

**PROPOSED PROSPECTING RIGHT WITH BULK SAMPLING
OVER VARIOUS FARMS IN THE HAY AND KURUMAN
ADMINISTRATIVE DISTRICTS, NORTHERN CAPE**

DRAFT SCOPING REPORT

**DEPARTMENTAL REFERENCE NUMBER:
NC 30/5/1/1/2/13826 PR**

FEBRUARY 2024

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EXECUTIVE SUMMARY

The Applicant, K2022641005 (SOUTH AFRICA) (Pty) Ltd, applied for a prospecting right (PR) with bulk sampling, and environmental authorisation (EA) for kieselguhr over 15 602.0765 ha that extends over the properties listed under *(b) Description of the Property* within the Hay and Kuruman Administrative Districts of the Northern Cape.

Should the relevant authorisations be granted, and the project commence the principal prospecting activities will entail the following:

- ❖ Non-Invasive Prospecting:
 - ◆ Desktop geological studies (Phase 1),
 - ◆ Geological field mapping (Phase 2),
 - ◆ Feasibility studies and target selection (Phase 4 & 6),
 - ◆ Metallurgical Testing and Analysis (Phase 4),
- ❖ Invasive Prospecting (with bulk sampling):
 - ◆ Drilling and excavation of trenches, exploration pits and collecting of bulk samples (Phase 3 & 5),
 - ◆ Sloping, landscaping, and rehabilitation the affected areas (Phase 3 & 5).

The proposed project triggers listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended) and therefore requires an environmental impact assessment that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures, to ultimately culminate in an environmental management programme that informs the competent authority (Department of Mineral Resources and Energy) when considering the environmental authorisation. This report, the Draft Scoping Report, forms part of the departmental requirements, and presents the first report of the EIA process.

Should the PR be issued, the proposed project will comprise of activities that can be divided into three key phases namely the:

- (1) *Site commencement/establishment phase*: Once the target areas were identified (during non-invasive prospecting) and the invasive prospecting commences (phase 3 & 5), site commencement/establishment will entail discussions with the landowners regarding access to the properties, the clearance of vegetation (where necessary) from the areas to be sampled, the stripping and stockpiling of the topsoil (where applicable), and the introduction of the prospecting equipment.
- (2) *Operational phase (Trenching and Sampling Pits)*: The targeting of all drilling and/or trenching activities will be dependent on the results obtained during the preceding non-invasive phases of prospecting. The initial planned invasive exploration activities will consist of exploration drilling, trenches, and pits to appropriate depths to target anomalies and testable material identified during Phases 1 & 2 of the non-

invasive prospecting. Down the hole geophysical surveying will take place upon completion of the exploratory trenching and pits along with ground surveys to determine positions of geological materials.

(3) *Decommissioning phase:* Rehabilitation will include activities that can be divided into medium- and long term categories. In the medium term, rehabilitation will entail the continuous reinstatement of prospected areas, and the management of invasive plant species and/or erosion. In the long term, rehabilitation will involve the reinstatement of the remaining disturbed areas (not yet reinstated), prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE). The PR holder will further be responsible for the seeding of all rehabilitated areas should vegetation not establish through succession within the first six months.

Need and Desirability:

Kieselguhr is a highly sought after mineral in the absorbent, cement, filtration, medical, and other industries. Other uses of kieselguhr include animal feed applications, natural de-wormer for animals, insect, and ant killer. Kieselguhr also has wide application for an anti-caking agent in grain storage as well as mixed feeds.

Within the Griqualand West area, kieselguhr appear to overlay either lava of the Ongeluk Sub-Group, or Dwyka shale (Base Kalahari Formation) along ancient water courses and paleo-marshes. This prospecting right application intends to identify feasible kieselguhr sources in the Northern Cape that can economically be exploited and contribute to the economy of the region.

Alternatives Considered:

a) The property on which, or location where, it is proposed to undertake the activity.

Presently, the project proposal entails the prospecting of 15 602.0765 ha area over the properties listed in section *b) Description of the Property* and presented in Figures 1 and 2. Applicants can only apply for prospecting rights within areas where such rights are not yet held by other companies/applicants. Furthermore, the prospecting activities are dependent upon the presence of the desired minerals which are again dependent upon geological formations. As the intention of the proposed prospecting operations is to determine the presence of economically viable kieselguhr deposits in the Northern Cape, an area known/expected to contain these resources needs to be selected. The proposed footprint of the PR application was based on the available geological information which is of interest to kieselguhr. No further location/site alternatives are considered in the Scoping and EIA process.

b) Type of activity to be undertaken

The proposed activity entails prospecting with bulk sampling. Prospecting will be conducted using a combination of non-invasive and invasive activities. The invasive prospecting will include drilling and trenching. The only other alternative would be to prospect the area without bulk sampling. However, the

Applicant entered a partnership with an international firm regarding the testing of the kieselguhr samples for metallurgical and production compatibility with their production plants. This company requires bulk samples to facilitate the metallurgical and production compatibility testing. Should bulk sampling be excluded from the project proposal the prospect of a possible international market for South African kieselguhr (should a mining right be considered) will remain unexploited. Further to this, kieselguhr has varying qualities and thus the samples must be distributed to a wide range of prospective clients that requires the collection of large samples.

a) Design and layout of the activity.

The preferred drilling, trenching and pitting locations will be determined following the outcome of phases 1 & 2 and the mapping of geological survey data. The EIAR will include a list of areas (identified by specialists) that must be avoided and where no prospecting may be allowed. This list will be expanded on upon consultation with the stakeholders.

b) Technology to be used in the activity.

The Applicant proposes to use air drills for RAB (rotary air blast) drilling and reverse circulation drilling and diamond drill rigs will be used for core drilling. Geophysical equipment will be needed for ground electro-magnetic, magnetic and gravity surveys.

The bulk sampling trenches/pits will be dug by excavator, upon which the loosened material will be moved by FEL to the crushing/milling plant. The material will be crushed, screened, and sized to stockpiles from where it will be transported off-site by trucks.

Although sample collection will require various mechanical equipment to be on site, the process do not require highly specialised technology as secondary processing and metallurgical testing will occur off-site. Therefore no technology alternatives were deemed viable for this project.

c) Operational aspects of the activity

The operational aspects of the activity will be based on the non-invasive prospecting results. The project allows some flexibility in terms of when, where, and how the sampling and surveying is conducted. For instance, the site camp location and jeep-track routes will be determined in accordance with the landowner agreement and identified sensitive areas that must be avoided. The project can also consider mitigating impacts such as dust generation, prospecting during agriculturally important seasons etc. The DEIAR will expand on the operational aspects of the project upon receipt of the specialist studies.

d) Option of not implementing the activity (No-go Alternative)

If the no-go alternative is implemented the land in question cannot be prospected for kieselguhr, which may result in a loss of an economically viable natural resource that can be used in a variety of industries. The no-go option will further entail a loss of employment opportunities, as well as socio-economic benefits and growth development opportunities. Given the high level of unemployment and poverty in the Hay and Kuruman Magisterial Districts the loss of such opportunities is considered significant. The positive implications of the no-go alternative are that there will be no impact on the current land use, bio- and geophysical environment of the earmarked areas.

Public Participation Process:

The relevant landowners, stakeholders and I&AP's will be informed of the prospecting right application by means of an advertisement in the Noordkaap Bulletin, and on-site notices that were placed at conspicuous places. A notification letter inviting comments on the DSR over a 30-days commenting period (ending 25 March 2024) will also be send to the landowners, lawful occupier, neighbouring landowners, stakeholders, and any other I&AP that may be interested in the project. Further to this an advertisement will be placed in the Noordkaap Bulletin inviting the surrounding landowners whose contact details could thus far not be obtained to register on the project. All comments received on the DSR will be incorporated into the final Scoping Report (FSR) to be submitted to the DMRE for consideration.

Scoping Report:

The scoping report identifies the potential positive and negative impacts that the proposed project may have on the environment and the community as well as the aspects that may impact on the socio-economic conditions of directly affected persons and proposes possible mitigation measure that could be applied to modify / remedy / control / stop the identified impacts.

Plan of Study for the Environmental Impact Assessment Process:

The aspects to be assessed as part of the environmental impact assessment process will include, but not be limited to, the following:

1. The need and desirability of the proposed activity will be discussed in detail and weighed against the no-go option of upholding the status quo at the study area.
2. The inputs received during the public participation process (first- and second phase) will be assessed and considered by the project team during the EIA process.
3. The findings, recommendations and management measure proposed in the specialist studies will be assessed during the EIA process and incorporated into the DEIAR.

4. The impact of the proposed project on the physical-, biological-, and human environments will be assessed.
5. Mitigation measures will be proposed to control, modify, remedy, or stop the impacts associated with the proposed activity on the surrounding environment.
6. Any additional requirements submitted by the DMRE will be incorporated into the DEIAR and treated accordingly.

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LIST OF ACRONYMS

| | |
|---------|--|
| CARA | Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) |
| CBA | Critical Biodiversity Area |
| DEIAR | Draft Environmental Impact Assessment Report |
| DFFE | Department of Forestry, Fisheries, and the Environment |
| DMRE | Department of Mineral Resources and Energy |
| DSR | Draft Scoping Report |
| DWS | Department of Water and Sanitation |
| EA | Environmental Authorisation |
| EAP | Environmental Assessment Practitioner |
| ECO | Environmental Control Officer |
| EIA | Environmental Impact Assessment |
| EMPR | Environmental Management Programme |
| ESA | Ecological Support Areas |
| FEIAR | Final Environmental Impact Assessment Report |
| FEL | Front-end-loader |
| FEPA | Freshwater Ecosystem Priority Area |
| FSR | Final Scoping Report |
| GPS | Global Positioning System |
| HIA | Heritage Impact Assessment |
| I&AP | Interested and Affected Party |
| IDP | Integrated Development Plan |
| JMLM | Joe Morolong Local Municipality |
| JTGDM | John Taolo Gaetsewe District Municipality |
| KMR | Kudumane Manganese Resources (Pty) Ltd |
| MHSA | Mine Health and Safety Act, 1996 (Act No 29 of 1996) |
| MPRDA | Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) |
| NEM:AQA | National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004) |
| NEM:BA | National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004) |
| NEM:WA | National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) |
| NEMA | National Environmental Management Act, 1998 (Act No 107 of 1998) |
| NHRA | National Heritage Resources Act, 1999 (Act No 25 of 1999) |
| NRTA | National Road Traffic Act, 1996 (Act No 25 of 1999) |
| NWA | National Water Act, 1998 (Act No 36 of 1998) |
| OHSA | Occupational Health and Safety Act, 1993 (Act No 85 of 1993) |
| PCB's | Polychlorinated Biphenyls |
| PCO | Pest Control Officer |

DIATOMITE / KIESELGUHR / DIATOMACEOUS EARTH PROSPECTING RIGHT
DRAFT SCOPING REPORT



| | |
|--------|--|
| PPE | Personal Protection Equipment |
| PR | Prospecting Right |
| PSDM | Pixley ka Seme District Municipality |
| PSM | Palaeontological Sensitivity Map |
| RAB | Rotary air blast |
| SAHRA | South African Heritage Resources Agency |
| SAMBF | South African Mining and Biodiversity Forum |
| SAMRAD | South African Mining Mineral Resources Administration System |
| SANBI | South African National Biodiversity Institute |
| SANS | South African National Standards |
| SLM | Siyancuma Local Municipality |
| SWMA | Sub-Water Management Area |
| TLM | Tsantsabane Local Municipality |
| UMK | United Manganese of Kalahari (Pty) Ltd |
| WMA | Water Management Area |
| SFMDM | ZF Mgqawu District Municipality |



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

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

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

NAME OF APPLICANT: K2022641005 (SOUTH AFRICA) (Pty) Ltd

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FILE REFERENCE NUMBER SAMRAD: NC30/5/1/1/2/13826 PR

IMPORTANT NOTICE

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

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

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

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of and provide all the information required in terms of this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet 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 order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the Applicant.

OBJECTIVE OF THE SCOPING PROCESS

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

SCOPING REPORT

2. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of: Greenmined Environmental (Pty) Ltd

In terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the environmental impact assessment (EIA) of any activities regulated in terms of the Act. K2022641005 (SOUTH AFRICA) (Pty) Ltd (hereinafter the “Applicant”) appointed Greenmined Environmental (Pty) Ltd (hereinafter “Greenmined”) to undertake the study needed. Greenmined has no vested interest in the Applicant or the proposed project and hereby declares its independence as required by the EIA Regulations, 2014 (as amended).

i) The EAP who prepared the report

Name of the Practitioner: Ms Christine Fouché (Senior Environmental Specialist)

Tel No: 021 851 2673 / 082 811 8514

Fax No: 086 546 0579

E-mail address: christine.f@greenmined.co.za

ii) Expertise of the EAP

(1) The qualifications of the EAP

(With evidence attached as **Appendix 1**)

Ms Fouché has a Diploma in Nature Conservation and a B.Sc. in Botany and Zoology. Full CV with proof of expertise is attached as Appendix 1.

(2) Summary of the EAP’s past experience

(Attach the EAP’s curriculum vitae as **Appendix 2**)

Ms Fouché has nineteen years’ experience in doing environmental impact assessments and mining related applications in South Africa. Ms Fouché is a registered Environmental Assessment Practitioner (registration no: 2019/1003) with EAPASA (Environmental Assessment Practitioners Association of South Africa) since 2019. See a list of past project attached as Appendix 2.

b) Description of the property

In this document any reference that is made to a specific farm includes all the relevant portions and remainders of that property unless otherwise noted.

| | |
|--|---|
| <p>Farm Name:</p> | <ol style="list-style-type: none"> 1. Remaining Extent of the farm Botha No 313 2. Portion 1 of the farm Botha No 313 3. Remaining Extent of the farm Devon No 277 4. Portion 1 of the farm Devon No 277 5. Portion 4 of the farm Bermolli No 583 6. Portion 5 of the farm Bermolli No 583 7. Remaining Extent of the farm Engelsdraai No 221 8. Portion 1 of the farm Engelsdraai No 221 9. Remaining Extent of the farm Witdraai No 204 10. Portion 1 of the farm Witdraai No 204 11. Remaining Extent of the farm Vaalwater No 84 12. Portion 1 of the farm Vaalwater No 84 13. Portion 2 of the farm Vaalwater No 84 <p><i>(In this document any reference that is made to a specific farm includes all the relevant portions and remainders of that property unless otherwise noted.)</i></p> |
| <p>Application area (Ha)</p> | <p>15 602.0765 ha</p> |
| <p>Magisterial district</p> | <ul style="list-style-type: none"> ❖ Hay Administrative District, and ❖ Kuruman Administrative District |
| <p>Distance and direction from nearest town</p> | <p>Farms Botha No 313 and Devon No 277 are ±20 km east of Hotazel when travelling along the R380 in a south-eastern direction.</p> <p>Farms Bermolli No 583, Engelsdraai No 221, Witdraai No 204, and Vaalwater No 84 are between 30 km and 60 km south-west of Postmasburg when driving along the R383 in a southern direction.</p> |
| <p>21 digit Surveyor General Code for each farm portion</p> | <ol style="list-style-type: none"> 1. C04100000000031300000 2. C04100000000031300001 3. C04100000000027700000 4. C04100000000027700001 5. C03100000000058300004 6. C03100000000058300005 7. C03100000000022100000 8. C03100000000022100001 9. C03100000000020400000 |

| | |
|--|---------------------------|
| | 10. C03100000000020400001 |
| | 11. C03100000000008400000 |
| | 12. C03100000000008400001 |
| | 13. C03100000000008400002 |

c) Locality map

(show nearest town, scale not smaller than 1:250000 as **Appendix 3**)

The requested map is presented in the form of the Regulation 42 Project Map compiled in terms of the Mining Titles Registration Act, 1967, and the Regulation 2.2 Project Map compiled in terms of the MPRDA respectively attached as Appendix 3.1 and 3.2 to this document.

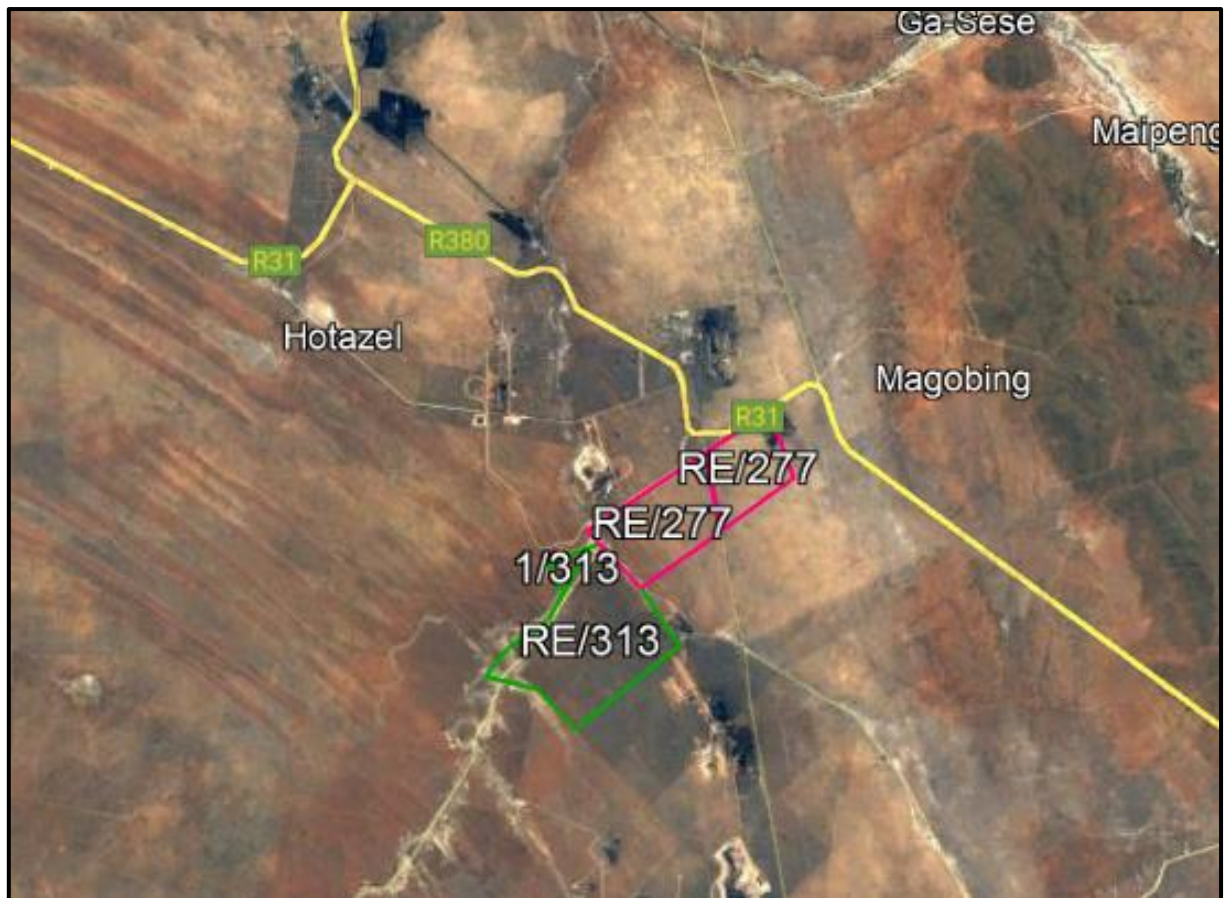


Figure 1: Satellite view showing the proposed prospecting right footprint over the farms Botha No 313 and Devon No 277. (Image obtained from Google Earth)

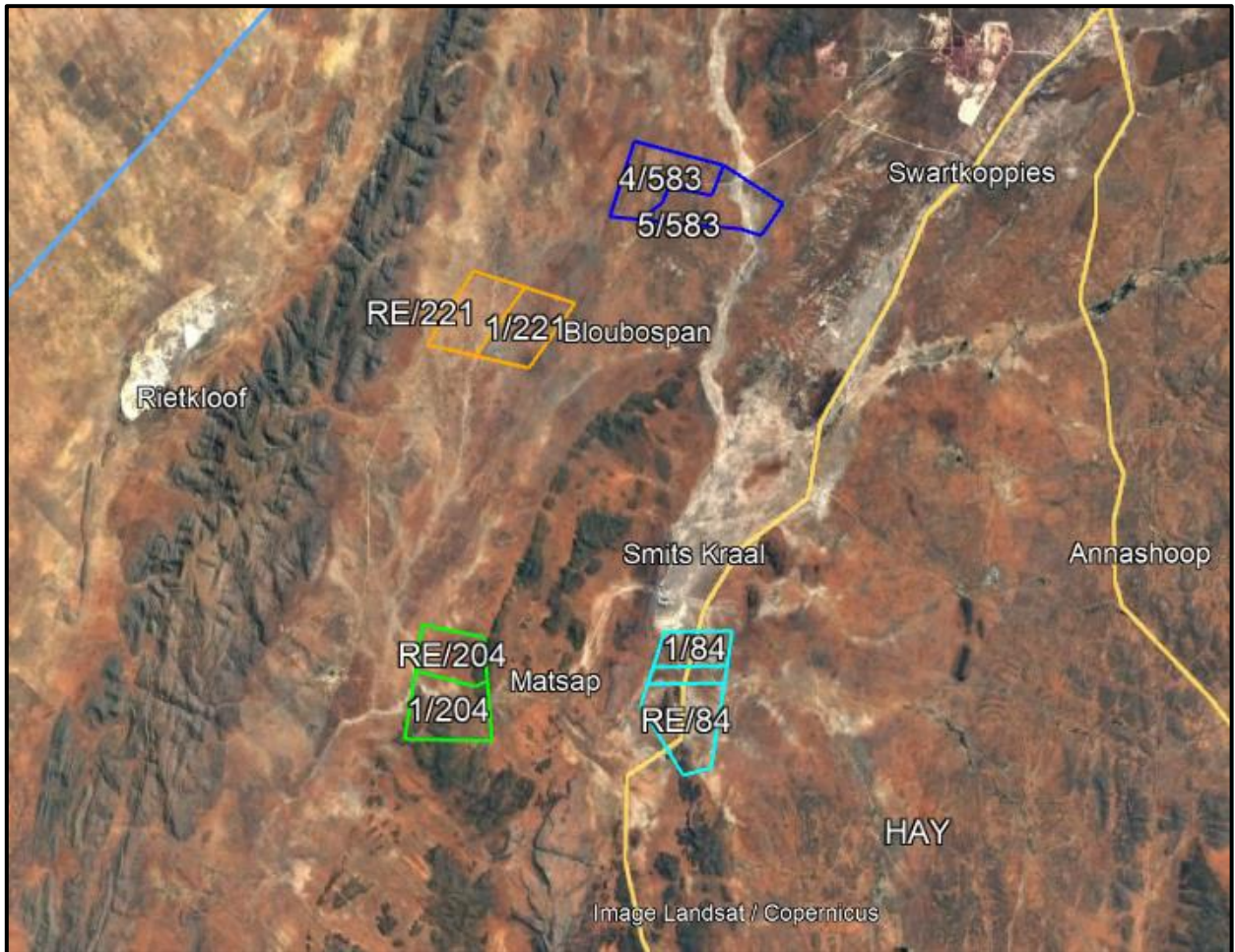


Figure 2: Satellite view showing the proposed prospecting right footprint over the farms Bermolli No 583, Engelsdraai No 221, Witdraai No 204, and Vaalwater No 84. (Image obtained from Google Earth)

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix 4**

The Applicant, K2022641005 (SOUTH AFRICA) (Pty) Ltd, applied for a prospecting right (PR) with bulk sampling, and environmental authorisation (EA) for diatomite ($\text{SiO}_2 \cdot n\text{H}_2\text{O}$) / diatomaceous earth / kieselguhr (hereafter referred to as kieselguhr) over 15 602.0765 ha that extends over the properties listed under (b) *Description of the Property* within the Hay and Kuruman Administrative Districts of the Northern Cape.

Should the relevant authorisations be granted, and the project commence the principal prospecting activities will entail the following:

- ❖ Non-Invasive Prospecting:
 - ◆ Desktop geological studies (Phase 1),
 - ◆ Geological field mapping (Phase 2),
 - ◆ Feasibility studies and target selection (Phase 4 & 6),

- ◆ Metallurgical Testing and Analysis (Phase 4),
- ❖ Invasive Prospecting (with bulk sampling):
 - ◆ Drilling and excavation of trenches, exploration pits and collecting of bulk samples (Phase 3 & 5),
 - ◆ Sloping, landscaping, and rehabilitation the affected areas (Phase 3 & 5).

The proposed project triggers listed activities (see following table) in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended) and therefore requires an environmental impact assessment (EIA) that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures in cooperation with specialists, to ultimately culminate in an environmental management programme (EMPR) that informs the competent authority (Department of Mineral Resources and Energy) when considering the environmental authorisation.

The site layout plan can only be compiled once the bulk sampling target areas were identified following the non-invasive prospecting phases. However, a schematic representation of the proposed prospecting activities are presented in this report under Figure 5, and the DEIAR will include a site sensitivity map highlighting areas where invasive prospecting is dissuaded.

Table 1: Listed and specified activities triggered by the proposed activities.

| NAME OF ACTIVITY <small>(All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)</small> | AERIAL EXTENT OF THE ACTIVITY Ha or m ² | LISTED ACTIVITY Mark with an X where applicable or affected. | APPLICABLE LISTING NOTICE (GNR 324, GNR 325 OR GNR 327)/NOT LISTED |
|---|--|--|--|
| Phase 1: Non-Invasive Prospecting: Desktop Geological Study: Literature Survey / Review (All Farms) | N/A: Non-invasive Prospecting | N/A | Not listed. |
| Phase 2: Non-Invasive Prospecting: Geological Field Mapping (All Farms) | N/A: Non-invasive Prospecting | | |

| NAME OF ACTIVITY | AERIAL EXTENT OF THE ACTIVITY | LISTED ACTIVITY | APPLICABLE LISTING NOTICE |
|--|--|-----------------|--|
| <p>Phase 3: Invasive Prospecting:</p> <p>Exploration pits and sampling, Slope, landscape, and rehabilitate the affected areas.</p> | <p>15 pits/trenches of 2 500 m² (62 500 m³)</p> <p>15 pits/trenches of 10 000 m² (300 000 m³)</p> <p>15 pits/trenches of 7 500 m² (187 500 m³)</p> | X | <ul style="list-style-type: none"> ❖ GNR 517 Listing Notice 1 Activity 20 (as amended) ❖ GNR 517 Listing Notice 2 Activity 19 (as amended) |
| <p>GNR 517 Listing Notice 1 Activity 20 (as amended):</p> <p><i>Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right.</i></p> | | | |
| <p>GNR 517 Listing Notice 2 Activity 19 (as amended):</p> <p><i>The removal and disposal of a mineral, which requires a permission ated in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the permission.</i></p> | | | |
| <p>Phase 4: Non-Invasive Prospecting:</p> <p>Geological Feasibility, Target Selection, Metallurgical Testing and Analysis.</p> | N/A: Non-invasive Prospecting | N/A | Not listed. |
| <p>Phase 5: Invasive Prospecting:</p> <p>Exploration pits and sampling, Slope, landscape, and rehabilitate the affected areas.</p> | <p>15 pits/trenches of 2 500 m² (62 500 m³)</p> <p>15 pits/trenches of 10 000 m² (300 000 m³)</p> <p>15 pits/trenches of 7 500 m² (187 500 m³)</p> | X | <ul style="list-style-type: none"> ❖ GNR 517 Listing Notice 1 Activity 20 (as amended) ❖ GNR 517 Listing Notice 2 Activity 19 (as amended) |
| <p>Phase 6: Non-Invasive Prospecting</p> <p>Analytical Desktop Pre-Feasibility Study.</p> <p>Feasibility Study and Mining Right Application (if applicable).</p> | N/A: Non-invasive Prospecting | N/A | Not listed. |

ii) Description of the activities to be undertaken

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

BACKGROUND INFORMATION:

(Information obtained from the article by Hobart M. King: *Diatomite; The sedimentary rock used as a filter, absorbent, filler, abrasive and more.* <https://geology.com/rocks/diatomite.shtml>)

Kieselguhr, diatomaceous earth and diatomite are the names commonly used for remarkably light, dull white or pale-coloured, massive to finely laminated chalky-looking, highly porous sediment composed mainly of the minute hollow opaline protective shells of unicellular aquatic plants known as diatoms.

Diatomite (kieselguhr) is a very porous rock with a fine particle size and a low specific gravity. These properties make it useful as a filter media, an absorbent, and as a lightweight filler for rubber, paint, and plastics. Crushed diatomite is usually called "diatomaceous earth".

Diatoms are members of a large, diverse group of algae that drift freely in the waters of oceans and lakes. A few types of diatoms live on the bottom of these water bodies and in soils. Most diatoms are microscopic, but a few species are up to two millimetres in length. As a group, diatoms are unique because they are single-celled organisms that produce an external cell wall composed of silica, called a frustule. These frustules are very thin and have a delicate structure. (H.M. King).

Dr King further notes that when diatoms die, their siliceous frustules sink. If the associated sediment is composed of over 30% diatom frustules by weight, it would be called a "diatom ooze" or a "siliceous ooze." These are the sediments that are lithified into the rock known as diatomite.



Figure 3: Images of white diatomite (first frame), and in the second frame diatomaceous earth that is crushed diatomite. (Images from geology.com)

According to the U.S. Geological Survey (USGS), the production of diatomite in the USA in 2022 was estimated to be 1.1 million tons. Approximately 55% of the diatomite is used in filtration products, while the remaining 45% is used in absorbents, fillers lightweight aggregates and other applications. Less than 1% is used for specialized pharmaceutical and biomedical purposes. The

amount of domestically produced diatomite sold or used by USA producers in 2022 was 10% higher than that in 2021. The United States remained the leading global producer and consumer of diatomite. Filtration (including the purification of beer, liquors, and wine and the cleansing of greases and oils) continued to be the leading end use for diatomite. An important application for diatomite is the removal of microbial contaminants, such as bacteria, protozoa, and viruses in public water systems. Domestically, diatomite used in the production of cement was the second-ranked use. Other applications for diatomite include filtration of human blood plasma, pharmaceutical processing, and use as a nontoxic insecticide (Crangle, RD [(703) 648-6410, rcrangle@usgs.gov]).

PROJECT PROPOSAL:

The Applicant applied for a prospecting right (PR) for kieselguhr over 15 602.0765 ha of the properties listed under (b) *Description of the Property*. The following table lists the GPS coordinates of the proposed prospecting area as shown on the Regulation 2(2) Project Plan attached as Appendix 3.2.

Table 2: GPS Coordinates of the proposed prospecting footprint.

| NUMBER | DEGREES, MINUTES, SECONDS | | DECIMAL DEGREES | |
|--------|---------------------------|--------------|-----------------|------------|
| | LAT (S) | LONG (E) | LAT (S) | LONG (E) |
| A | 27°13'31.18" | 22°59'27.07" | -27.225327° | 22.990852° |
| B | 27°14'43.45" | 22°59'57.15" | -27.245403° | 22.999209° |
| C | 27°16'43.26" | 22°56'51.27" | -27.278683° | 22.947575° |
| D | 27°17'46.13" | 22°57'37.70" | -27.296147° | 22.960471° |
| E | 27°19'16.82" | 22°55'30.37" | -27.321338° | 22.925102° |
| F | 27°18'33.13" | 22°54'44.87" | -27.309202° | 22.912464° |
| G | 27°18'18.37" | 22°53'40.54" | -27.305103° | 22.894594° |
| H | 27°17'48.10" | 22°54'07.19" | -27.296695° | 22.901997° |
| J | 27°17'15.40" | 22°54'57.90" | -27.28761° | 22.916082° |
| K | 27°16'42.75" | 22°55'18.62" | -27.278541° | 22.92184° |
| L | 27°16'42.73" | 22°55'07.54" | -27.278537° | 22.918762° |
| M | 27°16'16.44" | 22°54'56.97" | -27.271234° | 22.915825° |
| N | 27°15'59.34" | 22°55'46.17" | -27.266483° | 22.929491° |
| P | 27°15'40.10" | 22°55'46.44" | -27.261138° | 22.929568° |
| Q | 28°25'57.52" | 22°45'55.49" | -28.432645° | 22.765414° |
| R | 28°26'43.77" | 22°49'07.10" | -28.445493° | 22.818639° |
| S | 28°27'56.46" | 22°51'14.80" | -28.465682° | 22.854112° |
| T | 28°28'56.73" | 22°50'27.64" | -28.482424° | 22.84101° |
| U | 28°28'43.96" | 22°49'42.04" | -28.478879° | 22.828344° |
| V | 28°25'38.29" | 22°45'02.11" | -28.472303° | 22.750587° |
| W | 28°30'09.44" | 22°40'02.49" | -28.502623° | 22.667358° |
| X | 28°31'04.47" | 22°43'45.64" | -28.517907° | 22.729344° |
| Y | 28°33'05.42" | 22°42'04.99" | -28.551506° | 22.701385° |
| Z | 28°32'20.74" | 22°38'27.75" | -28.539094° | 22.641042° |
| 1A | 28°41'11.73" | 22°38'12.14" | -28.686593° | 22.636705° |

| NUMBER | DEGREES, MINUTES, SECONDS | | DECIMAL DEGREES | |
|--------|---------------------------|--------------|-----------------|------------|
| | LAT (S) | LONG (E) | LAT (S) | LONG (E) |
| 1B | 28°41'35.15" | 22°40'26.40" | -28.693097° | 22.673999° |
| 1C | 28°44'51.26" | 22°40'39.46" | -28.747572° | 22.677628° |
| 1D | 28°44'47.89" | 22°37'32.40" | -28.746637° | 22.625668° |
| 1E | 28°41'25.86" | 22°46'55.75" | -28.690518° | 22.782153° |
| 1F | 28°41'25.06" | 22°49'19.54" | -28.690294° | 22.822095° |
| 1G | 28°45'47.24" | 22°48'34.62" | -28.763123° | 22.809618° |
| 1H | 28°46'00.53" | 22°47'33.77" | -28.766814° | 22.792715° |
| 1J | 28°43'44.94" | 22°46'02.74" | -28.72915° | 22.767429° |

Also refer to Figure 1 and 2 above for satellite images of the proposed prospecting area in relation to the surrounding landscape.

Should the PR be issued, and the activities be allowed, the proposed project will comprise of six phases that can be divided into non-invasive- and invasive prospecting as presented in the following table.

Table 3: Proposed prospecting activities to be implemented.

| PHASE | ACTIVITY | SKILL(S) REQUIRED | TIMEFRAME | OUTCOME |
|-------|---|--|-------------|--|
| 1 | Non-Invasive Prospecting Desktop Geological Study: Literature Survey / Review (All Farms) | Geologist | Month 1-6 | Initial geological targeting report supported by historical records and existing data. |
| 2 | Non-Invasive Prospecting Geological Field Mapping (All Farms) | Geologist & Field Crew | Month 6-12 | Detailed geological targeting report accompanied by maps & plans of ground truthing of initial geological targeting. |
| 3 | Invasive Prospecting Exploration pits and sampling Phase 1 – Bulk Sampling 50 000 m ³ @ density of 2.25 | Geologist / Excavator Team / Field Crew / Laboratory Technicians | Month 12-36 | Exploration pit data: lithological logs, geophysical exploration pit surveys, assay results for mineralized intercepts. Modelling of data. Interpretation and 3D modelling of potential deposits. Generation and ranking of mineralized targets. |
| 4 | Non-Invasive Prospecting Geological Feasibility Target Selection Metallurgical Testing | Geologist / Laboratory Technicians / Metallurgical Specialists | Month 36-42 | Borehole data & RAB data: lithological logs, geophysical down hole surveys, assay results for mineralized intercepts, results for metallurgical testing and analysis. |

| PHASE | ACTIVITY | SKILL(S) REQUIRED | TIMEFRAME | OUTCOME |
|-------|---|--|-------------|--|
| | and Analysis | | | |
| 5 | Invasive Prospecting Exploration pits and sampling Phase 2 Bulk Sampling 50 000 m ³ @ density 2.25 | Geologist / Excavator Team / Field Crew / Laboratory Technicians | Month 36-54 | Exploration pit data: lithological logs, geophysical exploration pit surveys, assay results for mineralized intercepts. Modelling of data. Interpretation and 3D modelling of potential deposits. Generation and ranking of mineralized targets. Resource estimation work producing a SAMREC Mineral Resource. |
| 6 | Non-Invasive Prospecting Analytical Desktop Pre-Feasibility Study. Feasibility Study and Mining Right Application. | Economic Geologist / Mining Engineer / Project Engineer / Consulting Company | Month 54-60 | Geological and pre-feasibility reports, maps, and plans. Risk assessment study to determine if a full feasibility is warranted. |

Invasive Prospecting (with bulk sampling):

(1) Site Commencement/Establishment Phase

Once the target areas were identified (during non-invasive prospecting) and the invasive prospecting commences (phase 3 & 5), site commencement/establishment will entail discussions with the landowners regarding access to the properties, the clearance of vegetation (where necessary) from the areas to be sampled, the stripping and stockpiling of the topsoil (where applicable), and the introduction of the prospecting equipment as detailed below:

❖ **Clearing of Vegetation**

The proposed footprint of a typical drill site will be ±200 m² in size, while a bulk sampling site will be between 2 500 m² (0.25 ha) and 10 000 m² (1 ha) as stated in Table 4. The prospecting contractor will need to remove the vegetation cover from the largest part of the earmarked area to allow the sampling activities. The vegetation cover will only be removed from the exact area to be prospected and immediately prior to commencement, no blanket clearing will be allowed. The plant material that will be removed will be stockpiled with the topsoil (if any) to be returned during the rehabilitation of the area.

The draft environmental impact assessment report (DEIAR) that will follow the approval of this report (Scoping Report) will assess the site specific land use, fauna and flora of the study area as part of the EIA process. The flora-part of the assessment will inform on the occurrence of possible endangered plant communities and red data plant species, identify areas of concern to be excluded from the prospecting footprint, instruct on the management of red data species, identify the presence and distribution of threatened plants, determine the impact that the proposed activity may have on the conservation status of natural vegetation, and propose management and mitigation measures for identified impacts. The intention is to minimize the removal of natural vegetation, and to in the end restore the footprint area to land suitable for continued agricultural or mining use whichever where applicable prior to prospecting.

❖ **Topsoil Stripping**

Although kieselguhr usually extends up to surface level, it is proposed that any available topsoil in the earmarked areas will be stripped and stockpiled for the duration of the activities. Topsoil removal will be restricted to the exact footprint of each prospecting site during the invasive phases of the activity. The topsoil will be stockpiled at a designated signposted area to be replaced during the rehabilitation of the area. It will be the responsibility of site management to prevent the mixing of topsoil heaps with overburden/other soil heaps. The complete A-horizon (the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed when present. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped. The topsoil berm will measure a maximum of 2 m in height to preserve micro-organisms within the topsoil.

❖ **Access Roads**

Access to the prospecting areas will, as far as possible, follow the existing internal farm roads. The farm roads will be upgraded where necessary to allow the comfortable movement of the prospecting machinery/vehicles. Where needed jeep-tracks will be opened from the main farm road to the specific prospecting sites in agreement with the landowners. These tracks will be temporary and will be rehabilitated once prospecting ceases and if the landowner do not wish the track to remain. The jeep-track route will as far as possible avoid sensitive vegetated areas (to be identified by an ecologist), watercourses, and cultivated area and must be approved by the ECO prior to use. Presently the maximum width of a track is expected to be ± 5 m.

❖ Establishment of Site Equipment/Infrastructure

The prospecting activities does not require the use of any permanent equipment/infrastructure. A central site camp (with an approximate footprint of 3 ha) will be established at an area agreed to by each landowner where mobile containers will be used as office space and for storage. Chemical ablutions will be established, and the site camp will be fenced to control access. No bulk storage of fuel (>30 000 l) will be necessary. All chemicals/hydrocarbons will be kept in the storage containers or bunded areas with impermeable surfaces.

Presently, it is proposed that a typical drill site will entail the following:

- ◆ Drill rig,
- ◆ Sample laydown area,
- ◆ Water evaporation sump,
- ◆ Chemical toilet,
- ◆ Refuse bins and bunded area for applicable chemicals.

A typical bulk sampling site will entail the following:

- ◆ Site camp with approximately three container offices, a generator, and a 5 000 l fuel bowser,
- ◆ Earthmoving equipment including a 30 ton excavator, two front-end-loaders (FEL) and a 30 ton tipper truck,
- ◆ Crushing and milling plant to size the samples,
- ◆ Tipper trucks transporting samples,
- ◆ Chemical toilet,
- ◆ Refuse bins and bunded area for applicable chemical storage.

(2) Operational Phase (Trenching and Sampling Pits)

The targeting of all drilling and/or trenching activities will be dependent on the results obtained during the preceding non-invasive phases of prospecting, namely geological mapping. As such it is currently not possible to include a finalized surface plan showing the intended location, extent, and depth of boreholes/exploration pits to be prospected.

The initial planned invasive exploration activities will consist of exploration drilling, trenches, and pits to appropriate depths to target anomalies and testable material identified during Phases 1 & 2 of the non-invasive prospecting. Down the hole geophysical surveying will take place upon completion of the exploratory trenching and pits along with ground surveys to determine positions of geological materials.

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DRAFT SCOPING REPORT**



The work will consist of:

- ◆ Trenching and sample pits,
- ◆ Sampling and assaying,
- ◆ Quality assurance and quality control programs,
- ◆ Metallurgical test work,
- ◆ Rehabilitation of drill and trenching/pit sites, and
- ◆ Recording and integration of data.

The following table describes the bulk sampling activities to be undertaken.

Table 4: Bulk Sampling Activities.

| ACTIVITY | | DETAILS | | |
|--|-------------------------|------------------------|--------|-------|
| Number of pits/trenches planned | | ±90 | | |
| Dimensions of pits/trenches, per pit/trench | Number of pits/trenches | Length | Breath | Depth |
| | 30 | 50 m | 50 m | 25 m |
| | 30 | 100 m | 100 m | 30 m |
| | 30 | 150 m | 50 m | 25 m |
| Volume Overburden (Waste) | | 30 000 m ³ | | |
| Volume Ore | | 100 000 m ³ | | |
| Density Overburden | | 1.68 | | |
| Density Ore | | 2.25 | | |
| Phase(s) when bulk sampling will be required | | Phases 3 & 5 | | |
| Timeframe(s) | | Months 12 - 54 | | |



Figure 4: Example of a typical drill site.

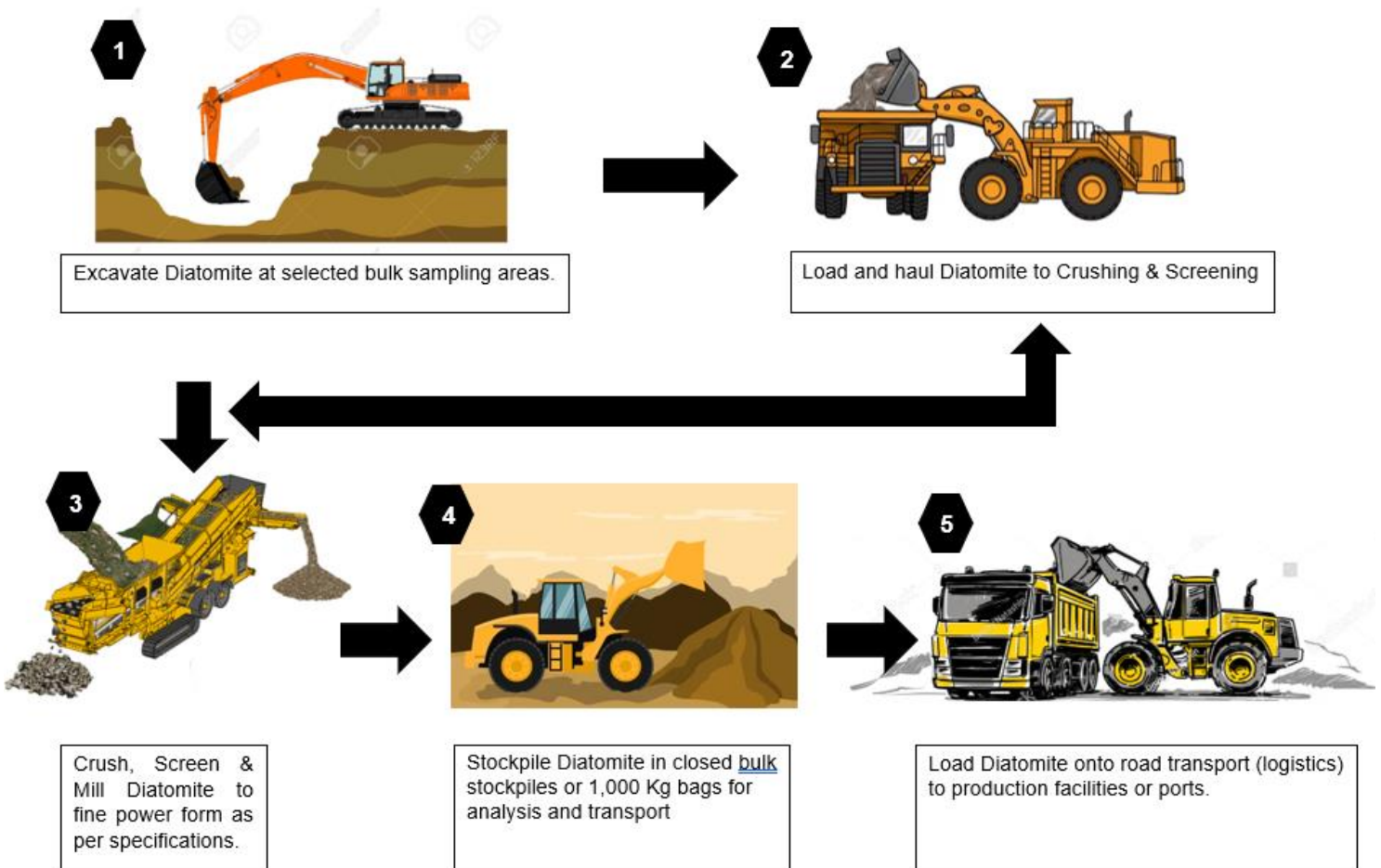


Figure 5: Schematic diatomite bulk sampling flow diagram.

❖ **Assaying:**

Rock chip / soil samples will be sent to a laboratory of the Applicant's choice (off-site) to be crushed, split, pulverized, and assayed. Samples from the drill cores will be split using a core cutter before it is sent to the laboratory for analysis.

❖ **Metallurgical Test Work:**

Metallurgical test work will start during Phase 4 of the prospecting activities. These tests will be done off-site by and in consultation with a preferred and accredited Laboratory of the Applicant's choice. No metallurgical work will be done at the prospecting areas and/or site camp.

❖ **Electricity Need**

The prospecting activities does not require electricity as all equipment will be powered with generators.

❖ **Water Use**

The drilling operation requires $\pm 1\ 000$ l of water day while the bulk sampling activities will necessitate $\pm 10\ 000$ l/day. Water will also be used for dust suppression at the prospecting sites and access roads. Potable water will daily be transported to site by the employees, while the process water will be bought from a local sources (to be identified) in the vicinity of the prospecting activities and transported to site in a water truck(s).

❖ **Waste Handling**

Due to the nature of the project, the small scale of each prospecting site, and the fact that maintenance work will be done off-site, very little general waste will be generated as a direct result of the prospecting activities. All the general waste generated at the prospecting sites will be transported to the site camp where it will be contained in refuse bins. Once full the refuse bins will be emptied, and the waste will be disposed of at a registered landfill site in the vicinity of the project. Proof of safe disposal will be filed for auditing purposes.

Hazardous waste will mainly be the result of accidental spillages or breakdowns. Such contaminated areas will be cleaned up immediately (within two hours of the occurrence) and the contaminated soil will be contained in designated hazardous waste containers to be removed daily to the hazardous waste storage area at the site camp. A registered contractor will be appointed to collect and dispose of the hazardous waste at a registered hazardous waste handling facility and the site will file the proof of safe disposal for auditing purposes.

The chemical toilets will weekly be serviced by an appropriately qualified sewerage handling contractor who will furnish the site with proof of safe disposal.

❖ **Traffic Requirements**

The prospecting operations will daily be visited by approximately ten (10) vehicles. The bulk sampling activities will require approximately four 30 ton flatbed trucks to transport the material from the farm to the port, Johannesburg, or various other production facilities.

❖ **Servicing and Maintenance**

No workshop, wash bay or service areas will be established at the prospecting sites and/or site camp. When needed maintenance/servicing of the equipment will be performed at the contractor's off-site workshop.

(3) Decommissioning phase

Rehabilitation will include activities that can be divided into medium- and long term categories. In the medium term, rehabilitation will entail the continuous reinstatement of prospected areas, and the management of invasive plant species and/or erosion. In the long term, rehabilitation will involve the reinstatement of the remaining disturbed areas (not yet reinstated), prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE). The PR holder will further be responsible for the seeding of all rehabilitated areas should vegetation not establish through succession within the first six months.

At this stage the following baseline rehabilitation actions are proposed from which a detailed Closure Plan will be developed (to be approved as part of the EIA process):

- ❖ Rehabilitation of all the disturbed surface areas shall entail landscaping, levelling, sloping, top dressing, land preparation, seeding (if required), and invasive plant clearing.
- ❖ All unwanted infrastructures, equipment, and other items used during the prospecting period will be removed from the site in accordance with section 44 of the MPRDA, 2002.
- ❖ Waste material of any description, including receptacles, scrap, rubble, and tyres, will be removed entirely from the prospecting area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- ❖ The rehabilitation area will be cleared of invader plant species. Priority will be given to species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto).

Once the full prospecting area was rehabilitated the PR holder is required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002 that states: *“An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of*

the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the prescribed environmental risk report". The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998.

e) Policy and Legislative Context

Table 5: Applicable legislation and guidelines used to compile the report.

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process). | REFERENCE WHERE APPLIED |
|--|--|
| Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). | Assessment of biophysical environment and current land use. |
| Guideline on Need and Desirability | The need and desirability of the project was assessed in accordance with these guidelines. |
| Mine Health and Safety Act, 1996 (Act No. 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations. | The mitigation measures proposed for the site consider the MHSA, 1996. |
| Section 16 and 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) read together with applicable amendments and regulations thereto. | Application for a prospecting right. Reference number: NC30/5/1/1/2/13826PR |
| National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended): ❖ GNR 517 Listing Notice 1 Activity 20 (as amended) ❖ GNR 517 Listing Notice 2 Activity 19 (as amended) | Application for environmental authorisation. Reference number: NC30/5/1/1/2/13826PR |
| National Environmental Management: Air Quality Control Act, 2004 (Act No. 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827. | The mitigation measures proposed for the project consider the NEM:AQA, 2004 and the National Dust Control Regulations. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
|---|---|
| National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto. | Assessment of biophysical environment. |
| National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 9260). | The mitigation measures proposed for the site consider the NEM:WA. |
| National Heritage Resources Act, 1999 (Act No. 25 of 1999) | Assessment of the cultural and heritage environment. |
| National Road Traffic Act, 1996 (Act No. 93 of 1996) | The mitigation measures proposed for the project consider the NRTA, 1996. |
| National Water Act, 1998 (Act No. 36 of 1998) read together with applicable amendments and regulations thereto. Department of Water Affairs and Forestry Best Practice Guideline Series (2007). | Prospecting within proximity to watercourses may require a water use authorisation in terms of Section 39 of the NWA, 1998 for water uses as defined in section 21 of the Act. Once the prospecting plan was finalised, the Applicant will enter discussions with the DWS to determine the relevant requirements. |
| Public Participation Guideline in terms of the NEMA EIA Regulations. | The guidelines were used during the public participation process. |
| The South African Constitution. | To be upheld throughout the EIA assessment, planning-, construction-, operational- and decommissioning phases. |

f) Need and desirability of the proposed activities.

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

As mentioned earlier, kieselguhr is a highly sought after mineral in the absorbent, cement, filtration, medical, and other industries. Other uses of kieselguhr include animal feed applications, natural dewormer for animals, insect, and ant killer. Kieselguhr also has wide application for an anti-caking agent in grain storage as well as mixed feeds.

❖ Filter Media

Kieselguhr is used at drinking water treatment plants, swimming pools, breweries, wineries, chemical plants, and where juices and syrups are made. These fluids are forced through a layer of wet diatomaceous earth, and suspended particles are trapped because it cannot fit through the pores.

❖ Cement Additive

Kieselguhr is often used as an additive in the manufacture of portland cement. High-quality kieselguhr contains over 80% silica, and it is added to the cement-making process to boost the silica content of the product.

❖ Filler

Diatomaceous earth is used as a lightweight, inert filler in some manufactured products. It is added to paint as a whitening agent and extender. It is added to plastics as a lightweight filler. It is used as a filler and anti-stick agent in asphalt shingles and to improve adhesion resistance in many rubber products.

❖ Absorbent

If dry diatomaceous earth is placed on a liquid spill, it can absorb and hold an amount of liquid equivalent to its own weight. This absorption facilitates containment, cleanup, and removal. These same properties make diatomaceous earth able to absorb skin oils when used in cosmetics and facial masks. Diatomaceous earth is an absorbent ingredient of some kitty litters. It is also used as a soil treatment to absorb and hold water.

❖ Mild Abrasive

Diatomaceous earth is used as a mild abrasive in some toothpastes, facial scrubs, and metal polishes. Its silica particles are small, friable, have a high surface area, and are angular in shape. These are properties that help it perform well as a mild abrasive.

❖ Gardening

Diatomaceous earth is used as a growing medium in hydroponic gardens. It is inert, holds water, and has a porosity that allows the soil to breathe. To help grain and other seeds from sticking together and remain dry, they are dusted with diatomaceous earth.

❖ Insect and Slug Control

Diatomaceous earth is an abrasive and an absorbent. These properties make it effective in controlling slugs and certain insects.

❖ Flea and Tick Control

Dogs and cats can be treated with food-grade diatomaceous earth to control fleas and ticks.

Within the Griqualand West area, kieselguhr appear to overlay either lava of the Ongeluk Sub-Group, or Dwyka shale (Base Kalahari Formation) along ancient water courses and paleo-marshes. This prospecting right application intends to identify feasible kieselguhr sources in the Northern Cape that can economically be exploited and contribute to the economy of the region.

The proposed labour component of the proposed project will be ±15 to 20 labourers that will be hired from the local communities.

The need and desirability of the proposed operation was assessed in terms of the National Department of Environmental Affairs' Guideline on Need and Desirability (first version published in terms of section 24J of the NEMA in 2014, and second version in 2017). The following table shows the questions that were considered in this regard.

Table 6: Need and desirability determination.

| 1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES | | |
|--|---|--|
| <u>How will this development impact on the ecological integrity of the area?</u> | | |
| Question | Response | Level of Desirability |
| How were ecological integrity considerations considered? | <p>As discussed under Heading 2(h)(iv)(1)(a) <i>Type of environment affected by the proposed activity</i>, the DFFE Screening Report indicates various ESA and CBA's over the earmarked properties. Various watercourses cross the properties and pans occur on especially Vaalwater No 84. The farms Bermolli No 583 and Engelsdraai No 221 are within FEPA's. The vegetation types of the study area include at least seven different types all of which have a conservation status of Least Threatened.</p> <p>Presently, the vegetation of the farms are intact and natural to near natural except for some previously mined areas and the developed farmyards. The DEIAR will assess the fauna and flora of the study area as part of the EIA process. The flora-part of the assessment will consider the various plant communities, inform on the occurrence of endangered plant communities and red data plant species, identify areas of concern to be excluded from the prospecting footprint, instruct on the management of red data species, identify the presence and distribution of threatened plants present in the study area, determine the impact that the proposed activity will have on the conservation status of natural vegetation, and propose management and mitigation measures for identified impacts. The intention is to minimize the removal of natural vegetation, and to in the end restore the footprint area to land suitable for agricultural purposes upon closure of each sampling site.</p> | Need and desirability to be defined during the following EIAR phase. |
| How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? | | |
| How will this development pollute and/or degrade the biophysical environment? | Due to the small scale and nature of the proposed activity the pollution potential is of low significance. The prospecting method proposes continued reinstatement of the prospected areas, thereby keeping the impact on the receiving environment as low as possible. The potential of the proposed activity degrading the biophysical environment will be determined once the findings of the specialists were received. | |
| What waste will be generated by this development? | <p>Due to the nature of the project, very little general waste is expected to be generated as a direct result of the prospecting activities. The general waste will mainly consist of paper, plastic, glass, metal and potentially tin that will be contained in sealable refuse bins at the site camp from where it will be removed to a registered landfill site when the capacity of the containers is reached.</p> <p>Likewise, very little generation of hazardous waste is expected. Hazardous waste will mainly be the result of accidental spillages/breakdowns. The hazardous waste to be generated will be kept in designated hazardous waste containers to be removed from the site by a registered hazardous waste handling contractor.</p> | Highly Desirable |

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES

How will this development impact on the ecological integrity of the area?

| Question | Response | Level of Desirability |
|---|--|---|
| | <p>Chemical ablation facilities will be available to the employees that will weekly be serviced by a registered contractor.</p> <p>No waste will be disposed of or treated on the farms.</p> | |
| <p>How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?</p> | <p>An archaeologist and palaeontologist will be appointed to assess the cultural importance of the proposed areas. The findings of the specialist study will be incorporated into the DEIAR.</p> | <p>Need and desirability to be defined during the following EIAR phase.</p> |
| <p>How will this development use and/or impact on non-renewable natural resources?</p> | <p>The Applicant proposes to collect ±100 000 m³ of kieselguhr samples across the entire 15 602 ha application area. Considering this, the potential impact of the proposed activity on non-renewable natural resources is deemed negligible.</p> | <p>Highly Desirable</p> |
| <p>How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?</p> | <p>The proposed activity will make use of generators to power the site infrastructure and obtain water from legal sources. The water will mainly be needed for dust suppression purposes and a maximum use of 10 000 l/day is anticipated.</p> | <p>Highly Desirable</p> |
| <p>How were a risk-averse and cautious approach applied in terms of ecological impacts?</p> | <p>The findings of the specialists will be assessed during the EIA phase and if needed alternatives will be considered to minimise the impact of the activity on biological sensitive areas.</p> | <p>Need and desirability to be defined during the following EIAR phase.</p> |
| <p>How will the ecological impacts resulting from this development impact on people's environmental right?</p> | <p>The proposed activity will be managed in accordance with the agricultural practices of the farms and/or other land uses. As mentioned in Heading 3(j)(1) <i>Impact on the socio-economic condition of any directly affected person</i>, the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect</p> | |



1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES

How will this development impact on the ecological integrity of the area?

| Question | Response | Level of Desirability |
|---|--|--|
| | air quality and possibly the noise ambiance of the study area. The degree and significance of the listed impacts will be assessed during the following EIA phase. By nature these impacts require constant monitoring to be implemented throughout the operational-, and decommissioning phases of the project. | |
| Describe the linkages and dependencies between human wellbeing, livelihoods, and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts. | The Applicant is in discussions with the landowners of the earmarked properties. As mentioned earlier, the potential impact of the proposed activity on the receiving environment will be assessed, as well as any other impacts to be identified during the EIA phase. Further to this, the landowners will be compensated for the use of their properties, and the mine intends to employ between 15 and 20 residents from the community. | Need and desirability to be defined during the following EIAR phase. |
| Based on all the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area? | The findings of the specialists will be assessed and if needed various alternatives will be considered to minimise the impact of the activity on biological sensitive areas. These findings will be collated into the draft EIAR that will be distributed for public perusal and commenting. Following the commenting period, the project proposal will be finalised. | Need and desirability to be defined during the following EIAR phase. |
| Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified, resulted in the selection of the "best practicable environmental option" in terms of ecological considerations | | |

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

What is the socio-economic context of the area?

| Question | Response | Level of Desirability |
|---|---|--|
| What is the socio-economic context of the area? | Please refer to Heading 2(h)(iv)(1)(a) Socio-economic Environment. | Highly Desirable |
| Considering the socio-economic context, what will the socio-economic impacts be of the development, and specifically also on the socio-economic objectives of the area? | <p>As mentioned in Heading 3(j)(1) <i>Impact on the socio-economic condition of any directly affected person</i>, the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect air quality and possibly the noise ambiance of the study area. The degree and significance of the listed impacts will be assessed during the following EIA phase.</p> <p>If the PR application is approved, the Applicant entered a partnership with an international company for the metallurgical testing of the kieselguhr samples and should the results be favourable the project may lead to a mining right application that could establish South Africa in the international kieselguhr market.</p> <p>The project will further contribute directly to the greater society through the employment of 15 to 20 residents as well as compensating the landowners for the use of their land.</p> | Highly Desirable |
| How will this development address the specific physical, psychological, developmental, cultural, and social needs and interests of the relevant communities? | <p>The project proposes prospecting activities to determine kieselguhr resources in the Hay and Kuruman Districts. The potential impact of the proposed activity on the physical, psychological, cultural, or social needs of the community will be assessed as part of the following EIA phase.</p> <p>Also refer to the discussion under Heading 2(k) <i>The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.</i></p> | Need and desirability to be defined during the following EIAR phase. |
| Will the development result in equitable impact distribution, in the short- and long-term? | The Applicant intends to employ 15 to 20 people from the local community for the duration of the prospecting right (±5 years). This is of crucial importance in municipal areas with very high unemployment rates. | Highly Desirable |

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

What is the socio-economic context of the area?

| Question | Response | Level of Desirability |
|--|--|--|
| In terms of location, describe how the placement of the proposed development will contribute to the area. | The project was initiated to identify the kieselguhr resources in the earmarked area. As mentioned earlier, positive outcomes could contribute to the export of kieselguhr from South Africa. Due to the nature of invasive prospecting activities, the location of drill holes and sampling sites can to a certain extent be moved to avoid structures and/or sensitive areas where possible. The landowners will also be compensated for the use of their land. | Highly Desirable |
| How were a risk-averse and cautious approach applied in terms of socio-economic impacts? | The mitigation measures proposed in this report, but more importantly those of the final EIAR and EMPR (to be drafted), are compiled in consultation with the specialists to reduce the potential impact that the proposed activity may have on the receiving environment. Once approved, the management outcomes are legally binding, and to be implemented by site management for the duration of the site establishment-, operational- and decommissioning phases. | Desirable |
| How will the socio-economic impacts resulting from this development impact on people's environmental right? | As mentioned in Heading 3(j)(1) <i>Impact on the socio-economic condition of any directly affected person</i> , the activity may have an impact on the visual characteristics of the surrounding environment and may potentially affect air quality and possibly the noise ambiance of the study area. The degree and significance of the listed impacts will be assessed during the following EIAR phase. By nature these impacts require constant monitoring to be implemented throughout the operational-, and decommissioning phases of the project. | Need and desirability to be defined during the following EIAR phase. |
| Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts? | <p>The Applicant is in discussions with the landowners of the earmarked properties. As mentioned earlier, the potential impact of the proposed activity on the receiving environment will be assessed, as well as any other impacts to be identified during the EIA phase.</p> <p>Further to this, the landowners will be compensated for the use of their properties, and the mine intends to employ 15 - 20 residents from the community.</p> | Need and desirability to be defined during the following EIAR phase. |

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

What is the socio-economic context of the area?

| Question | Response | Level of Desirability |
|---|---|-----------------------|
| <p>What measures were taken to pursue the selection of the “best practicable environmental option” in terms of socio-economic considerations?</p> | <p>The findings of the specialists will be assessed, and if needed various alternatives will be considered to minimise the impact of the activity on biophysical/culturally sensitive areas. These findings will be collated in the draft EIAR that will be distributed for public perusal and commenting. Following the commenting period, the project proposal will be finalised.</p> | |
| <p>What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons?</p> | | |
| <p>What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?</p> | <p>Prospecting will operate in accordance with, amongst others, the following:</p> <ul style="list-style-type: none"> ❖ CARA, 1983 – to ensure agriculture related compliance; ❖ Financial Provision Regulations, 2015 – to ensure compliance in terms of rehabilitation; ❖ Mine Health and Safety Act, 1996 (as amended) – to ensure employee safety; ❖ MPRDA, 2002 (as amended) – to ensure prospecting related compliance; ❖ NEM:AQA, 2004 – to ensure air quality related compliance; ❖ NEM:BA, 2004 – to ensure biodiversity related compliance; ❖ NEM:WA, 2008 – to ensure waste related compliance; ❖ NEMA, 1998 (as amended) – to ensure environmental related compliance; <p>Should the proposed application be approved the prospecting areas will also be subject to compliance with the above listed.</p> | Highly Desirable |
| <p>What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development’s life cycle?</p> | | |

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

What is the socio-economic context of the area?

| Question | Response | Level of Desirability |
|--|---|-------------------------|
| <p>Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community that is consistent with the priority needs of the local area.</p> | <p>The Northern Cape is well known for its rich mineral deposits. Prospecting for kieselguhr will contribute to the mineral wealth of the province and could assist landowners to extend the land use of their properties.</p> | <p>Highly Desirable</p> |
| <p>What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected.</p> | <p>The activities must operate in accordance with the specifications of the Mine Health and Safety Act, 1996 (MHSA). Site management will have daily discussions with the staff regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the daily site meetings. The MHSA further requires the submission of quarterly occupational hygiene reports that record site specific occupational hygiene exposure assessments.</p> | <p>Highly Desirable</p> |
| <p>Describe how the development will impact on job creation in terms of, amongst other aspects?</p> | <p>The Applicant intends to appoint 15 - 20 employees should the project advance to the invasive prospecting phases. These employees will be sourced from the local community.</p> | <p>Highly Desirable</p> |
| <p>What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage.</p> | <p>The proposed activity will operate under a valid environmental authorisation and prospecting right to be issued by the DMRE-NC. Compliance of the site with the approved EMPR and EA conditions will be reported on as per departmental specification. Considering this, the proposed activity will take place in an environmentally sustainable manner with the least possible impact on the receiving environment.</p> | <p>Highly Desirable</p> |

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT

What is the socio-economic context of the area?

| Question | Response | Level of Desirability |
|--|---|--|
| Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left. | It is believed that the preliminary list of mitigation measures proposed in this document is realistic and can be implemented (when needed). Should the prospected areas be rehabilitated successfully, no long-term management burden will be left behind. | Highly Desirable |
| What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution environmental damage or adverse health effects will be paid for by those responsible for harming the environment. | In terms of Section 41 of the MPRDA, 2002 a prospecting right holder must submit a financial provision to the DMRE that is sufficient to rehabilitate or manage the negative environmental impacts related to the activity. Upon approval of this application, the Applicant will lodge a financial guarantee with the DMRE that will be deemed sufficient to cover the financial provision amount needed to rehabilitate the affected areas. The environmental liability of the operation will annually be reviewed and if a shortfall is indicated, the guarantee will be accordingly adjusted. | Highly Desirable |
| Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified, resulted in the selection of the best practicable environmental option in terms of socio-economic considerations | The findings of the specialists will be assessed and if needed various alternatives will be proposed to minimise the impact of the activity on biophysical sensitive areas. These findings will be collated in the draft EIAR that will be distributed for public perusal and commenting. Following the commenting period, the project proposal will be finalised. | Need and desirability to be defined during the following EIAR phase. |
| Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area. | | |

g) Period for which the environmental authorization is required.

The Applicant requests that the Environmental Authorisation (EA) be valid for at least the duration of the prospecting right.

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

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

i) Details of all alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

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

e) The property on which, or location where, it is proposed to undertake the activity.

Presently, the project proposal entails the prospecting of 15 602.0765 ha area over the properties listed in section *b) Description of the Property* and presented in Figures 1 and 2.

Applicants can only apply for prospecting rights within areas where such rights are not yet held by other companies/applicants. Furthermore, the prospecting activities are dependent upon the presence of the desired minerals which are again dependent upon geological formations. As the intention of the proposed prospecting operations is to determine the presence of economically viable kieselguhr deposits in the Northern Cape, an area known/expected to contain these resources needs to be selected. Within the Griqualand West area, the diatoms appear to overlay either lava of the Ongeluk Sub-Group, or Dwyka shale (Base Kalahari Formation) along ancient water courses and paleo-marshes. The lava of the Ongeluk Sub-Group covers a substantial area along the Ongeluk-Witwater and Demoten synclines. The rock formation is also present along a thrust nape to the west of the Maremane dome.

The proposed footprint of the PR application was based on the available geological information which is of interest to kieselguhr. No further location/site alternatives are considered in the Scoping and EIA process.

f) Type of activity to be undertaken

The proposed activity entails prospecting with bulk sampling. Presently it is proposed that prospecting will be conducted using a combination of non-invasive and invasive activities. The invasive prospecting will include drilling and trenching that will entail the collection of large samples ($\pm 50\,000\text{ m}^3$ per phase) that constitutes bulk sampling. The proposed bulk sampling methods have been developed over many years by the mining industry and are the preferred method for resource estimation. These methods cannot easily be replaced by other methods.

The only other alternative would be to prospect the area without bulk sampling. However, the Applicant entered a partnership with an international firm regarding the testing of the kieselguhr samples for metallurgical and production compatibility with their production plants. The company requires bulk samples of at least 20 000 ton (per sample) to facilitate the metallurgical and production compatibility testing. Should bulk sampling be excluded from the project proposal the prospect of a possible international market for South African kieselguhr (should a mining right be considered) will remain unexploited. Further to this, kieselguhr has varying qualities and thus the samples must be distributed to a wide range of prospective clients from cement manufactures, paint manufacturers, filtration specialists etc that requires the collection of large samples.

g) Design and layout of the activity.

The Applicant indicated that sensitive areas and areas of conservation importance will be avoided by the proposed activities. The preferred drilling, trenching and pitting locations will be determined following the outcome of phases 1 & 2 and the mapping of geological survey data. The EIAR will include a list of areas (identified by specialists) that must be avoided and where no prospecting may be allowed. This list will be expanded on upon consultation with the stakeholders.

h) Technology to be used in the activity.

Although several types of drilling tools and machinery exists for prospecting, the Applicant proposes to use air drills for RAB (rotary air blast) drilling and reverse circulation drilling and diamond drill rigs will be used for core drilling. Geophysical equipment will be needed for ground electro-magnetic, magnetic and gravity surveys.

The bulk sampling trenches/pits will be dug by excavator, upon which the loosened material will be moved by FEL to the crushing/milling plant. The material will be crushed, screened, and sized to stockpiles from where it will be transported off-site by trucks.

Although sample collection will require various mechanical equipment to be on site, the process do not require highly specialised technology as secondary processing and metallurgical testing will occur off-site. Therefore no technology alternatives were deemed viable for this project.

i) Operational aspects of the activity

The operational aspects of the activity will be based on the non-invasive prospecting results. The project allows some flexibility in terms of when, where, and how the sampling and surveying is conducted. For instance, the site camp location and jeep-track routes will be determined in accordance with the landowner agreement and identified sensitive areas that must be avoided.

The project can also consider mitigating impacts such as dust generation, prospecting during agriculturally important seasons etc. The DEIAR will expand on the operational aspects of the project upon receipt of the specialist studies.

j) Option of not implementing the activity (No-go Alternative)

The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. If the no-go alternative is implemented the land in question cannot be prospected for kieselguhr, which may result in a loss of an economically viable natural resource that can be used in a variety of industries. The no-go option will further entail a loss of employment opportunities, as well as socio-economic benefits and growth development opportunities. Given the high level of unemployment and poverty in the Hay and Kuruman Magisterial Districts the loss of such opportunities is considered significant.

The positive implications of the no-go alternative are that there will be no impact on the current land use, bio- and geophysical environment of the earmarked areas.

ii) Details of the Public Participation Process Followed

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

The relevant landowners, stakeholders and I&AP's will be informed of the prospecting right application by means of an advertisement in the Noordkaap Bulletin, and on-site notices that were placed at conspicuous places. A notification letter inviting comments on the DSR over a 30-days commenting period (ending 25 March 2024) will also be send to the landowners, lawful occupier, neighbouring landowners, stakeholders, and any other I&AP that may be interested in the project. Further to this an advertisement will be placed in the Noordkaap Bulletin inviting the surrounding landowners whose contact details could thus far not be obtained to register on the project. All comments received on the DSR will be incorporated into the final Scoping Report (FSR) to be submitted to the DMRE for consideration.

The following table provides a list of the I&AP's and stakeholders that will be informed of the project:

Table 7: List of the landowners, I&AP's and stakeholders that will be informed of the project.

| LANDOWNERS | SURROUNDING LANDOWNERS |
|---|---|
| <p><u>Landowner:</u></p> <ol style="list-style-type: none"> 1. United Manganese of Kalahari (Pty) Ltd Remaining Extent of the farm Botha No 313 Portion 1 of the farm Botha No 313 2. Kudumane Manganese Resources (Pty) Ltd Remaining Extent of the farm Devon No 277 3. Kudumane Manganese Resources (Pty) Ltd / Transnet Ltd Portion 1 of the farm Devon 277 4. Mr PJ van der Byl Lambrechts Portion 4 of the farm Bermolli No 583 5. Sishen Iron Ore Company (Pty) Ltd Portion 5 of the farm Bermolli No 583 6. Me VMH Sieberhagen Remaining Extent of the farm Engelsdraai No 221 7. Van der Byl Boerdery (Pty) Ltd Portion 1 of the farm Engelsdraai No 221 8. Me EGA Maritz Remaining Extent of the farm Witdraai No 204 9. KG Mining (Pty) Ltd Portion 1 of the farm Witdraai No 204 10. Abraham Willem Adriaan van Wyk Testamentêre Trust & Me TJ van Wyk Remaining Extent of the farm Vaalwater No 84 11. Me M and Mr PJ van Biljon Portion 1 of the farm Vaalwater No 84 Portion 2 of the farm Vaalwater No 84 | <p><u>Surrounding Landowners and I&AP's:</u></p> <ul style="list-style-type: none"> ❖ J&B van Wyk Familie Trust Remaining Extent of Moodraai No 310 ❖ Amari Manganese (Pty) Ltd Portion 1 of Kongoni No 311 ❖ Assmang Ltd Remaining Extent of Telele No 312 ❖ Mr GA Coetsee Remaining Extent of Roldraai No 333 ❖ Me AS Anthonissen Remaining Extent of Perth No 276 ❖ United Manganese of Kalahari (Pty) Ltd Remaining Extent of Smartt No 314 ❖ Saltrim Ranches (Pty) Ltd Remaining Extent of Middelplaats No 332 ❖ Kudumane Manganese Resources (Pty) Ltd Portion 2 of York A No 279, Portion 11 of York A No 279, Portion 1 of Telele No 312 ❖ Mr DH Fourie Remaining Extent of Annex Langdon No 278 ❖ Mr JP Jansen Remaining Extent of York A No 279 ❖ Imperial Logistics South Africa Group (Pty) Ltd Portion 13 of York A No 279 ❖ To be confirmed Portion 12 of York A No 279 ❖ Transnet Ltd Portion 1 of Perth No 276, Portion 3 of York A No 279 ❖ Mr CH Kotze Remaining Extent of Farm No 231 ❖ Kriel Boerdery Trust |

| LANDOWNERS | SURROUNDING LANDOWNERS |
|------------|--|
| | <p>Remaining Extent of Farm No 228, Portion 1 of Farm No 228</p> <ul style="list-style-type: none"> ❖ Mr HT Snijman & Hennie Tjaart Snijman Testamentêre Trust Remaining Extent of Watervlak No 585, Portion 2 of Watervlak No 60 ❖ Floradale Boerdery CC Remaining Extent of Farm No 230 ❖ Sishen Iron Ore Company (Pty) Ltd Remaining Extent of Farm No 542, Portion 2 of Farm No 542, Portion 3 of Farm No 543 ❖ Mr TJ Snyman Remaining Extent of Gras Vlakke No 61, Remaining Extent of Farm No 223 ❖ Me VMH Sieberhagen Remaining Extent of Farm No 218 ❖ Van der Byl Boerdery (Pty) Ltd Portion 2 of Farm No 218 ❖ Pieter Bredenkamp Trust Remaining Extent of Farm No 222 ❖ Coeta-M Trust Remaining Extent of Farm No 224 ❖ QCK Lezmin 4677 (Pty) Ltd Portion 3 of Gekonsolideerde Plaas No 210 ❖ KG Mining (Pty) Ltd Portion 1 of Farm No 203 ❖ Me EGA Maritz Portion 2 of Farm No 203 ❖ Mr JH Coetzee Remaining Extent of Paauwvontein No 209, Portion 1 of Gekonsolideerde Plaas No 210 ❖ Mr MC Lambrechts Remaining Extent of Farm No 200, Portion 1 of Farm 200, Remaining Extent of Farm No 201, Portion 1 of Farm No 201, Portion 1 of Farm No 202, |

| LANDOWNERS | SURROUNDING LANDOWNERS |
|--|---|
| | <p>Remaining Extent of Farm No 203, Remaining Extent of Oudemeideskloof No 205</p> <ul style="list-style-type: none"> ❖ Mr AJC van Wyk Remaining Extent No 82 ❖ Me DGS Murray Remaining Extent of Zaai Plaats No 83 ❖ Mr PK van Zyl Remaining Extent of Kopje No 85 ❖ Mr FP van der Schyff Remaining Extent of Dell No 92, Remaining Extent of Range No 93 ❖ Abraham Willem Adriaan Van Wyk Testamentêre Trust Remaining Extent of Farm No 570 ❖ Mr JW van Niekerk Remaining Extent of Matsap No 81, Remaining Extent of Farm No 79 ❖ Oberholster Anna Gertruida B/E & Oberholster Anna Gertruida Trust Bergenaars Pad No 225, Remaining Extent of Farm No 220 ❖ Mr RJ Coetzee Paardekloof No 219 |
| STAKEHOLDERS | |
| <ul style="list-style-type: none"> ❖ Department of Agriculture, Environmental Affairs, Rural Development and Land Reform; ❖ Department of Agriculture, Land Reform and Rural Development; ❖ Department of Economic Development and Tourism; ❖ Department of Labour; ❖ Department of Roads and Public Works; ❖ Department of Water and Sanitation; ❖ Eskom; ❖ Joe Morolong Local Municipality; ❖ Joe Morolong Local Municipality (Ward 4); ❖ John Taolo Gaetsewe District Municipality; ❖ Pixley ka Seme District Municipality; ❖ Postmasburg Boerevereniging; ❖ Siyancuma Local Municipality; ❖ Siyancuma Local Municipality (Ward 1); ❖ Siyancuma Local Municipality (Ward 7); ❖ South African Heritage Resources Agency; | |

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| LANDOWNERS | SURROUNDING LANDOWNERS |
|---|-------------------------------|
| <ul style="list-style-type: none">❖ Tsantsabane Local Municipality;❖ Tsantsabane Local Municipality (Ward 7);❖ ZF Mgcawu District Municipality. | |

Upon approval of the Final Scoping Report the Draft Environmental Impact Assessment Report will be compiled and circulated for public comment for a 30-day commenting period. The comments received on the draft EIA & EMPR will be incorporated into the final EIA & EMPR to be submitted for decision making to the DMRE.

iii) Summary of issues raised by I&Aps

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

Table 8: Summary of issues raised by I&AP's and stakeholders.

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's response to issues raised by the Applicant |
|---|----------|--|--|---|
| List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted | | | | |
| AFFECTED PARTIES | | - | - | - |
| Landowner/s | X | - | - | - |
| United Manganese of Kalahari (Pty) Ltd (UMK) ❖ Remaining Extent of Botha No 313 | X | 15/02/2024 & 19/02/2024 | Mr Phayane registered as the representative of UMK, following which Mr Mudau requested to be registered as an I&AP on behalf of UMK on 19 February 2024. | Greenmined acknowledged both registrations and supplied Mr Mudau with a copy of the Regulation 2.2 Project Map. Both parties will be invited to comment on the DSR in due course and any comments will be added to the FSR. |
| United Manganese of Kalahari (Pty) Ltd ❖ Portion 1 of Botha No 313 | X | | | |
| Kudumane Manganese Resources (Pty) Ltd (KMR) ❖ Remaining Extent of Devon No 277 | X | 13/02/2024 | KMR registered on 13 February 2024 on the project and noted that as surface right holder, they appeal the application. | Greenmined acknowledged the registration and appeal of KMR. KMR will be invited to comment on the DSR in due course and any additional comments will be added to the FSR. |
| Kudumane Manganese Resources (Pty) Ltd / Transnet Ltd ❖ Portion 1 of Devon 277 | X | | | |
| Mr PJ van der Byl Lambrechts ❖ Portion 4 of Bermolli No 583 | X | The Applicant is in consultation with the landowners of the PR application and any comments received on the DSR will be incorporated into the FSR. | | |
| Sishen Iron Ore Company (Pty) Ltd ❖ Portion 5 of Bermolli No 583 | X | | | |
| Me VMH Sieberhagen ❖ Remaining Extent of Engelsdraai No 221 | X | | | |
| Van der Byl Boerdery (Pty) Ltd | X | | | |

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| Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted | Date Comments Received | Issues raised | EAP's response to issues raised by the Applicant |
|---|-------------------------------|--|---|
| ❖ Portion 1 of the farm Engelsdraai No 221 | | | |
| Me EGA Maritz ❖ Remaining Extent of the farm Witdraai No 204 | X | The Applicant is in consultation with the landowners of the PR application and any comments received on the DSR will be incorporated into the FSR. | |
| KG Mining (Pty) Ltd ❖ Portion 1 of the farm Witdraai No 204 | X | | |
| Abraham Willem Adriaan van Wyk Testamentêre Trust & Me TJ van Wyk ❖ Remaining Extent of the farm Vaalwater No 84 | X | | |
| Me M and Mr PJ van Biljon ❖ Portion 1 of the farm Vaalwater No 84 ❖ Portion 2 of the farm Vaalwater No 84 | X | | |
| Lawful occupier/s of the land | X | | - |
| No lawful occupiers were identified to date. | - | - | |
| Landowners or lawful on adjacent properties | X | - | - |
| J&B van Wyk Familie Trust ❖ Remaining Extent of Mooidraai No 310 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |

| Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted | Date Comments Received | Issues raised | EAP's response to issues raised by the Applicant |
|--|------------------------------|---------------|---|
| Amari Manganese (Pty) Ltd care of ERG Management (South Africa) (Pty) Ltd ❖ Portion 1 of Kongoni No 311 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |
| Assmang Ltd ❖ Remaining Extent of Telele No 312 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |
| Mr GA Coetsee ❖ Remaining Extent of Roldraai No 333 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |
| Me AS Anthonissen ❖ Remaining Extent of Perth No 276 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |
| United Manganese of Kalahari (Pty) Ltd ❖ Remaining Extent of Smartt No 314 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |
| Saltrim Ranches (Pty) Ltd ❖ Remaining Extent of Middelplaats No 332 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |
| Kudumane Manganese Resources (Pty) Ltd ❖ Portion 2 of York A No 279, ❖ Portion 11 of York A No 279, ❖ Portion 1 of Telele No 312 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |
| Mr DH Fourie ❖ Remaining Extent of Annex Langdon No 278 | X | | Any comments received on the draft scoping report will be incorporated into the final scoping report. |

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| <p>Interested and Affected Parties</p> <p>List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted</p> | <p>Date Comments Received</p> | <p>Issues raised</p> | <p>EAP's response to issues raised by the Applicant</p> |
|---|--------------------------------------|--|--|
| <p>Mr JP Jansen ❖ Remaining Extent of York A No 279</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Imperial Logistics South Africa Group (Pty) Ltd ❖ Portion 13 of York A No 279</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>To be confirmed ❖ Portion 12 of York A No 279</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Transnet Ltd ❖ Portion 1 of Perth No 276, ❖ Portion 3 of York A No 279</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Mr CH Kotze ❖ Remaining Extent of Farm No 231</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Kriel Boerdery Trust ❖ Remaining Extent of Farm No 228, ❖ Portion 1 of Farm No 228</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Mr HT Snijman & Hennie Tjaart Snijman Testamentêre Trust ❖ Remaining Extent of Watervlak No 585, ❖ Portion 2 of Watervlak No 60</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Floradale Boerdery CC ❖ Remaining Extent of Farm No 230</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |

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| Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted | Date Comments Received | Issues raised | EAP's response to issues raised by the Applicant |
|--|------------------------|---|--|
| Sishen Iron Ore Company (Pty) Ltd ❖ Remaining Extent of Farm No 542, ❖ Portion 2 of Farm No 542, ❖ Portion 3 of Farm No 543 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Mr TJ Snyman ❖ Remaining Extent of Gras Vlakte No 61, ❖ Remaining Extent of Farm No 223 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Me VMH Sieberhagen ❖ Remaining Extent of Farm No 218 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Van der Byl Boerdery (Pty) Ltd ❖ Portion 2 of Farm No 218 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Pieter Bredenkamp Trust ❖ Remaining Extent of Farm No 222 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Coeta-M Trust ❖ Remaining Extent of Farm No 224 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| QCK Lezmin 4677 (Pty) Ltd ❖ Portion 3 of Gekonsolideerde Plaas No 210 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| KG Mining (Pty) Ltd ❖ Portion 1 of Farm No 203 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |

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| <p>Interested and Affected Parties</p> <p>List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted</p> | <p>Date Comments Received</p> | <p>Issues raised</p> | <p>EAP's response to issues raised by the Applicant</p> |
|--|--------------------------------------|--|--|
| <p>Me EGA Maritz ❖ Portion 2 of Farm No 203</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Mr JH Coetzee ❖ Remaining Extent of Paauwvontein No 209, ❖ Portion 1 of Gekonsolideerde Plaas No 210</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Mr MC Lambrechts ❖ Remaining Extent of Farm No 200, ❖ Portion 1 of Farm 200, ❖ Remaining Extent of Farm No 201, ❖ Portion 1 of Farm No 201, ❖ Portion 1 of Farm No 202, ❖ Remaining Extent of Farm No 203, ❖ Remaining Extent of Oudemeideskloof No 205</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Mr AJC van Wyk ❖ Remaining Extent No 82</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Me DGS Murray ❖ Remaining Extent of Zaai Plaats No 83</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |
| <p>Mr PK van Zyl ❖ Remaining Extent of Kopje No 85</p> | <p>X</p> | <p>Any comments received on the draft scoping report will be incorporated into the final scoping report.</p> | |

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| Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted | Date Comments Received | Issues raised | EAP's response to issues raised by the Applicant |
|--|------------------------|---|--|
| Mr FP van der Schyff ❖ Remaining Extent of Dell No 92, ❖ Remaining Extent of Range No 93 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Abraham Willem Adriaan Van Wyk Testamentêre Trust ❖ Remaining Extent of Farm No 570 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Mr JW van Niekerk ❖ Remaining Extent of Matsap No 81, ❖ Remaining Extent of Farm No 79 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Oberholster Anna Gertruida B/E & Oberholster Anna Gertruida Trust ❖ Bergenaars Pad No 225 ❖ Farm No 220 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Mr RJ Coetzee ❖ Paardekloof No 219 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Municipal councillor | X | - | |
| Joe Morolong Local Municipality Ward 4 | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | |
| Tsantsabane Local Municipality Ward 7 | X | | |
| Siyancuma Local Municipality Ward 1 | X | | |
| Siyancuma Local Municipality Ward 7 | X | | |

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| Interested and Affected Parties | | Date | Issues raised | EAP's response to issues raised by the Applicant |
|---|---|---|---|--|
| List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted | | Comments Received | | |
| Municipality | X | | - | |
| Joe Morolong Local Municipality (JMLM) | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Tsantsabane Local Municipality (TLM) | X | | | |
| Siyancuma Local Municipality (SLM) | X | | | |
| Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA etc) | X | - | - | - |
| Department of Roads and Public Works | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Department of Water and Sanitation | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Eskom | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Communities | | No communities border the prospecting area or were identified within 100 m from the site. | | |
| - | - | - | - | - |
| - | - | - | - | - |
| - | - | - | - | - |
| Dept. Land Affairs | - | 15/01/2024 | The Commission on Restitution of Land Rights confirmed on 15 January 2024 that no land claims appears on their database in respect of the properties this application extends across. | - |
| - | - | - | - | - |
| Traditional Leaders | | No tribal land borders the prospecting area or were identified within 100 m from the site. | | |

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| Interested and Affected Parties | | Date | Issues raised | EAP's response to issues raised by the Applicant |
|---|---|---|---------------|--|
| List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted | | Comments Received | | |
| - | - | - | - | - |
| Dept. Environmental Affairs | X | | | |
| Department of Agriculture, Environmental Affairs, Rural Development and Land Reform | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Other Competent Authorities affected | | - | - | - |
| Department of Agriculture, Land Reform and Rural Development | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Department of Labour | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Department of Economic Development and Tourism | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| John Taolo Gaetsewe District Municipality (JTGDM) | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| ZF Mgcau District Municipality (ZFMDM) | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| Pixley ka Seme District Municipality (PSDM) | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| South African Heritage Resources Agency (SAHRA) | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |
| OTHER AFFECTED PARTIES | | - | - | - |
| - | | - | - | - |
| INTERESTED PARTIES | | - | - | - |
| Postmasburg Boerevereniging | X | Any comments received on the draft scoping report will be incorporated into the final scoping report. | | |

iv) The Environmental attributes associated with the sites.

(1) Baseline Environment

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

(its current geographical, physical, biological, socio-economic, and cultural character)

This section describes the general biophysical, cultural, and socio-economic environment as well as baseline conditions that may be affected by the proposed project. The information provided here was obtained from desktop studies and an initial site inspection and must be treated as preliminary. More detailed information based on specialist findings, obtained from focussed investigations will be collected during the EIA process and elaborated on in the DEIAR. The information presented below was divided into the Hay-, and Kuruman Administrative Districts respectively.

PHYSICAL ENVIRONMENT

CLIMATE

Kuruman Administrative District – Hotazel

The long-term average annual rainfall of Hotazel is 336.4 mm of which the bulk is received from October – March. Temperatures vary from an average monthly maximum and minimum of 36.7 °C and 11°C in January to 23.2°C and -2.9°C in July respectively. The highest temperature that has been recorded is 41.6°C and the lowest -7.5°C.

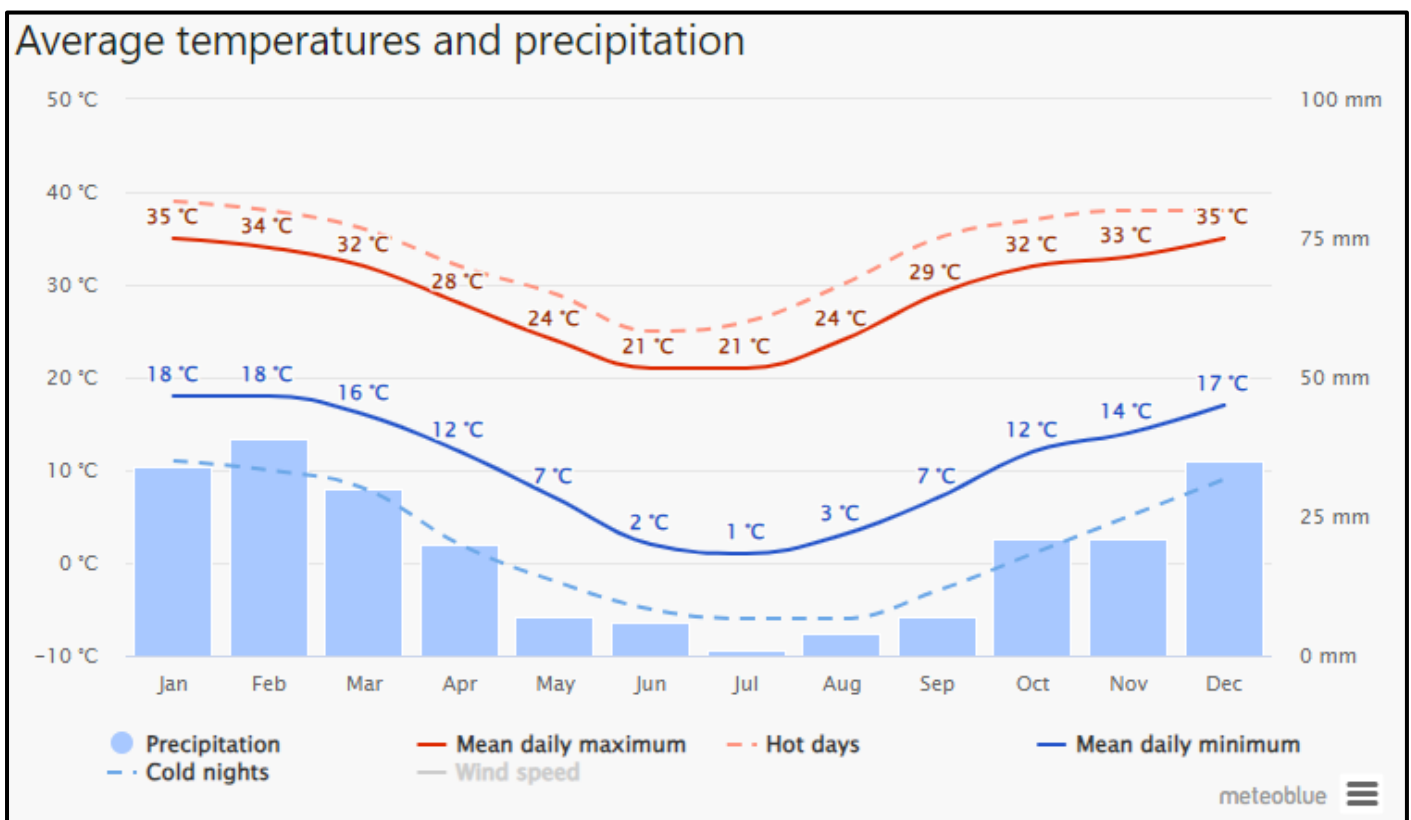


Figure 6: Average temperatures and precipitation for Hotazel (image obtained from https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/hotazel_south-africa_995397).

According to the Windfinder website the nearest station to record wind data of the area is the Kathu/Sishen weather station. According to this station the prevailing wind direction of the area is in a north/north-western direction with an average wind speed of 13 km/h. The following figure shows the monthly wind distribution of the Kathu/Sishen area within proximity to the application area.

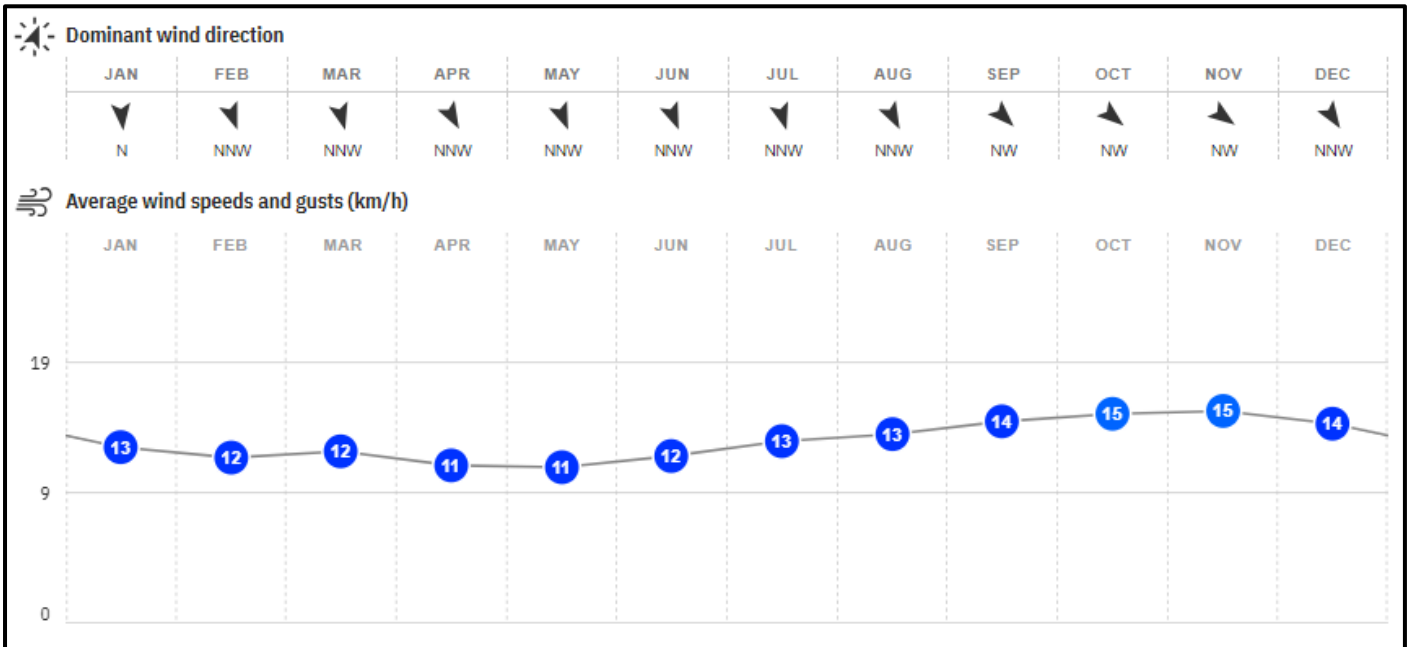


Figure 7: Monthly wind speed statistics and directions for Kathu/Sishen (image obtained from www.windfinder.com/windstatistics/kathu_sishen).

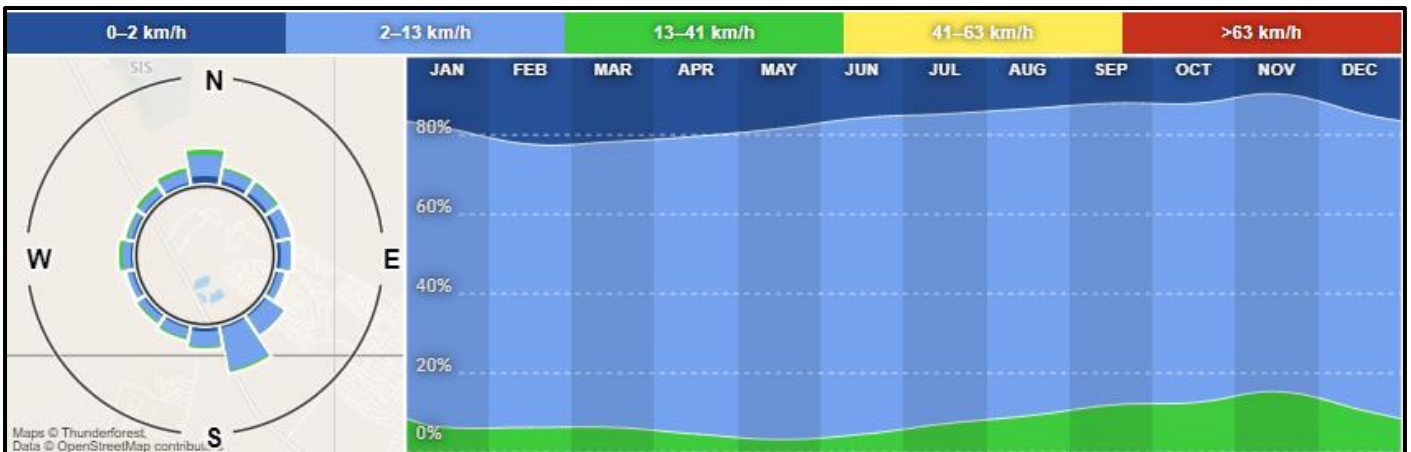


Figure 8: Monthly wind direction and strength distribution for Kathu/Sishen (image obtained from www.windfinder.com/windstatistics/kathu_sishen).

Hay Administrative District - Postmasburg

According to the saexplorer website, Postmasburg normally receives ±241 mm of rain per year, with most rainfall occurring mainly during summer. The chart below (lower left) shows the average rainfall values for Postmasburg per month. It receives the lowest rainfall (0 mm) in July and the highest (57 mm) in March. The monthly distribution of

average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Postmasburg range from 17°C in June to 32°C in January. The region is the coldest during July when the mercury drops to 0°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.

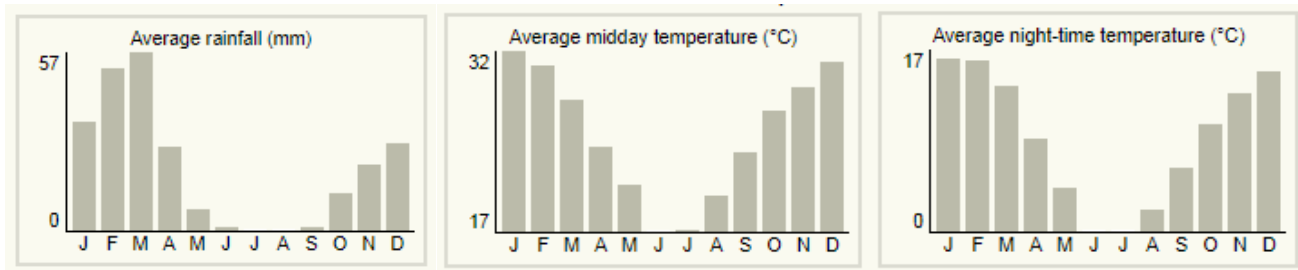


Figure 9: Charts showing the climatic averages of the Postmasburg region (information obtained from SAExplorer).

The dominant wind direction of Postmasburg is fairly constant ranging from north to west-northwest, with the average wind speed being ±6 knots (11.11 km/h) as shown in the following figure.

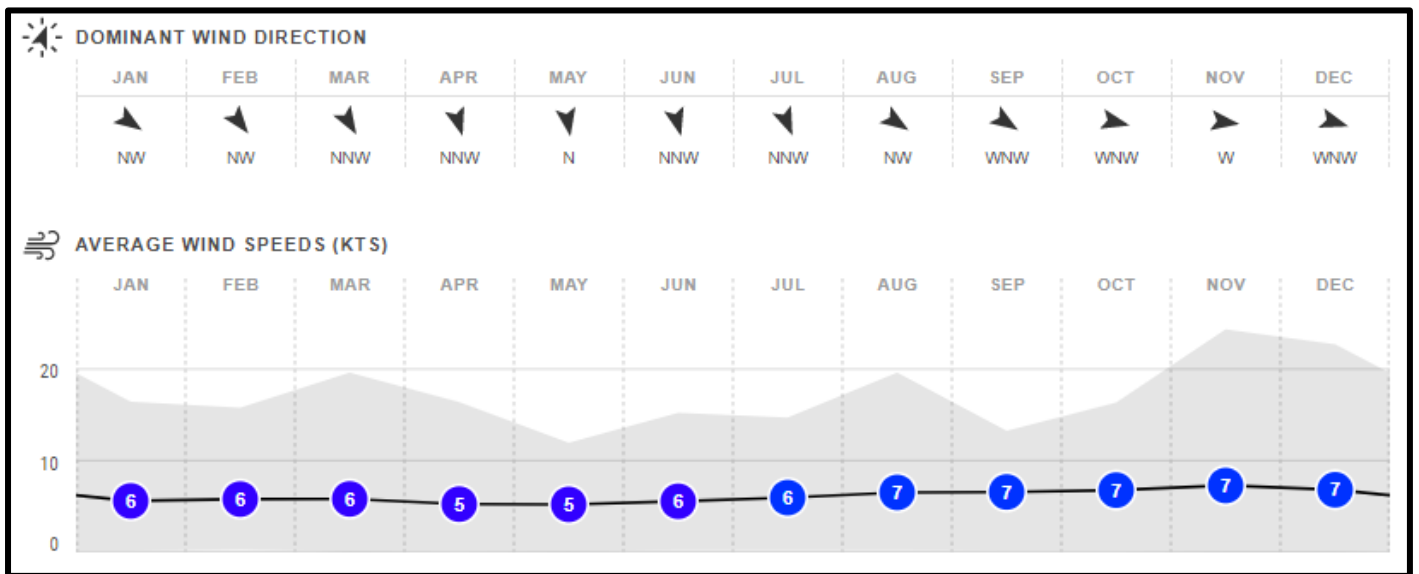


Figure 10: Image showing the dominant wind direction and average wind speed over a 12 month period for the Postmasburg area. (Image obtained from www.windfinder.com/windstatistics/postmasburg)

TOPOGRAPHY

Kuruman Administrative District – Hotazel

The topography of the greater study area that includes the farms Botha No 313 and Devon No 277 is shown in the following figure. The area forms part of the inland plateau of South Africa with elevations generally at ±1 060 amsl. The landscape of the district is predominantly flat, with a ridge system bisecting the greater municipality along a north-

south axis. This feature, the Kuruman hills, creates the only significant variation in the otherwise flat landscape of the municipality (van Weele, 2011 and AGIS, 2015). The study area is situated in typical Kalahari surroundings. The topography alternates between elevated areas with poor developed soils to very deep developed soil type with poor differentiation between the different soil horizons in the plains. The Kuruman hills also determine the drainage pattern of the Kuruman river system with the alignment of the ridge forcing the draining of water in the area northwards before turning sharply west. The Kuruman River is a tributary of the Molopo River which eventually converges with the Orange River (van Weele, 2011 and AGIS, 2015).

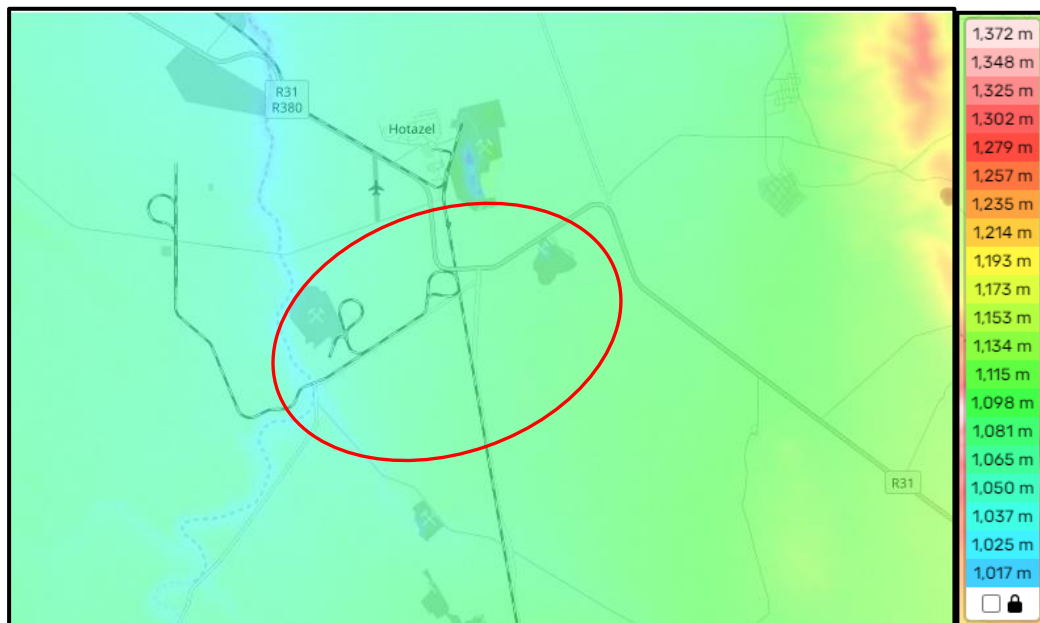


Figure 11: Map showing the topography of the greater Hotazel area (image obtained from <https://en-za.topographic-map.com/map-6m7zs/South-Africa/?center=-27.31565%2C22.96555&zoom=10>).

Hay Magisterial District – Postmasburg

The topography of the greater study area that includes the farms Bermolli No 583, Engelsdraai No 221, Vaalwater No 84, and Witdraai No 204 is shown in the following figure. The area forms part of the inland plateau of South Africa with elevations generally at $\pm 1\ 100$ amsl. The general topography of the application area varies from flat to gently undulating plains with the Langberge flanking Bermolli no 583, Engelsdraai No 221, and Witdraai No 204 to the west. The topography of Vaalwater No 84 is flat with singular hills/koppies on specifically the Remainder of Vaalwater No 84. This farm also has various depressions or pans that hold water during the rainy season.

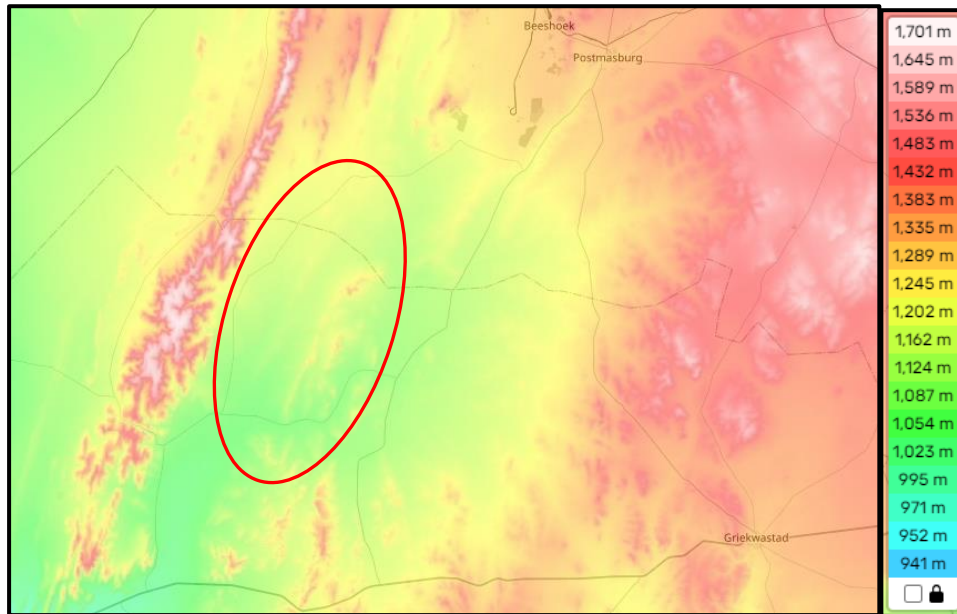


Figure 12: Map showing the topography of the greater Postmasburg area (image obtained from <https://en-za.topographic-map.com/map-6m7zs/South-Africa/?center=-27.31565%2C22.96555&zoom=10>).

VISUAL CHARACTERISTICS

The visual character of the greater study areas (Hay & Kuruman Districts) mainly comprise of an agricultural setting intersected by mining, road-, railway- and electricity infrastructure. Through the years the Postmasburg (Hay) area has become known for its manganese and iron ore potential and mines such as Kumba Iron Ore, Beeshoek-, Heuningkranz-, and Kolomela Mine were established. The towns of Hotazel, Kuruman and Postmasburg have a low aesthetic value.

The immediate surrounding land uses, adjacent of the earmarked farms, mainly include agricultural activities (grazing) and/or mining. The aesthetic ambiance of the region is high and represents that of a rural area with natural landscapes altered, in some areas, by mining.

GEOLOGY AND SOILS

1. REGIONAL GEOLOGY

The regional geology of the study area forms part of the Transvaal Super Group. The Transvaal Super Group was deposited in two structurally controlled basins i.e. Transvaal and Griqualand West.

DIATOMITE / KIESELGUHR / DIATOMACEOUS EARTH PROSPECTING RIGHT
DRAFT SCOPING REPORT

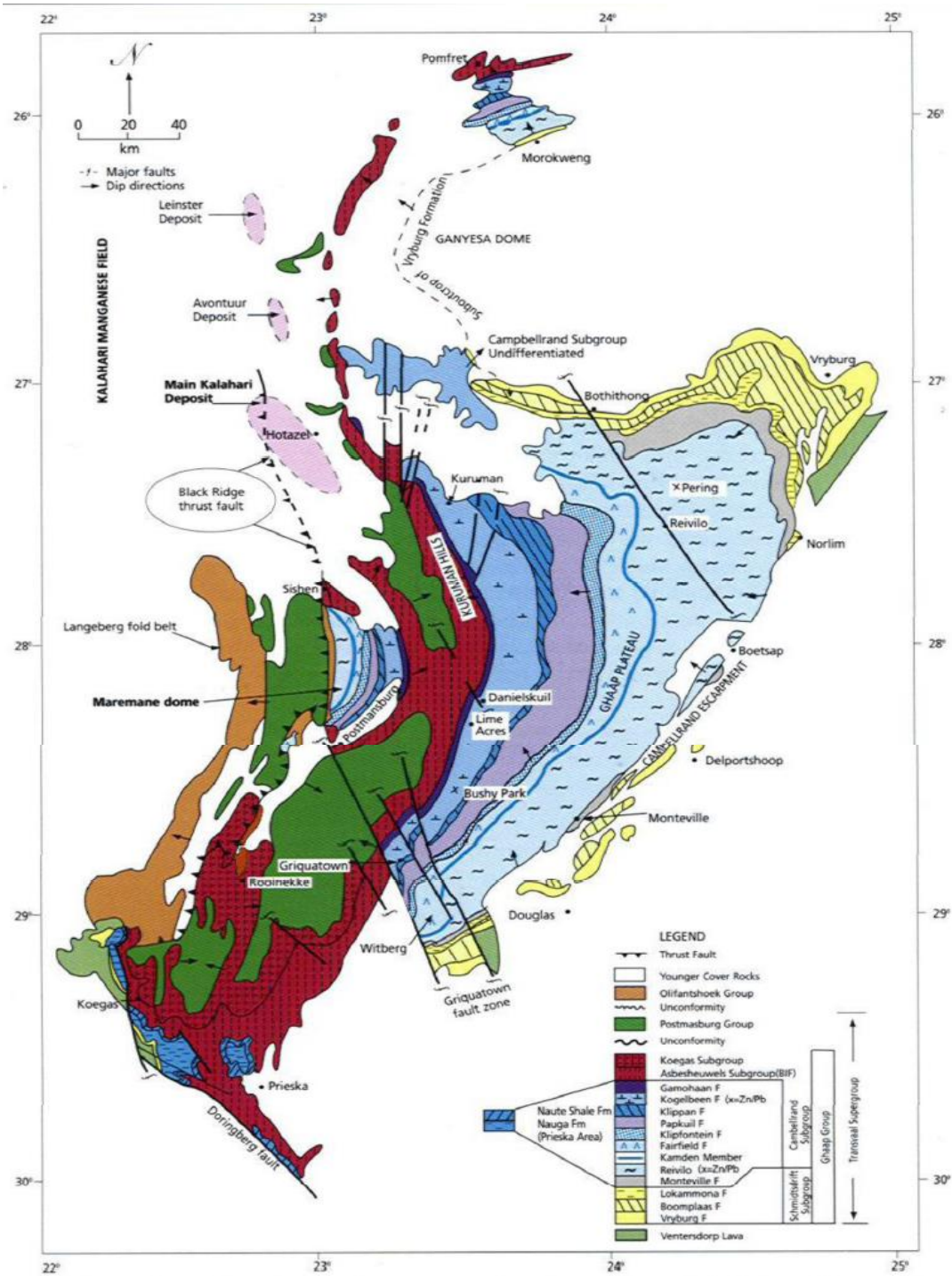


Figure 13: Geological map of Griqualand West (modified from Beukes 1986) (image obtained from Gamagara Resources (Pty) Ltd 2019).

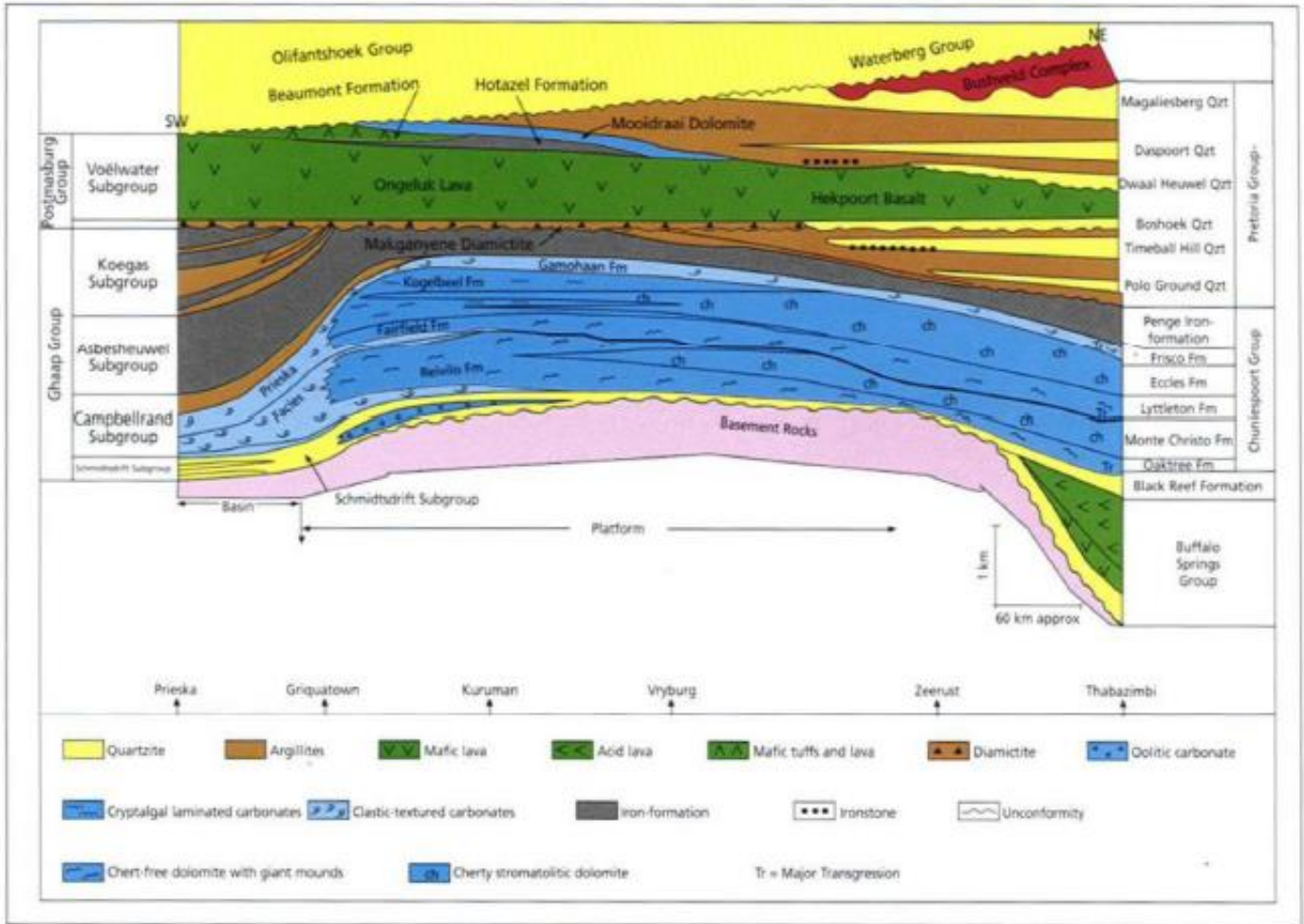


Figure 14: A southwest-northeast 600 km cross-section showing the simplified geology of the Transvaal Supergroup and the distribution of other important geological features (modified from Beukes 1983) (image obtained from Gamagara Resources (Pty) Ltd 2019).

The rock stratigraphy within the Griqualand West depository, forms part of the early Proterozoic-Transvaal Supergroup sequence. The Postmasburg Manganese Field is located along the western margin of the Kaapvaal Craton and on the eastern limb of the Maremane Dome.

In Griqualand West the succession can be broadly subdivided into a basal, chemical sedimentary unit, referred to as the Ghaap Group, which is overlain by a mixed volcanic-clastic-chemical sequence, known as the Postmasburg Group. The Ghaap and Postmasburg Groups represent two separate, major unconformity-bounded sequences (Cheney and Winter, 1995).

2. GHAAP GROUP

The Ghaap Group is subdivided, from the base upward, into the Schmidtsdrif Subgroup (interbedded siliclastics and carbonates), the Campbellrand Subgroup (carbonates),

the Asbesheuwel Subgroup (iron formation) and the Koegas Subgroup (interbedded siliclastics and iron formations).

2.1 Schmidtsdrif Subgroup

The basal Schmidtsdrif Subgroup comprises fluviially deposited feldspatic quartz arenites, shallow marine, and intertidal quartz arenites as well as a platformal carbonate sequence (Beukes, 1979).

2.2 Campbellrand Subgroup

The Campbellrand Subgroup consists of stromatolitic dolomite and limestone platform facies, which interfingers down slope with carbonate turbidites. The turbidites have been ankerized and silicified to form banded ferruginous chert. Toward the south the turbidites interfinger with carbonaceous shale (Prieska facies), which, according to Beukes, relates to deposition within a euxinic basin, in front of the carbonate platform.

2.3 Asbesheuwel Subgroup

Shallow water carbonate deposition was terminated during a major transgression, which drowned the shelf, resulting in a fairly sudden transition from carbonates through cherts and into the banded iron formation of the Asbesheuwel Subgroup. Beukes, 1978 subdivided the Asbesheuwel Subgroup into the Kuruman Iron Formation at the base followed by the Griquatown Iron Formation at the top. According to Beukes the Kuruman Iron Formation was deposited within a deep shelf setting over the entire Kaapvaal Craton. It comprises an upward-shallowing sequence consisting of carbonaceous shale deposited in an euxinic basin, ankerite-banded chert, representing distal carbonate turbidites which was deposited in a transition zone, between the euxinic basin and the open shelf. Magnetite-hematite-chert micro banded rhythmite macrocycles containing interbedded stilpnomelane band- lutes, were deposited on the deep open shelf, while greenalite-siderite rhythmites mark the toe-of-slope and slope areas of a shallow water platform. The Ouplaas Member, which marks the top of the Kuruman Iron Formation, represents a clastic-textured shallow-water platform deposit.

The Griquatown Iron Formation overlies the Kuruman Iron Formation and consists of upward coarsening megacycles, deposited in environments that vary from low energy, subtidal to high energy, intertidal and lagoonal settings.

2.4 Koegas Subgroup

The Koegas Subgroup was only deposited down slope and within the deeper part of the basin toward the south (Prieska area) and is absent toward the north (Sishen). The Koegas Subgroup was deposited during a transgressional phase and comprises a quartz-chlorite-mudstone unit at the base followed upward by iron formations with interbedded quartz-wackes, with more iron formations, containing interbedded carbonates toward the top. The Koegas Subgroup was subdivided by Beukes; (1978), from the base upward into the following formations:

- ❖ Pannetjie Formation: Quartz-chloritic mudstone.
- ❖ Dorasdale Formation: Iron-lutites.
- ❖ Kwakwas Formation: Greenalite-lutites and interbedded quartzwackes.
- ❖ Naragas Formation: Mudstones and carbonates.
- ❖ Rooinekke Formation: Iron band-lutites
- ❖ Nelani Formation: Mudstones with interbedded limestone, chert, and grit beds

3. POSTMASBURG GROUP

Uplift and erosion of the platform strata took place prior to the deposition of the Makganyene Diamictite Formation at the base of the Postmasburg Group (Beukes, 1983, 1984). Visser (1971) and de Villiers and Visser (1977) considered the diamictite to be of glacial origin. The Postmasburg Group has been subdivided, from the base upward, into the following formations:

- ❖ Makganyene Formation (glacial diamictites).
- ❖ Ongeluk Formation (basaltic lavas).
- ❖ Hotazel Iron Formation (Banded iron stones, host to manganese deposits within the Kalahari Manganese Basin).
- ❖ Moidraai Formation (dolomites).

The different formations within the Postmasburg Group, conformably follows on top of one another. During post Postmasburg times, the Postmasburg Group was exposed to intense weathering. The erosional unconformity progressively cuts down the Stratigraphy, moving from the north (Hotazel area) toward the south (Postmasburg area), truncating gradually the Moidraai, the Hotazel, Ongeluk, Makganyene and Asbesheuwel Formations to finally rest on dolomites of the Campbellrand Subgroup on the Maremane Dome near Postmasburg.

4. OLIFANTSHOEK GROUP

The unconformity is overlain by the Olifantshoek Group, which comprises shales at the base (Mapedi Formation) followed by quartzites of the Lucknow Formation. In the Sishen-Postmasburg area the Olifantshoek Group, is referred to as the Gamagara Formation. The unconformity is marked by a hematitepebble conglomerate and shale unit. The Olifantshoek unconformity is of utmost economic importance within the area. Where it rests on the Asbesheuwel Subgroup, hematite iron ore was formed (Iskor and Beeshoek), where it truncates the Campbellrand dolomites, manganese mineralization is developed (Postmasburg Manganese Field).

5. DIATOMITE (KIESELGUHR)

Kieselguhr, diatomaceous earth and diatomite are the names commonly used for remarkably light, dull white or pale-coloured, massive to finely laminated chalky-looking, highly porous sediment composed mainly of the minute hollow opaline protective shells of unicellular aquatic plants known as diatoms.

Within the Griqualand West area, the diatoms appear to overlay either lava of the Ongeluk Sub-Group, or Dwyka shale (Base Kalahari Formation) along ancient water courses and paleo-marshes.



Figure 15: Example of kieselguhr (Van der Merwe)

HYDROLOGY

(Information extracted from the Lower Vaal Water Management Area: Internal Strategic Perspective, October 2004 & Development of ISPs for Central Region: Lower Orange WMA, July 2004. DWAF)

The farms Botha No 313, Devon No 277, and Bermolli No 583 are within the Molopo Sub-Water Management Area (SWMA) which is managed as part of the Lower Vaal Water Management Area (WMA ID 20). Although the Molopo SWMA forms part of the Lower Vaal WMA, it does not form part of the model for the Vaal River System as drainage of surface water from the Molopo SWMA occurs in the direction of the Orange River and not the Vaal River. The Molopo SWMA is considered an endoeric area as flows from the Molopo River have not reached the Orange River in recorded history. The bulk of the water used in this sub-catchment is from groundwater. The groundwater quality from most of the boreholes in the study area is fit for human and domestic animal use. Borehole yields in the calcrete aquifer generally vary from 0.2 to ± 2 l/s.

The Ga-Mogara Stream borders the farm Botha No 313 to the west/north-western. At the junction of the farms Devon No 277 and Botha No 313 the Witleegte Stream joins the Ga-Mogara Stream. According to the SANBI BGIS data an unnamed ephemeral drainage line is shown to cross through the eastern part of the farm Bermolli No 583. This line is shown to feed into a pan classified as an Upper Nama Karoo Depression on the SANBI BGIS Mapviewer as shown below. However, the presence of the drainage line and pan will need to be confirmed during the EIA phase.



Figure 16: Figure indicating the position of the Upper Nama Karoo Depression (blue polygon with yellow outline) on the farm Bermolli No 583 as indicated on the BGIS Map Viewer – National Wetlands and NFEPA.

According to the National Freshwater Ecosystem Priority Areas (NFEPA) map as presented by SANBI, neither the farms Botha No 313 nor Devon No 277 are within a NFEPA of conservation importance as shown in the following figure.

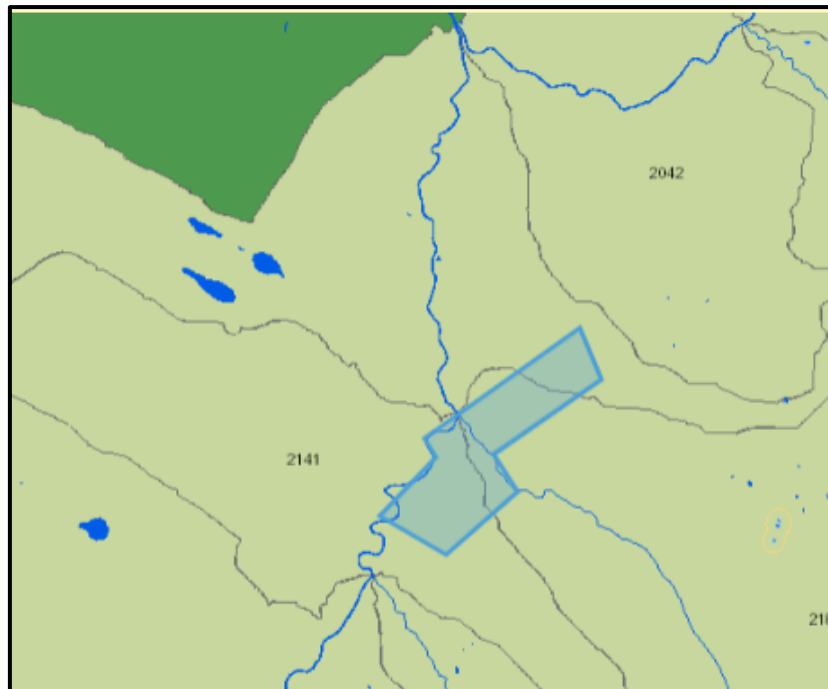


Figure 17: Map showing the position of the nearest NFEPA (dark green polygon) north-west of the study area (blue polygon). The Ga-Mogara Stream runs along the western boundary of the study area while the Witleegte Stream cuts between the two properties. (Image obtained from the BGIS Map Viewer – National Wetlands and NFEPA)

The farms Engelsdraai No 221, Vaalwater No 84, and Witdraai No 204 are within the Orange SWMA that is managed as part of the Lower Orange Water Management Area. The Lower Orange WMA is the lowest WMA in the Orange/Vaal River Basin. The Vaal River is the main tributary to the Orange River, other tributaries are the Ongers and Hartebeest Rivers from the south, and the Molopo River and Fish River (Namibia) from the north. The Orange SWMA includes the Orange River over the whole of its length through the WMA together with minor tributary streams. Groundwater utilisation is of major importance across wide areas in the Lower Orange WMA and often constitutes the only source of water.

At least one ephemeral drainage line was identified that runs through the farm Engelsdraai No 221. The Soutloop Stream dissects the farm Witdraai No 204 into northern and southern sections. Various pans also classified as Upper Nama Karoo Depressions are present on the farm Vaalwater No 84. A large pan system lays directly north of the farm with smaller pans within the farm boundaries that are fed by runoff from the higher laying areas/koppies.

The following figure shows both Bermolli No 583 and Engelsdraai No 221 within a FEPA area of conservation importance, while the more southern farms Vaalwater No 84 and Witdraai No 204 fall outside the FEPA's.

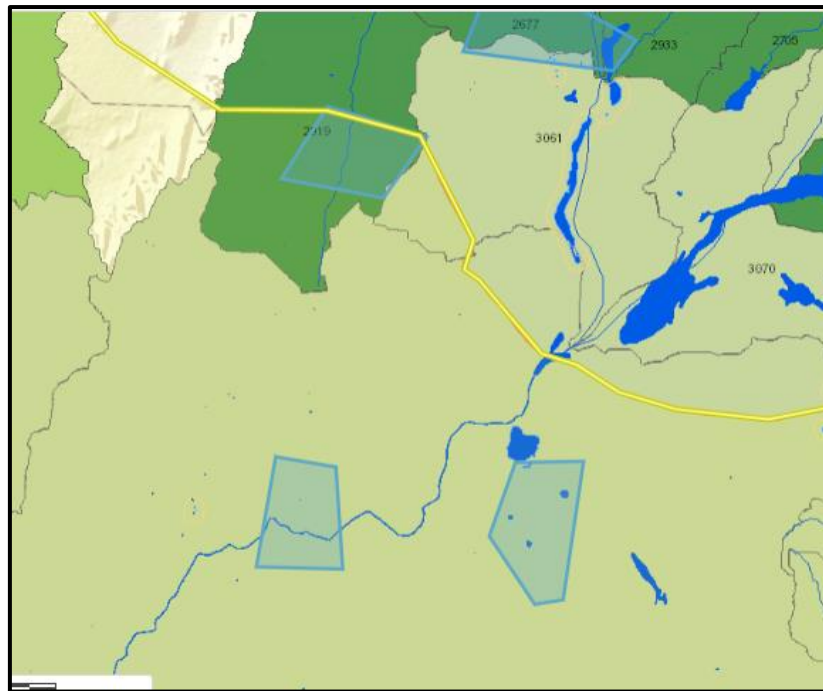


Figure 18: Map showing Bermolli No 583 (upper most farm) and Engelsdraai No 221 (second upper most polygon) within the NFEPA (dark green polygon), while the two lower farms Witdraai No 204 (west) and Vaalwater No 84 (east) are outside a FEPA. Note the Soutloop Stream crossing through Witdraai No 204 as well as the pan system north of Vaalwater No 48. (Image obtained from the BGIS Map Viewer – National Wetlands and NFEPA)

Also refer to Scoping Report (2)(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Hydrology.*

AIR QUALITY AND NOISE AMBIANCE

Due to the low rainfall, the air quality of the study area is characterised as being dry, arid, and dusty. Dust is the most important pollutant given the area's rural character predominantly affected by agriculture and/or mining. The noise ambiance of the study area is classified as ambient rural or pastoral with noise levels mainly affected by traffic along the R31, R380, R309, R383, railway traffic, farming equipment and mining related operations.

Also refer to Part 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Air Quality and Noise Ambiance.*

BIOLOGICAL ENVIRONMENT

BIODIVERSITY CONSERVATION AREAS

According to the DFFE Screening Report (see following image) an Ecological Support Area (ESA) is present along the south-western boundary of the farm Devon No 277. The Lexicon of Biodiversity Planning in South Africa provides the following definition for an ESA area:

- ❖ Ecological Support Area (ESA): *“An area that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a CBA or protected area, or to generate or deliver ecosystem services, or to meet remaining biodiversity targets for ecosystem types or species when it is not possible or not necessary to meet them in natural or near-natural areas.”*

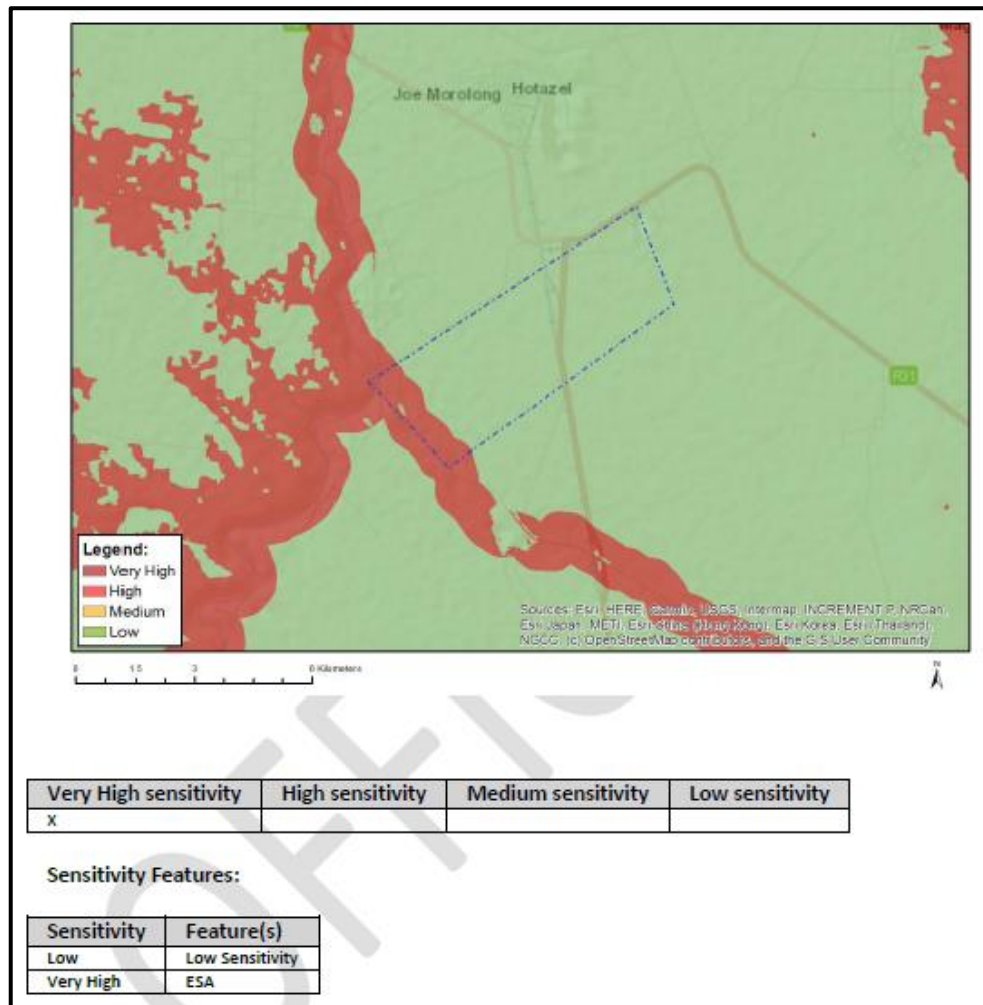


Figure 19: Terrestrial Biodiversity theme sensitivity of Devon No 277 according to the DFFE screening report.

The same ESA (that borders the farm Devon No 277) borders the farm Botha No 313 along the north-western and north-eastern boundaries as shown below.

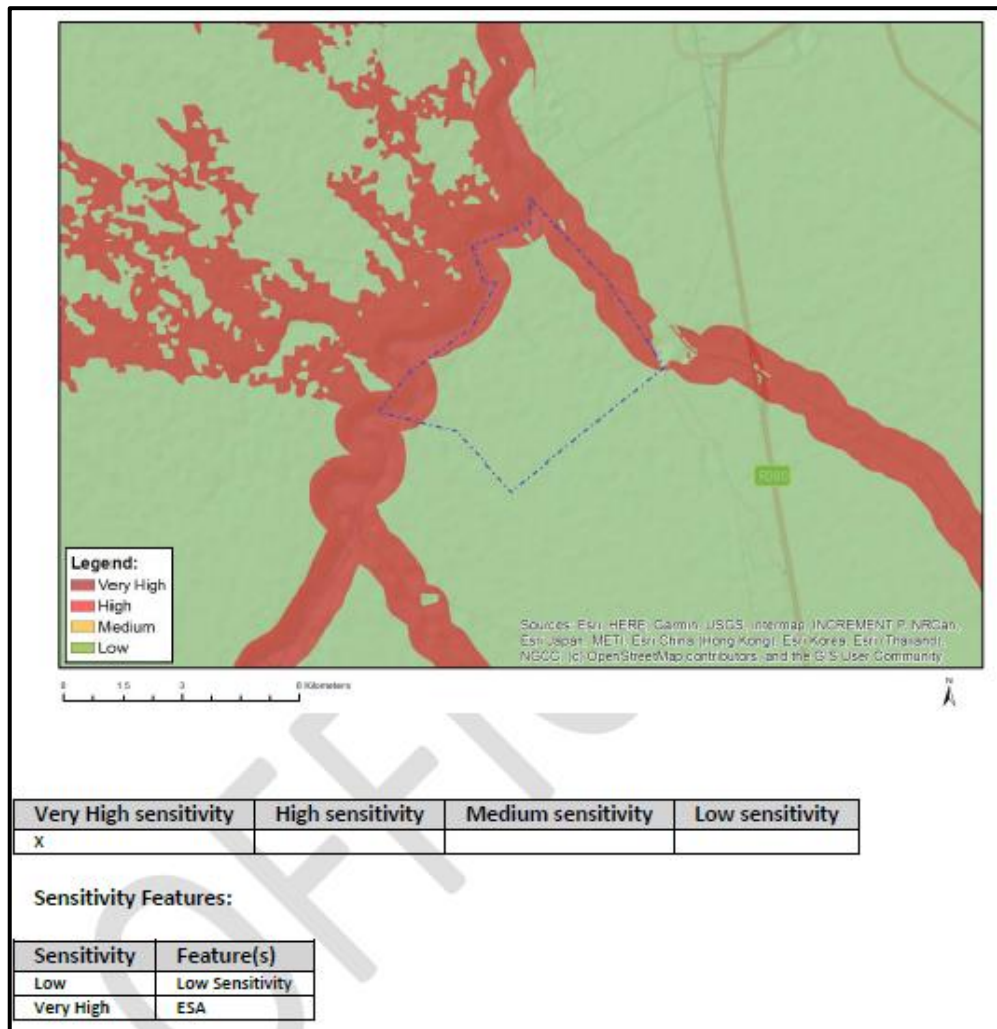


Figure 20: Terrestrial Biodiversity theme sensitivity of Botha No 313 according to the DFFE screening report.

The farm Bermolli No 583 is mostly within a Critical Biodiversity Area (CBA). The Lexicon of Biodiversity Planning in South Africa provides the following definition for an CBA:

- ❖ Critical Biodiversity Area (CBA): *“An area that must be maintained in a good ecological condition in order to meet biodiversity targets. CBA’s collectively meet biodiversity targets for all ecosystem types as well as for species and ecological processes that depend on natural or near-natural habitat, that have not already been met in the protected area network.”*

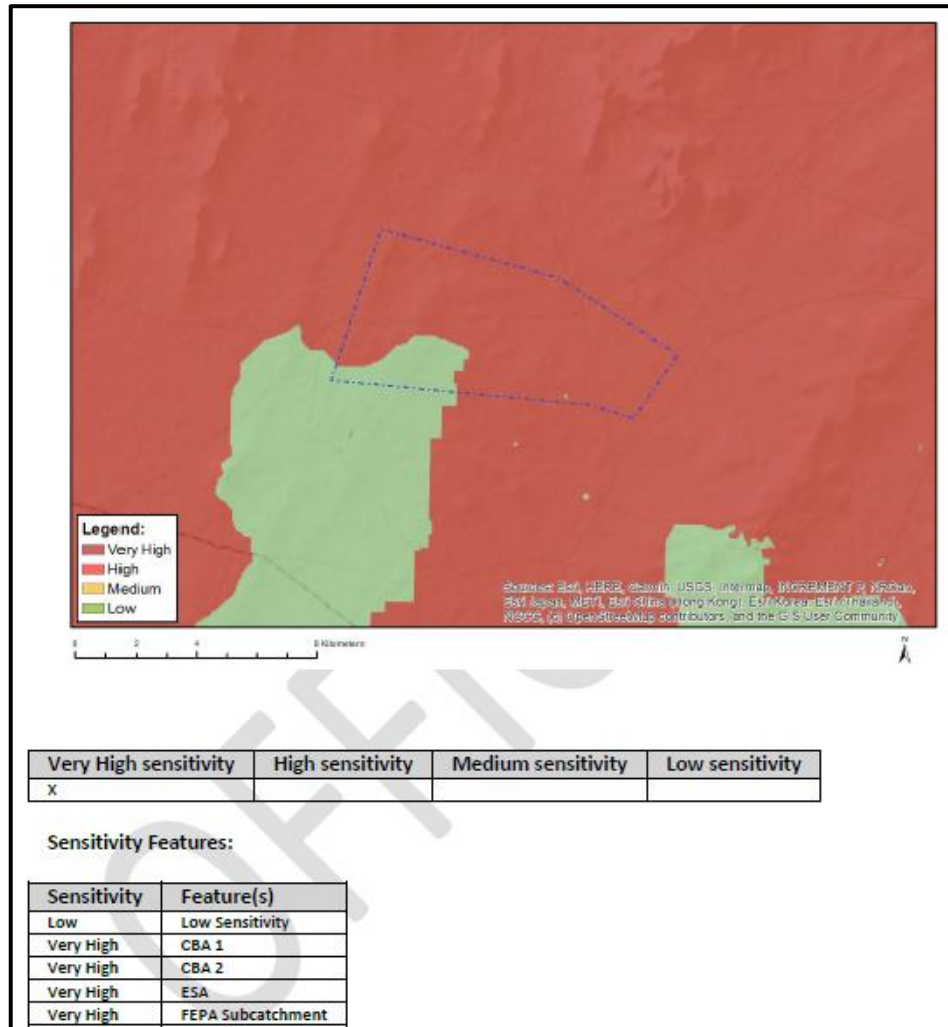


Figure 21: Terrestrial Biodiversity theme sensitivity of Bermolli No 583 according to the DFFE screening report.

The same applies to Engelsdraai No 221 where practically the whole farm is marked as a CBA. The drainage line that crosses through the farm Witdraai No 204 is an ESA, while the north-western section and a portion to the north of the farm Vaalwater No 84 is indicated as CBA.

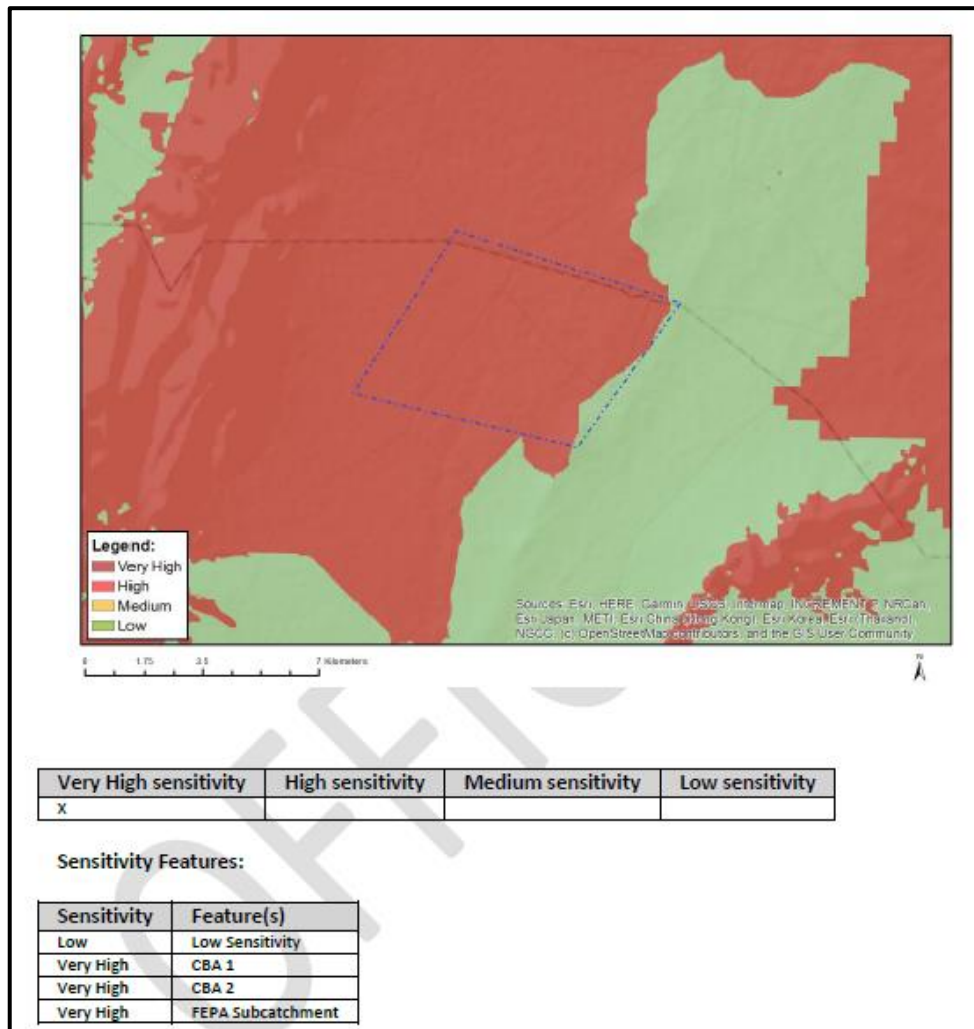


Figure 22: Terrestrial Biodiversity theme sensitivity of Engelsdraai No 221 according to the DFFE screening report.

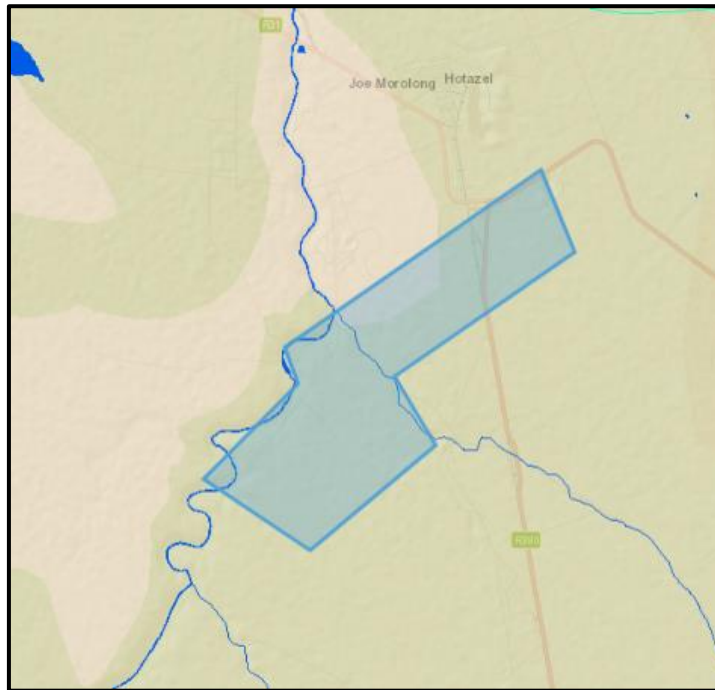


Figure 25: Map showing the distribution of the Kathu Bushveld (brown shading) as well as the Gordonia Duneveld (pink polygon) as depicted on the SANBI 2018 National Vegetation Map. The blue polygon represents the farms Botha No 313 (lower) and Devon No 277. (Image obtained from the BGIS Map Viewer: 2018 National Vegetation Map).

The vegetation types applicable to the farms Bermolli No 583, Engelsdraai No 221, Witdraai No 204 and Vaalwater No 84 include sections of the following:

- ❖ Kuruman Mountain Bushveld (SVk10),
- ❖ Northern Upper Karoo (NKu3),
- ❖ Olifantshoek Plains Thornveld (SVk13),
- ❖ Postmasburg Thornveld (SVk14),
- ❖ Southern Kalahari Salt Pans (Azi4).

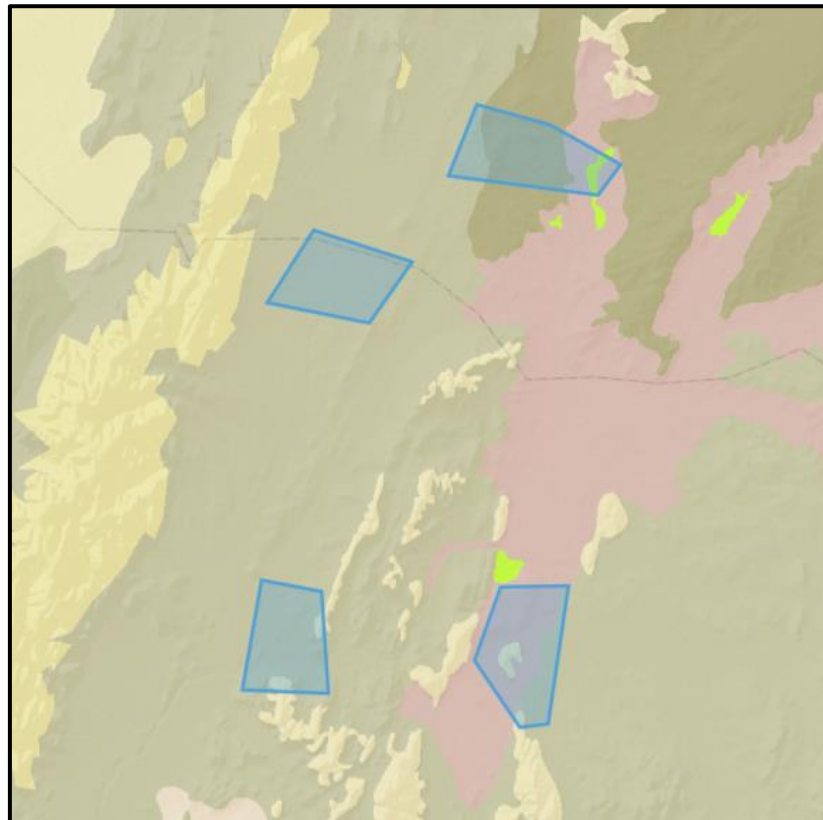


Figure 26: Map showing the distribution of the Olifantshoek Plains Thornveld (light brown), Postmasburg Thornveld (dark brown), Northern Upper Karoo (pink), Southern Kalahari Salt Pans (green), and the Kuruman Mountain Bushveld (sand colour) as depicted on the SANBI 2012 National Vegetation Map. The blue polygon represents the farms Bermolli No 583 (top), Engelsdraai No 221 (top-west), Witdraai No 204 (bottom-west), and Vaalwater No 84 (bottom). (Image obtained from the BGIS Map Viewer: 2018 National Vegetation Map).

Kathu Bushveld (SVk12)

The Kathu Bushveld occurs from the plains surrounding Kathu and Deben in the south through Hotazel to the Botswana border. The landscape associated with this vegetation type is mostly flat with some interspersed pans.

The main vegetation features include a medium-tall tree layer with mostly *Boscia albitrunca*, but also *Vachellia erioloba* in places, as the prominent trees. The shrub layer is generally most important with, for example, *Senegalia mellifera* subsp. *detinens*, *Diospyros lycioides* and *Lycium hirsutum*. The grass layer is variable in cover. The most important trees and shrubs are *Vachellia erioloba*, *Senegalia mellifera* subsp. *detinens*, *Boscia albitrunca*, *Diospyros lycioides* subsp. *lycioides*, *Grewia flava*, *G. retinervis*, *Gymnosporia buxifolia*, *Lycium hirsutum* and *Rhigozum brevispinosum*. Dominant and other grasses include *Aristida meridionalis*, *A. congesta*, *Brachiaria nigropedata*, *Centropodia glauca*, *Eragrostis lehmanniana*, *E. biflora*, *E. chloromelas*, *E. heteromera*, *E. pallens*, *Melinis repens*, *Schmidtia pappophoroides*, *S. kalahariensis*, *Stipagrostis ciliata*, *S. uniplumis* and *Tragus berteronianus*. Significant low shrubs and herbs are *Aptosimum*

decumbens, *Acrotome inflata*, *Erlangea misera*, *Gisekia africana*, *Heliotropium ciliatum*, *Hermbstaedtia fleckii*, *H. odorata*, *Limeum fenestratum*, *L. viscosum*, *Lotononis platycarpa*, *Nolletia arenosa*, *Senna italica*, *Sida cordifolia*, *Tragia dioica* and *Tribulus terrestris*.

The conservation status of this vegetation type is Least Threatened. Although conservation target of 16% is envisioned by conservation authorities, to date none of the vegetation type is statutorily conserved.

Gordonia Duneveld (SVkd1)

The Gordonia Duneveld is characterized by parallel dunes about 3 – 8 m above the plains. Open shrubland with ridges of grassland dominated by *Stipagrostis amabilis* on the dune crests and *Vachellia haematoxylon* on the dune slopes, also with *Senegalia mellifera* on lower slopes and *Rhigozum trichotomum* in the interdune straaen.

Some of the important taxa found in this vegetation type include *Senegalia mellifera* subs *detinens*, Tall Shrubs: *Grewia flava*, *Rhigozum trichotomum*, Low Shrubs: *Aptosimum albomarginatum*, *Monechma incanum*, Succulent Shrubs: *Lycium bosciifolium*, *L. pumilum*, *Talinum caffrum*. Graminoids: *Schmidtia kalahariensis*, *Brachiaria glomerata*, *Bulostylis hispidula*, *Eragrostis lehmanniana*, Herbs: *Hermbstaedtia fleckii*, *Acanthosicyos naudinianus*, *Tribulus zeyheri*.

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) approximately 14% is statutorily conserved in the Kgalagadi Transfrontier Park. Very little of the vegetation type has been transformed, and erosion is normally very low.

Kuruman Mountain Bushveld (SVk10)

The Kuruman Mountain Bushveld is characterized by rolling hills with generally gentle to moderate slopes and hill pediment areas with an open shrubveld with *Lebeckia macrantha* prominent in places.

Some of the important taxa found in this vegetation type include *Searsia lancea*, *S. pyroides*, *Diospyros austro-africana*, *Euclea crispa*, *E. undulate*, *Olea earopaea*, *Tarchonanthus camphoratus*, *Amphiglossa triflora*, *Anthospermum rigