functioning will not be compromised, subject to the strict adherence to the **EMPr** (**section 15, page 96**) and Rehabilitation, Decommissioning and Closure Plan (**Appendix G, page 293**).
- The activity has been assessed to have a positive socio-economic impact, especially in terms of the creation of employment and the provision of diamonds for the local and international markets.
- Provided the recommended mitigation measures are implemented in an environmentally sound manner and mining activities are managed in accordance with the stipulations of the **EMPr**, and Rehabilitation, Decommissioning and Closure Plan (**Appendix G, page 293**), the potential negative impacts associated with the implementation of the preferred alternative can be reduced to acceptable levels.

11.9 Conditions that must be included in the authorization

11.9.1 Specific conditions to be included in the compilation and approval of EMPr

As per section 11.6 above:

- All mining and rehabilitation are to be conducted as per the approved **EMPr**, and Rehabilitation, Decommissioning and Closure Plan (**Appendix G, page 293**).
- Concurrent mining and rehabilitation must be undertaken in the designated mining areas.
- Wastewater and tailings will be collected in a tailings dam from where the water will be re-used, if possible.
- Solid waste shall be dumped in the Municipal landfill regularly.
- The mining operator must appoint a suitably qualified ECO who will be responsible for ensuring compliance with the requirements of the **EMPr** during the mining operation and decommissioning.
    - The ECO must:
        - Inspect the site and record compliance with the **EMPr**;
        - Inform key, on-site staff of their roles and responsibilities in terms of the **EMPr**;
        - Ensure that all activities on site are undertaken in accordance with the **EMPr**;
        - Immediately notify the mine operator of any non-compliance with the **EMPr** or any other issues of environmental concern.
- Should any burials, fossils or other historical material be encountered during construction, work must cease immediately and SAHRA must be contacted.
- The mine operation must follow an Integrated Waste Management approach. Control measures must be implemented to prevent pollution of any water resource or soil surface by oil, grease, fuel or chemicals. Appropriate pollution prevention measures must be implemented to prevent dust.
- A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers will be informed of the speed limit applicable to the length of the access road, where after the national

speed limits will be applicable for hauling trucks. The access road will be maintained during operational activities.

11.9.2 Rehabilitation requirements

- After excavations are no longer processed, it should be backfilled immediately for security and safety reasons before the project is moved to the mining position. In case of the sudden closure of the project, there will be only a few excavations to be dealt with as part of final decommissioning and rehabilitation.
- At final closure, the floor of the excavation needs to be levelled and the sides sloped to create an even depression.

11.10 Period for which the environmental authorisation is required

The authorisation is required for the duration of the Mining Right, which is a period of 30 years.

11.11 Undertaking

It is confirmed that the undertaking required to meet the requirements of this section is provided at the end of this report.

12 FINANCIAL PROVISION

12.1 Introduction

With the repeal of Section 41 of the MPRDA (Act 28 of 2002) that requires that the owner of a mine must make financial provision for the remediation of environmental damage, regulations pertaining to the financial provision for mining, exploration, prospecting or production operations under section 44, read with sections 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) were issued in 2015.

According to regulation 7, the applicant or holder of a right or permit must ensure that the financial provision is, at any given time, equal to the sum of the actual costs of implementing the plans and report contemplated in regulation 6 and regulation 11(1). In terms of regulation 11(1) the holder of a right or permit must ensure that a review is undertaken of the requirements for:

(a) annual rehabilitation, as reflected in an annual Rehabilitation Plan;
(b) rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations as reflected in a Final Rehabilitation, Decommissioning and Mine Closure Plan; and,
(c) remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

The assessment of the financial provision requirements for annual rehabilitation in terms of reg. 6(a) is provided as part of the annual Rehabilitation Plan that forms part of the annual Environmental Audit of the implementation of the Environmental Authorisation and Final Rehabilitation, Decommissioning and Mine Closure Plan in terms of the NEMA EIA regulations (2014).

Financial provision in terms of reg. 6(c) are covered by the requirements for the actual costs of implementation of the measures required for final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations as reflected in the Final Rehabilitation, Decommissioning and Mine Closure Plan in terms of reg. 6(b), attached as **Appendix G, page 293**.

The calculations are included in Final Rehabilitation, Decommissioning and Mine Closure Plan attached as Appendix G, page 171.

12.2 Explain how the aforesaid amount was derived

The following risk-based criteria and assumptions were used to calculate the final rehabilitation, decommissioning and closure cost of the active mining area:

- FRD's will be created within any one of the existing excavations.
- No new overburden, coarse tailings or oversize dumps will be created as part of this operation.
- The general approach adopted for excavations is to reinstate the original profile of the landscape and ensuring the hydrological integrity of the area. Topography to follow the original landform shape.
- The excavations will be filled in with overburden, the top 150 mm being topsoil
- Where topsoil is not available, the cost for in-situ remediation will be the same as the estimate for top soiling
- The post-mining topography at the excavations will be adjusted where possible to minimise the effect on water flow and increase the potential for re-vegetation.
- Ensure that water used in any process at a mine or activity is recycled as far as practicable, and any facility, sump, pumping installation, catchments dam or other impoundment used for recycling water, is of adequate design and capacity to prevent the spillage, seepage or release of water containing waste at any time.

The following risk-based criteria and assumptions were used to calculate the final rehabilitation, decommissioning and closure cost of the infrastructure and processing area:

- Removal of all structures and infrastructure not developed as part of farm improvement
- Remove all assets, all vehicles, plant and workshop equipment will be removed for salvage or resale
- All fixed assets that can be profitably removed will be removed for salvage or resale
- Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in cost estimation) and the remaining treated as waste and removed from the site
- All structures will be demolished and terracing and foundations removed to the lesser of 500 mm below the original ground level
- Inert waste, which is more than 500 mm underground, such as pipes, will be left in place
- A hazardous disposal site will not be constructed and all hazardous waste will be removed from the site and transported to the nearest licensed facility as part of the housekeeping
- All services related to the operation, water supply lines and storage on-site will have to be demolished
- All compacted areas due to hauling and stockpiling must be ripped to 300 mm
- The compacted salvage yard lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled.
- All disturbed and exposed surfaces will be prepared to facilitate natural revegetation
- Existing tracks will be used and new tracks must be restricted to the absolute minimum.
- Disturbed land will be used for the development of processing areas and all FRD's to be developed within existing excavations
- Rotary plant to be moved according to the blocks to be explored and infield screening to be done at excavations to reduce the volume of material to be hauled to the processing plant
- No new tailings or waste rock dumps will be created above the surface as part of this operation
- Return of land to its pre-mining land capability where possible
- Haul roads will be developed in relation to the bulk sample sites by following the shortest route from existing tracks.
- The tailings and waste rock dumps at the processing plant will not exceed the planned area footprint (200m^3) and must be hauled back to excavations regularly

12.3 Confirm that this amount can be provided for from operating expenditure

The amount needed for the implementation of the Rehabilitation, Decommissioning and Closure Plan will be provided to DMR in the form of a bank guarantee and the plan will be revised on an annual basis in terms of regulation 11(1) of the NEMA Financial Regulations 2015.

Provision for implementation of the annual Rehabilitation Plan is to be provided as part of the environmental audit report in terms of Regulation 34 (1) (b) of the NEMA EIA Regulations (2014) and will be provided as part of the operational budget. Proof of access to the necessary fund will be provided as part of the Mining Works Plan (MWP) together with proof of access to the necessary financial resources.

13 DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY

13.1 Deviations from the methodology used in determining the significance of potential environmental impacts and risks

No biodiversity statement was completed for this application as the site has been highly disturbed previously by prospecting, bulk sampling and mining activities.

13.2 Motivation for the deviation

The biodiversity specialist was unable to meet the stipulated deadline despite taking a period of 3 months, which included waiting for the rainfall season to commence. The specialist comment is therefore not included in this DEIAR.

14 Other Information required by the competent Authority

14.1 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

Potential socio-economic impacts are addressed by the specialists who prepared the **Social and Labour Plan**, (attached in **Appendix H**, page 354) due to the nature of the process involved. High-level socio-economic impacts and mitigation measures are included in **Table 16**.

Potential socio-economic impacts have been addressed in Sections **8** & **11**. High-level socio-economic impacts and mitigation measures are included in **Table 16**.

A full consultation process is being implemented during the environmental authorisation process. The purpose of the consultation is to provide affected and interested persons with the opportunity to raise any potential concerns. Comments received or concerns raised in the scoping process was addressed as part of the Final SR and the comments received as part of the DEIAR are included in Section **6** and **Appendix B**, page 127.

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

A Specialist Heritage Impact Assessment and Palaeontological Impact Assessment (attached at **Appendix E, page 176**) have been prepared. Both reports will be submitted to the South African Heritage Resources Agency (SAHRA) during the 30-day public participation comment period. Recommendations and conclusions from **Appendix E** are included in Section 10, page 81 above, and any additional measures stipulated by SAHRA will be included in the Final EIA Report, **EMPr** (Part B) on page 96, Impact Table (**Appendix F, page 259**) and Final Rehabilitation, Decommissioning and Mine Closure Plan (**Appendix G, page 293**).

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

Section 2 of NEMA sets out a number of principles (see section 5.7 above) that are relevant to the:

- EIA process, such as:
  - Adopt a risk-averse and cautious approach;
  - Anticipate and prevent or minimise negative impacts;
  - Pursue integrated environmental management;
  - Involve stakeholders in the process; and
  - Consider the social, economic and environmental impacts of activities; and regarding the
- Project such as:
  - Place people and their needs at the forefront of concern and serve their needs equitably;
  - Ensure development is sustainable, minimises disturbance of ecosystems and landscapes, pollution and waste, achieves responsible use of non-renewable resources and sustainable exploitation of renewable resources;
  - Assume responsibility for project impacts throughout its life cycle; and the
  - Polluter pays for remediation costs.

This EIA process complies with the principles set out in section 2 of NEMA through its adherence to the EIA Regulations 2014 (as amended), and associated guidelines, which set out clear requirements for, inter alia, impact assessment and stakeholder involvement, and through the assessment of impacts and identification of mitigation measures during the Impact Assessment Phase.

- The Preferred and Only Alternative is considered in the Impact Assessment Phase (see Section 6) and the Impact Tables attached at **Appendix F, page 259**.

- The potential social and environmental impacts of the project are identified, assessed and evaluated using the impact assessment methodology (Section 9.4) to understand the significance of each positive and negative impact. The Impact Tables are attached at **Appendix F, page 259**.
- An **EMPr** has been compiled (page 96) of this report to ensure that potential environmental impacts are prevented or minimised.
- Mitigation measures are recommended in the Impact Assessment Phase to allow for unavoidable impacts on the environment and people's environmental rights to be minimized and remedied.
- Opportunities for public participation are allowed in the EIA process.
- The needs and interests of I&APs will be taken into account.
- All relevant information is being made available for public comment before submission to DMR, as part of the public participation process.
- No comments were received on the Draft Scoping Report and should comments be received from the relevant government departments and I&APs in the EIA phase; these comments will inform the decisions taken by DMR regarding the Environmental Authorisation of the project.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

15 DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

15.1 Details of the EAP

Refer to Section 1.1 In Part A above.

15.2 Description of the Aspects of the Activity

Refer to Section 9.10 and Table 7 above.

15.3 Composite Map

This is addressed in Section 8 in each environmental baseline map, in conjunction with the Mine Site Plans in Figure 4 and Figure 5.

15.4 Description of Impact Management objectives including Management Statements

This is addressed in Section 11.4.1 in Part A above.

15.5 Determination of Impact management objectives including management statements

15.5.1 Determination of Closure Objectives

Objective 1 - To create a safe and healthy post-mining environment

- Safe excavations
  - Slope stability of the remaining excavation
  - No potentially dangerous areas secured if required
- Limited residual environmental impact
  - Develop a landscape that reduces the requirement for long term monitoring and management
  - No surface and/or groundwater contamination
  - Waste management practices not creating or leaving legacies

Objective 2 - To create a stable, free-draining post-mining landform, which is compatible with the surrounding landscape

- Economically viable and sustainable land, as close as possible to its natural state.
  - Prepare an area to promote natural re-establishment of vegetation that is self-sustaining, perpetual and provides a sustainable habitat for local fauna and successive flora species
  - Prevent long term changes in land use by implementing prompt rehabilitation and maintenance of disturbances when possible as part of the annual Rehabilitation Plan.
- Stable, free-draining post-mining landform
  - Prevent alteration or diverting natural drainage lines and reduced natural runoff.
  - Prevent concentration of runoff, mixing of clean runoff with contaminated runoff and creation of large open water bodies.

Objective 3 – To provide optimal post-mining social opportunities

- Optimised benefits for the social environment
  - Positive and transparent relationships with stakeholders and maintaining communication channels, providing stakeholders including government authorities with relevant information as per legislative requirements.
  - Undertaking environmental management according to approved **EMPr** and Final Rehabilitation, Decommissioning and Mine Closure Plans and regular auditing of the environmental management system.

- Minimal negative aesthetic impact
  - Mitigate the nuisance effects of air emissions (dust), visual intrusion and the cumulative effect of an increase in the ambient noise levels
  - Prevent disturbance of archaeological sites and implement mitigating measures according to the heritage and paleontological assessment.

15.5.2 The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity

The mitigation measures contained in **Table 17** and **Appendix F, page 259** provide the measures for managing any environmental damage, pollution, water or ecological degradation.

In addition, an Environmental Control Officer is required to audit the mine on an annual basis, to ensure that mitigation measures are employed correctly and continuously.

15.5.3 The potential risk of Acid Mine Drainage

No acid mine drainage is associated with diamond mining and tailings.

15.5.4 Steps taken to investigate, assess, and evaluate the impact of acid mine drainage

Not applicable.

15.5.5 Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage

Not applicable.

15.5.6 Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage

Not applicable.

15.5.7 Volumes and rate of water use required for the mining operation

Water is obtained from boreholes present in the mining area and stored in a 45 000-litre reservoir. Supply lines from the reservoir to the logistical facilities and plant needs to be upgraded and underground pipelines demarcated. This storage will also provide an emergency supply for the fire hydrants.

A Water Use License (Reference 25176121) in terms of Section 21(a) of the National Water Act (NWA) for the abstraction of groundwater for a total of 35 000m³ per year, and for the disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21(g) of the NWA, was obtained from the Department of Human Settlements, Water and Sanitation (DHSWS) dated 02/09/2019. A copy of the license is appended in **APPENDIX D: WATER USE GENERAL AUTHORISATION**, page 161.

15.5.8 Has a water use license been applied for?

The WULA was submitted as a separate application and was issued. Refer to Section **22**, **APPENDIX D: WATER USE GENERAL AUTHORISATION**, page 161 for a copy of the issued licenses.

15.6 Impacts to be mitigated in their respective phases

Table 17: Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Site Access & Site Establishment	**CONSTRUCTION**	TOTAL EXTENT OF AREA REQUIRED FOR MINING Target 1 = 71.2724 Ha Target 2 = 19.6778 Ha Target 3 = 3.2261 Ha Target 4 = 15.5578 Ha Target 5 = 16.5630 Ha Target 6 = 16.4020 Ha Target 7 = 10.2091 Ha Target 8 = 14.7922 Ha Tailings storage Facility and processing will be located in excavated and disturbed areas. The extent of the area required for infrastructure: Infrastructure and mine logistics: 2.5 Ha Access Road: 4.37 km	**IMPACT 1: SOIL EROSION & SOIL COMPACTION** • After clearing, the affected area shall be stabilised to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. • Incremental clearing of ground cover should take place to avoid unnecessarily exposed surfaces. • Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and potential stormwater run-off. • Topsoil shall be removed separately and stockpiled separately from other soil base layers. • The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. • Topsoil storage areas must be convex and should not exceed 2m in height. • Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g., by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. • In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. • Reduce drop height of material to a minimum. • Temporarily halt material handling in windy conditions. • A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. • Soil erosion on haul roads is to be regularly monitored and repaired. • Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation.	NEMA Section 2 Principles Environmental Authorisation	Start of activity and continuous as mining progresses over the site during the construction period (site access and site establishment activities) Upon cessation of each activity where applicable. Immediately in the event of spills

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Tailings may only be located in the old, disturbed area to reduce impacts on undisturbed areas.		
			IMPACT 2: WATER RESOURCES (QUALITY & QUANTITY): • Follow an 8 hour per day pumping schedule. • Place oil traps under stationary machinery, only re-fuel machines at fuelling station, construct structures to trap fuel spills at fuelling station, immediately clean oil and fuel spills and dispose of contaminated material (soil, etc.) at licensed sites only. • Take care that temporary onsite sanitation facilities are well maintained and serviced regularly. • Draw-up and strictly enforce procedures for the storage, handling and transport of different hazardous materials. • Ensure vehicles and equipment are in good working order and drivers and operators are properly trained. • Ensure that good housekeeping rules are applied. • Minimise storage of hazardous substances on-site during construction. • Service and refuel construction vehicles at a fit-for-purpose facility to minimise pollution risks. • Waste materials generated on-site must be stored in suitable lidded containers and removed off-site to a suitable disposal facility. • The waste separation must be undertaken if practical for recycling. • Provide all workers with environmental awareness training and comply with the requirements of the EMPr. • Provide mobile ablution facilities • Drinking water to be brought on-site as per existing practices. <u>Wastewater (i.e., including process water and grey water)</u> • A biozone system will be used to treat effluent (containerised). • By keeping contaminated and clean water separate and establishing controlled runoff washing bays, the flow and end destination of decontamination washing water will be controlled. • Although erosion and runoff are natural processes it should be managed by maintaining topsoil in any areas, not in use and maintaining maximum existing vegetation coverage.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Slow stormwater runoff with contoured, low-gradient drains and channels. • Stormwater diversion and erosion control contour berm separate clean and contaminated water systems around the excavations and infrastructure areas. Although erosion and runoff are natural processes it should be managed by maintaining topsoil in any areas, not in use and maintaining maximum existing vegetation coverage.		
			IMPACT 3: IMPACT ON BIODIVERSITY • Demarcate the excavation and resource target areas, and topsoil stockpiles using a sand colour shade cloth to contain the area of disturbance. • Leave a 50cm gap between the bottom of the shade cloth and the ground to allow for the movement of small fauna. • Demarcate the sections of existing tracks that may be used to access each resource area, including the area for turning circles of vehicles. • Conduct a "search and rescue" operation to identify any plants of conservation concern before clearing each resource area, and for the increased area required for inferred resources. • No indigenous plants outside of the demarcated work areas may be damaged or removed. • Remove alien invasive vegetation if required and ensure ongoing alien vegetation clearing in the resource target areas. • The noise and vibration caused by the earthmoving equipment will disturb mobile fauna that should move away when activities commence. Should any animals be encountered, these should be relocated by a suitably trained nature conservation officer. • Demarcate areas for the resource target areas and ensure that all other adjacent areas are regarded as no-go areas. • A 10m buffer must be left between the river/tributary and target areas as well as inferred resource area, where no excavation may take place. • The Final Rehabilitation, Decommissioning and Mine Closure Plan must be implemented.		
			IMPACT 4: CONTAMINATION & POLLUTION • Oils and lubricants must be stored within sealed containment structures.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately. • Waste materials generated on-site must be stored in suitable lidded containers and removed off-site to a suitable disposal facility. • The waste separation must be undertaken. • Provide all workers with environmental awareness training. • Provide a bin at the site. • Regularly dispose of any solid waste at a municipal waste disposal site. • Ensure all workers comply with the requirements of the EMPr. • Provide mobile ablution facilities.		
			IMPACT 5: VISUAL LANDSCAPE • The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • Mitigation of the visual impact by the screening of open excavations with sand colour shade cloth.		
			IMPACT 6: EMISSIONS • The Applicant shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations. • The Applicant shall limit noise levels (e.g., install and maintain silencers on machinery). The provisions of SANS 1200A Sub-clause 4.1 regarding "built-up" area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. • Construction and demolition activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact of noise of neighbours. No amplified music shall be allowed on site.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Hauling vehicles shall adhere to municipal and provincial traffic regulations including speed limits. • Vehicles used on-site for construction-related activities shall be maintained and in good working condition to reduce emissions. • Engines shall be turned off when the vehicle is temporarily parked or stationary for long periods. • Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material. • Incremental clearing of ground cover should take place to avoid unnecessarily exposed surfaces. • Health and safety equipment is required for workers. • The wetting of the roads helps reduce dust generation during transporting of processing materials. • No amplified music should be allowed on site. • Existing tracks will be used as haul roads and will only be upgraded to facilitate haul trucks by applying dust suppression and/or hardening compounds such as Macadamite. • On public roads, the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. • Vehicles used on-site for construction-related activities shall be maintained and in good working condition to reduce emissions. • Engines shall be turned off when the vehicle is temporarily parked or stationary for long periods **IMPACT 7: ARCHAEOLOGICAL RESOURCES AND GRAVES** <u>The following recommendations are made:</u> No further surveys are required within the study areas considered here. However, if any work is proposed outside of the surveyed areas, then these areas must be covered in the field to determine whether any archaeological sites are present. In addition to invasive activities like prospecting and mining, this includes uses such as stockpiling of excavated materials or construction of supporting infrastructure. Should any activity need to occur within the areas demarcated in Figure 50 (of the HIA) then an archaeologist should be commissioned to effect mitigation measures. These measures would entail conducting excavations to record and sample the archaeological materials. It is strongly recommended that the		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			historical copper mining complex and grave site be avoided completely but mitigated can be carried if absolutely necessary. • The fossil find procedures must be incorporated into the EMPr and applied whenever fossil finds are made. This includes the reporting of all finds to a palaeontologist. • The identified significant archaeological sites and their buffers must be included on mine maps and if any are to be disturbed for any reason then archaeological mitigation must be affected (under a permit issued by SAHRA) and approved by SAHRA prior to commencement of mining work. • The historic copper mining complex and grave site should be avoided altogether (see Grade IIIA sites on Figure 50 of the HIA); and • If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.		
			IMPACT 8: POTENTIAL IMPACTS ON PALEONTOLOGICAL RESOURCES Mitigation measures to reduce residual risk or enhance opportunities: • Identify and appoint stand-by palaeontologist should paleontological finds be uncovered. • Mine personnel to be alert for rare fossil bones and follow "Fossil Finds Procedure" (Appendix 2 of the PIA). • On discovery of in situ fossil bones during sampling/mining, cease excavation and protect fossils from further damage. • On discovery of potential fossils in ex-situ sandstones, remove to a safekeeping site. • On discovery of fossils in rotary pan concentrate, collect to labelled bag. • Contact appointed palaeontologist providing information and images. • Palaeontologist will assess information and establish suitable response, such as the importance of the find and recommendations for preservation, collection and record keeping.		
			IMPACT 11: SOCIO-ECONOMIC		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Employment of local previously disadvantaged labour wherever possible, with the provision of training (upskilling)		
Mining in progress	**OPERATIONAL**	TOTAL EXTENT OF AREA REQUIRED FOR MINING Target 1 = 71.2724 Ha Target 2 = 19.6778 Ha Target 3 = 3.2261 Ha Target 4 = 15.5578 Ha Target 5 = 16.5630 Ha Target 6 = 16.4020 Ha Target 7 = 10.2091 Ha Target 8 = 14.7922 Ha Tailings storage Facility and processing will be located in excavated and disturbed areas. The extent of the area required for infrastructure: Infrastructure and mine logistics: 2.5 Ha Access Road: 4.37 km	**IMPACT 1: CHANGE IN TOPOGRAPHY** • Excavations will be backfilled immediately after processing for security and safety reasons before the project is moved to the next resource target. In case of the sudden closure of the project, there will only be one open excavation to be dealt with as part of final decommissioning and rehabilitation. • At final closure, the floor of the excavations needs to be levelled and the sides sloped to create an even depression. **IMPACT 2: SOIL EROSION & SOIL COMPACTION** • After clearing, the affected area shall be stabilised to prevent any erosion or sediment runoff. Stabilised areas shall be demarcated accordingly. • Incremental clearing of vegetation should take place to avoid unnecessarily exposed surfaces. • Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against wind and stormwater run-off. • Reduce drop height of material to a minimum. • Temporarily halt material handling in windy conditions. • A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. • Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. • The basic rehabilitation methodology will therefore strive to replicate the pre-mining topography, wherever possible, or at least not to increase overall slope gradients without emplacement of adequately designed erosion control or runoff diversion structures. • Provision must also be made for efficient stormwater control to prevent erosion of roadways. • Soil erosion on haul roads is to be regularly monitored and repaired. • Topsoil shall be removed separately and stockpiled separately from other soil base layers.	NEMA Section 2 Principles Environmental Authorisation	During the estimated 30-year lifespan of the mine. Start of activity and continuous as mining progresses over the site during the operational period. Upon cessation of each activity where applicable. Immediately in the event of spills.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. • Topsoil storage areas must be convex and should not exceed 2m in height. • Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g., by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. • In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. • Tailings may only be located on the open excavations to reduce impacts on undisturbed areas.		
			IMPACT 3: WATER RESOURCES <u>Implement and follow water-saving procedures and methodologies.</u> • Follow an 8 hour per day pumping schedule. • Place oil traps under stationary machinery, only re-fuel machines at fuelling station, construct structures to trap fuel spills at fuelling station, immediately clean oil and fuel spills and dispose of contaminated material (soil, etc.) at licensed sites only. • Take care that temporary onsite sanitation facilities are well maintained and serviced regularly. • Draw-up and strictly enforce procedures for the storage, handling and transport of different hazardous materials. • Ensure vehicles and equipment are in good working order and drivers and operators are properly trained. • Ensure that good housekeeping rules are applied. • Minimise storage of hazardous substances on-site during construction. • Service and refuel construction vehicles at a fit-for-purpose facility to minimise pollution risks. • Waste materials generated on-site must be stored in suitable lidded containers and removed off-site to a suitable disposal facility. • The waste separation must be undertaken if practical for recycling.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Provide all workers with environmental awareness training and comply with the requirements of the EMPr. • Provide mobile ablution facilities • Drinking water to be brought on-site as per existing practices. <u>Wastewater (i.e., including process water and grey water)</u> • A biozone system will be used to treat effluent (containerised). • By keeping contaminated and clean water separate and establishing controlled runoff washing bays, the flow and end destination of decontamination washing water will be controlled. • Although erosion and runoff are natural processes it should be managed by maintaining topsoil in any areas, not in use and maintaining maximum existing vegetation coverage. • Slow stormwater runoff with contoured, low-gradient drains and channels. • Stormwater diversion and erosion control contour berm separate clean and contaminated water systems around the excavations and infrastructure areas.		
			IMPACT 4: IMPACT ON BIODIVERSITY • Demarcate the excavation and resource target areas, and topsoil stockpiles using shade cloth to contain the area of disturbance. • Leave a 50cm gap between the bottom of the shade cloth and the ground to allow for the movement of small fauna. • Demarcate the sections of existing tracks that may be used to access each resource area, including the area for turning circles of vehicles. • Conduct a "search and rescue" operation to identify any plants of conservation concern before clearing each resource area, and for the increased area required for inferred resources. • No indigenous plants outside of the demarcated work areas may be damaged or removed. • Remove alien invasive vegetation if required and ensure ongoing alien vegetation clearing in the resource target areas. • The noise and vibration caused by the earthmoving equipment will disturb mobile fauna that should move away when activities commence. Should		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			any animals be encountered, these should be relocated by a suitably trained nature conservation officer. • Demarcate areas for the resource target areas and ensure that all other adjacent areas are regarded as no-go areas. • A 10m buffer must be left between the river/tributary and target areas as well as inferred resource area, where no excavation may take place. • The Final Rehabilitation, Decommissioning and Mine Closure Plan must be implemented.		
			IMPACT 5: CONTAMINATION & POLLUTION ○ **Tailings collected within the tailings storage facility and dumped into open excavations as part of ongoing rehabilitation.** - Water used as part of processing will be collected in the tailings storage facility from where the water will be re-used if possible. • **Overburden, cover, and/or "soft" material including topsoil** • Remove and stockpile 300mm topsoil in berms or heaps less than 1,5m high and turn soil or re-use every six months. • Remove and stockpile topsoil building platforms and stockpile areas before construction for use to restore disturbed areas. To ensure long-term stability, the restored soil cover should attempt to mimic the pre-mining distribution of soil texture and thickness. • Contaminated soil must be treated by first removing the source of contamination - removing the source of contamination should allow the system to recover without further clean-up required. • Petrochemical spillages are to be collected in a drip tray and drum to store excavated spill affected soil for disposal at a registered facility or onsite treatment. • The most promising techniques for on-site treatment involve bioremediation. Bioremediation involves the use of microorganisms to destroy hazardous contaminants. • **Other non-specification waste** - Any product stockpiles left or oversize boulders must be removed and used to backfill excavations. - Waste or rock material used as refill or landscaping, crushed for other applications, or otherwise dealt with responsibly. • **Industrial waste (i.e., including hazardous wastes and oils and greases)**		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Separation of wastes into classes will ensure that waste is disposed of safely and according to the correct procedure. To ensure that waste classes are kept in separate streams, people will be trained on the different waste classes. • Unwanted steel, sheet metal and equipment need to be stored in a demarcated salvage yard. • Recycling and reusing materials may reduce garbage haul fees or generate income through the sale of scrap metal and old equipment. • All steel structures and reinforcing will be discarded or sold as scrap. • All equipment and other items used during the mining operation need to be removed from the site. • Used oils/hydrocarbons fuels/liquids are to be collected in sealed containers (stored on concrete slabs) and removed from the site for recycling by a reputable company. • All waste in the temporary storage area for used lubrication products and other hazardous chemicals will be disposed of at a collection point from where it will be collected by a waste recycling company. • Mobile generators will supply electricity to the machinery. Generator bays will be constructed with the necessary pollution control measures (drip trays). • Clean out the content of oil traps and dispose of waste at registered and purpose-designed landfill sites. • Hydrocarbon contaminated sludge (collected in oil traps) - Removed from the oil traps and removed from the site for recycling (if possible) or disposal at a suitably permitted facility. • All temporary waste storage areas need to be cleaned out and waste removed. • Tyres to be return to the supplier or a company that uses old tyres for making doormats, shoes, swings, etc. • Batteries to be return to the supplier or dispose of at a permitted hazardous waste facility. • Fluorescent tubes to be collected in sealed containers (stored on concrete slabs) and removed from the site for disposal at a permitted hazardous waste facility.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Chemical containers to be returned to the supplier or disposed of at a legal, permitted facility that is capable of disposing of the waste. (DO NOT sell chemical containers to workers or communities). • Laboratory waste (chemicals) - Returned to the supplier or disposed of at a permitted facility that is capable of disposing of the waste. • Industrial chemicals (laboratory waste) - Returned to the supplier or disposed of at a permitted facility that is capable of disposing of the waste. These liquid wastes cannot be disposed of in the waste dumps. • **Domestic waste (i.e., waste that is generated from the accommodation and offices)** • Domestic waste - Separated at source into recyclable products. These must then be removed and recycled by recognised contractors. (Note that the mine is responsible for the waste from cradle to grave). • Disposal at a registered and officially permitted commercial or municipal landfill site is the most cost-effective option for materials that cannot be recycled. • Domestic waste generated by workers needs to be sorted and all biodegradable waste must be stored in separate drums provided for. • This biodegradable waste will be dumped in a landfill provided for onsite. Laboratory waste (chemicals) - Returned to the supplier or disposed of at a permitted facility that is capable of disposing of the waste. • Industrial chemicals (laboratory waste) - Returned to the supplier or disposed of at a permitted facility that is capable of disposing of the waste. These liquid wastes cannot be disposed of in the waste dumps. <u>Domestic waste (i.e., waste that is generated from the accommodation and offices)</u> • Domestic waste - Separated at source into recyclable products. These must then be removed and recycled by recognised contractors. (Note that the mine is responsible for the waste from cradle to grave). • Disposal at a registered and officially permitted commercial or municipal landfill site is the most cost-effective option for materials that cannot be recycled. • Domestic waste generated by workers needs to be sorted and all biodegradable waste must be stored in separate drums provided for. • This biodegradable waste will be dumped in a landfill provided for onsite.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			IMPACT 6: VISUAL LANDSCAPE • The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • Mitigation of the visual impact by the screening of mining excavations with sand colour shade cloth.		
			IMPACT 7: EMISSIONS • Health and safety equipment is required for workers. • The wetting of the roads helps reduce dust generation during transporting of processing materials. • No amplified music should be allowed on site. • Existing tracks will be used as haul roads and will only be upgraded to facilitate haul trucks by applying dust suppression and/or hardening compounds such as Macadamite. • On public roads, the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. • Vehicles used on-site for construction-related activities shall be maintained and in good working condition to reduce emissions. • Engines shall be turned off when the vehicle is temporarily parked or stationary for long periods. • Incremental clearing of ground cover should take place to minimise exposed surfaces.		
			IMPACT 8: ARCHAEOLOGICAL RESOURCES AND GRAVES **The following recommendations are made:** No further surveys are required within the study areas considered here. However, if any work is proposed outside of the surveyed areas, then these areas must be covered in the field to determine whether any archaeological sites are present. In addition to invasive activities like prospecting and mining, this includes uses such as stockpiling of excavated materials or construction of supporting infrastructure. • Should any activity need to occur within the areas demarcated in Figure 50 (of the HIA) then an archaeologist should be commissioned to effect mitigation measures. These measures would entail conducting excavations to record and sample the archaeological materials. It is strongly		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			recommended that the historical copper mining complex and grave site be avoided completely but mitigated can be carried if absolutely necessary. • The fossil find procedures must be incorporated into the EMPr and applied whenever fossil finds are made. This includes the reporting of all finds to a palaeontologist. • The identified significant archaeological sites and their buffers must be included on mine maps and if any are to be disturbed for any reason then archaeological mitigation must be affected (under a permit issued by SAHRA) and approved by SAHRA prior to commencement of mining work. • The historic copper mining complex and grave site should be avoided altogether (see Grade IIIA sites on Figure 50 of the HIA); and • If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.		
			IMPACT 9: PALEONTOLOGICAL RESOURCES Mitigation measures to reduce residual risk or enhance opportunities: • Identify and appoint stand-by palaeontologist should paleontological finds be uncovered. • Mine personnel to be alert for rare fossil bones and follow "Fossil Finds Procedure" (Appendix 2 of the PIA). • On discovery of in situ fossil bones during sampling/mining, cease excavation and protect fossils from further damage. • On discovery of potential fossils in ex-situ sandstones, remove to a safekeeping site. • On discovery of fossils in rotary pan concentrate, collect to labelled bag. • Contact appointed palaeontologist providing information and images. • Palaeontologist will assess information and establish suitable response, such as the importance of the find and recommendations for preservation, collection and record keeping.		
			IMPACT 10: SOCIO-ECONOMIC		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Employment of local previously disadvantaged labour wherever possible, with the provision of training (upskilling)		
Final Rehabilitation and removal of temporary infrastructure	**DECOMMISSIONING**	TOTAL EXTENT OF AREA REQUIRED FOR MINING Target 1 = 71.2724 Ha Target 2 = 19.6778 Ha Target 3 = 3.2261 Ha Target 4 = 15.5578 Ha Target 5 = 16.5630 Ha Target 6 = 16.4020 Ha Target 7 = 10.2091 Ha Target 8 = 14.7922 Ha Tailings storage Facility and processing will be located in excavated and disturbed areas. The extent of the area required for infrastructure: Infrastructure and mine logistics: 2.5 Ha Access Road: 4.37 km	**IMPACT 1: BIOPHYSICAL ENVIRONMENT** • Implementation of Final Rehabilitation, Decommissioning and Mine Closure Plan. • After processing, the excavation will be backfilled immediately for security and safety reasons before the project is moved to the next excavation area. In case of the sudden closure of the project, there will only be one excavation to be dealt with as part of final decommissioning and rehabilitation. • At final closure, the floor of the excavation needs to be levelled and the sides sloped to create an even depression., The focus of topographic rehabilitation may not be obvious at the time of mine planning and must be addressed as the mine develops and the Final Rehabilitation, Decommissioning and Mine Closure Plan must be reviewed periodically for continued relevance in the light of changed mining path or long-term plans. • Regular inspections and audits will be used as a management system to ensure compliance. • Compacted areas shall be scarified after use during decommissioning and rehabilitation. • Any stored topsoil shall be spread over the scarified surface. • **Other mitigating concerning residual environmental impact** • Implementing screening as part of the cleaning activities before materials are moved from the mine. • The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned. • Any compacted movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled. • Redundant structures will be removed for use elsewhere or demolished and discarded. • Remove all power and water supply installations not to be retained by the landowner in terms of section 44 of the MPRDA. • Final walkthrough of complete mining lease area to ensure no mining-related waste and re-usable infrastructure remain on site.	NEMA Section 2 Principles Environmental Authorisation	

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• As part of this phase training of personnel in the implementation of the Final Rehabilitation, Decommissioning and Mine Closure Plan will be done and the implementation of the Environmental Awareness Plan will be an ongoing process. **IMPACT 2: SOCIO-ECONOMIC ENVIRONMENT** • Ongoing employment of local previously disadvantaged labour wherever possible, with the provision of training (upskilling) **IMPACT 3: ARCHAEOLOGICAL RESOURCES AND GRAVES** **The following recommendations are made:** No further surveys are required within the study areas considered here. However, if any work is proposed outside of the surveyed areas, then these areas must be covered in the field to determine whether any archaeological sites are present. In addition to invasive activities like prospecting and mining, this includes uses such as stockpiling of excavated materials or construction of supporting infrastructure. • Should any activity need to occur within the areas demarcated in Figure 50 (of the HIA) then an archaeologist should be commissioned to effect mitigation measures. These measures would entail conducting excavations to record and sample the archaeological materials. It is strongly recommended that the historical copper mining complex and grave site be avoided completely but mitigated can be carried if absolutely necessary. • The fossil find procedures must be incorporated into the EMPr and applied whenever fossil finds are made. This includes the reporting of all finds to a palaeontologist. • The identified significant archaeological sites and their buffers must be included on mine maps and if any are to be disturbed for any reason then archaeological mitigation must be affected (under a permit issued by SAHRA) and approved by SAHRA prior to commencement of mining work. • The historic copper mining complex and grave site should be avoided altogether (see Grade IIIA sites on Figure 50 of the HIA); and • If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.		

15.7 Impact Management Outcomes

Table 18: Impact Management Outcomes

ACTIVITY (Whether listed or not listed).	**POTENTIAL IMPACT**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated	**MITIGATION TYPE**	**STANDARD TO BE ACHIEVED**
Site access	Disturbance of fauna and flora	Biodiversity	Construction	Remedy through restriction and rehabilitation	Impacts are minimised and mitigated. End-use objectives achieved through rehabilitation according to the Closure Plan included in **APPENDIX G: REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN**, page 293
	Soil compaction and erosion	Soil resource		Control through monitoring and management	
Site establishment, including waste generation and management	Visibility	Visual intrusion	Construction	Control through monitoring and management	Impacts are minimised and mitigated. End-use objectives achieved through rehabilitation according to the Closure Plan included in **APPENDIX G: REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN**, page 293.
	Emissions (dust, noise & vehicles)	Noise & Air quality		Control through monitoring and management	
	Disturbance of fauna and flora	Biodiversity		Remedy through restriction and rehabilitation	
	Soil and sand contamination, soil compaction and disturbance	Soil resource		Remedy through restriction and rehabilitation & control through monitoring and management	
	Destruction or loss of Heritage & Paleontological resources	Cultural, Graves, Archaeology, Heritage and Palaeontology		Avoidance by the relocation of activity if required Management via permit application for the destruction of heritage resources, with potential for salvage	Impact avoided Impact mitigated
Removal of gravel, loading and hauling, processing, tailings waste generation and management	Change in landscape	Topography	Operation	Remedy through restriction and rehabilitation	Impacts are minimised and mitigated. End-use objectives achieved through rehabilitation according to the Closure Plan included in **APPENDIX G: REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN**, page 293.
	Soil and groundwater contamination, and waste management	Contamination & Pollution		Control through monitoring and management	
	Visibility	Visual		Control through monitoring and management	
	Emissions (dust, noise & vehicles)	Noise & Air quality		Control through monitoring and management	

ACTIVITY (Whether listed or not listed).	**POTENTIAL IMPACT**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated	**MITIGATION TYPE**	**STANDARD TO BE ACHIEVED**
	Disturbance of fauna and flora	Biodiversity and salt pan		Remedy through restriction and rehabilitation	
	Soil erosion and compaction	Soil resource		Remedy through restriction and rehabilitation & control through monitoring and management. Management and control would include a focus on recycling water wherever possible.	
	Use of borehole water for mining process and potable water for domestic use	Groundwater resource			
	Destruction or loss of Heritage & Paleontological resources	Cultural, Graves, Archaeology, Heritage and Palaeontology		Avoidance by conducting a heritage and paleontological impact assessment, followed by control and management if necessary.	Impact mitigated or avoided
Removal of temporary infrastructure and site rehabilitation	Dust emissions (vehicle entrained dust)	Soil resource	Decommissioning	Control through monitoring and management	Impacts are minimised and mitigated. End-use objectives achieved through rehabilitation according to the Closure Plan included in **APPENDIX G: REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN**, page 293.
	Soil erosion due to a slow recovery of vegetation	Soil resource & biodiversity		Remedy through restriction and rehabilitation & control through monitoring and management	
	Change in topography	Topography			

15.8 Impact Management Actions

Table 19: Impact Management Actions

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Site access	Disturbance of fauna and flora	Remedy through restriction and rehabilitation Control through monitoring and management	Concurrently with site access activities Upon cessation of activity	Remain within the ambit of the Mining Right Programme and Environmental Authorisation
	Soil compaction and erosion			
Site establishment, including waste generation and management	Visibility	Control through monitoring and management		
	Emissions (dust, noise & vehicles)			
	Disturbance of fauna and flora	Remedy through restriction and rehabilitation		
	Soil and sand contamination, soil compaction and disturbance	Remedy through restriction and rehabilitation & control through monitoring and management		
	Destruction or loss of Heritage & Paleontological resources	Avoidance		
Removal of overburden, and mineral resource material, loading and hauling, waste generation ad management	Change in Topography	Remedy through restriction and rehabilitation	Concurrently with site access activities Upon cessation of activity	Remain within the ambit of the Mining Right Programme and Environmental Authorisation, and General Authorisation.
	Visibility	Control through monitoring and management		
	Emissions (dust, noise & vehicles)	Control through monitoring and management		
	Disturbance of fauna and flora	Remedy through restriction and rehabilitation		
	Soil and sand contamination, soil compaction and disturbance	Remedy through restriction and rehabilitation & control through monitoring and management		
	Use of borehole water for mining process and potable water for domestic use			
	Destruction or loss of Heritage & Paleontological resources	Avoidance		
Removal of temporary infrastructure and site rehabilitation	Dust emissions (vehicle entrained dust)	Control through monitoring and management	Upon cessation of activity	Remain within the ambit of the Mining Right Programme and Environmental Authorisation
	Soil erosion due to a slow recovery of vegetation			

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Change in topography	Remedy through restriction and rehabilitation & control through monitoring and management		

16 FINANCIAL PROVISION

16.1 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation

As detailed in Section 15.5.1 above:

Objective 1 - To create a safe and healthy post-mining environment

- Safe excavations
  - Slope stability of the remaining excavation
  - No potentially dangerous areas secured if required
- Limited residual environmental impact
  - Develop a landscape that reduces the requirement for long term monitoring and management
  - No surface and/or groundwater contamination
  - Waste management practices not creating or leaving legacies

Objective 2 - To create a stable, free-draining post-mining landform, which is compatible with the surrounding landscape

- Economically viable and sustainable land, as close as possible to its natural state.
  - Prepare the area to promote natural re-establishment of vegetation that is self-sustaining, perpetual and provides a sustainable habitat for local fauna and successive flora species
  - Prevent long term changes in land use by implementing prompt rehabilitation and maintenance of disturbances when possible as part of the annual Rehabilitation Plan.
- Stable, free-draining post-mining landform
  - Prevent alteration or diverting natural drainage lines and reduced natural runoff.
  - Prevent concentration of runoff, mixing of clean runoff with contaminated runoff and creation of large open water bodies.

Objective 3 – To provide optimal post-mining social opportunities

- Optimised benefits for the social environment
  - Positive and transparent relationships with stakeholders and maintaining communication channels, providing stakeholders including government authorities with relevant information as per legislative requirements.
  - Undertaking environmental management according to approved **EMPr** and Rehabilitation, Decommissioning and Closure Plan (**Appendix G, page 293**) and regular auditing of the environmental management system.
- Minimal negative aesthetic impact
  - Mitigate the nuisance effects of air emissions (dust), visual intrusion and the cumulative effect of an increase in the ambient noise levels
  - Prevent disturbance of heritage, archaeological and paleontological sites and implement mitigating measures according to the Heritage Impact Assessment and Paleontological Impact Assessment.

16.2 Confirm specifically that the environmental objectives in relation to closure have been consulted with the landowner and interested and affected parties

The closure objectives are included in this Draft EIR and in the Rehabilitation, Decommissioning and Mine Closure Plan (**Appendix G, page 293**) which is being made available to all registered Interested and Affected Parties.

16.3 Provide a Rehabilitation Plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure

Refer to the Rehabilitation, Decommissioning and Mine Closure Plan, which includes the Environmental Risk Assessment in **Appendix G, page 293**.

16.4 Explain why it can be confirmed that the Rehabilitation Plan is compatible with the closure objectives

The closure objectives are to return the land disturbed by mining activities back to its original condition. The Rehabilitation Plan provides the detail on how this will be achieved as detailed in **Appendix G, page 293**.

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

Refer to Part A, Section 12, and **APPENDIX G: REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN, page 293** of this report.

16.6 Confirm that the financial provision will be provided as determined

Refer to Part A, Section 12.3 of this report.

16.7 Mechanisms for monitoring compliance with and performance assessment against the Environmental Management Programme and reporting

Table 20: Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
All mining activities	All commitments are contained in the EIA Report and accompanying **EMPr**.	Ensure commitments made within the approved EIR and **EMPr** are being adhered to.	Site Manager and EAP.	Annual Undertake and submit an environmental performance audit to DMR
Site access and site establishment	Visual inspection of soil erosion and/or compaction	All exposed areas, access roads and soil stockpiles must be monitored for erosion regularly, specifically after rainfall events.	Site Manager and Independent EAP	Weekly, and after rain-fall events Weekly monitoring reports being signed-off by the Site Manager Corrective action to be confirmed and signed-off by the Site Manager. Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted to the Site Manager.
Operational - Diamond Mining	Visual inspection of biodiversity impacts Visual inspection of waste and effluent management, access and haul roads, housekeeping and maintenance.	Visual inspection of mining activities and other possible secondary impacts Control and prevent the development of new access tracks. Repair and maintenance of access roads and boundary fences. Control and prevent the growth of alien vegetation in cleared areas and on stockpiles. Standard waste management practices must be implemented to prevent contamination and littering. All spill incidents will be reported and corrective action taken in accordance with an established spill response procedure.	Site Manager & Contractor (or sub-contractors)	Daily Weekly monitoring reports being signed-off by the Site Manager. Corrective action to be confirmed and signed-off by the Project Site Manager. Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted. Report incidents in terms of the relevant legislation, including the MPRDA, NWA and NEMA.
Closure & Rehabilitation	Revegetation; Stability; Soil erosion Alien invasive species	Inspection of all rehabilitated areas to assess whether soil erosion is occurring and to implement corrective action where required.	Site Manager	Bi-Annual A final audit report for site closure must be submitted to the DMR for approval.

16.8 Indicate the frequency of the submission of the performance assessment/ environmental audit report

An external environmental performance audit and the EIA & **EMPr** performance assessment shall be conducted annually interchangeably by an independent environmental assessment practitioner.

17 ENVIRONMENTAL AWARENESS PLAN

17.1 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work

Environmental awareness and training include:

- Awareness training for contractors and employees.
- Job-specific training – training for personnel performing tasks that could cause potentially significant environmental impacts.
- Comprehensive training – on emergency response, spill management, etc.
- Specialised skills.
- Training verification and record-keeping.

Before commencement of the mining activities all new employees and contractors who are involved with such activities should attend relevant induction and training. It is standard practice for employees and the employees of contractors that will be working on a new project or at a new site to attend an induction course where the nature and characteristics of the project and the site are explained.

The training course should include key information abstracted from the **EMPr** pertaining to the potential environmental impacts, the mitigation measures that will be applied, the monitoring activities that will be undertaken and the roles and responsibilities of contractors and personnel.

The **EMPr** document will also be made available to attendees.

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

Environmental risks and how to manage them are dealt with in the induction course referred to in Section 17.1 above. Should an incident of environmental pollution or damage occur it will be analysed and appropriate prevention and/or mitigation measures developed. These measures will be added to the **EMPr** and conveyed to the relevant personnel.

All unplanned incidents with the potential to cause pollution or environmental degradation or conflict with local residents will be reported to the Mineral Resources Manager within 24 hours.

Hydrocarbon Spills: Hydrocarbon spills that are considered to be emergency incidents are large-scale spills (cover a surface area >1m²), resulting from situations such as: a leaking diesel bowser; an oil drum that is knocked over; and large spillages from equipment.
Activities that are involved in the clean-up of such instances include:

- The containment of the spill;
- The removal of all contaminated material; and,
- The disposal (at a licensed hazardous disposal facility) or bioremediation (at a licensed facility) of this material.

Fire: There is the potential for fire to occur in the following locations of the sand mining site:

- Veld fires across vegetated areas; and
- Vehicles and equipment.

Veld fires: Any person who observes the fire must report it to the fire brigade immediately and then to their supervisor. If possible, additional personnel may be sent to contain the fire, but only if the lives of the personnel will not be endangered.

Vehicles and Equipment: Fire extinguishers will be available at the site where sand mining activities will take place and in the vehicles. All staff members will be trained in the use of fire-fighting equipment.

17.3 The specific information required by the Competent Authority

Not applicable at this stage.

18 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, **Pieter Badenhorst** herewith undertake that the information provided in the foregoing report is correct including reference to Specialist Reports (as attached), and to be read in conjunction with the Disclaimer provided in the beginning of the report. Noting that no comments or inputs were received from stakeholders and Interested and Affected Parties on the Draft Scoping Report.

P. Badenhorst.

Signature of the Environmental Assessment practitioner:

GroenbergEnviro (Pty) Ltd

Name of company:

13 October 2021

Date: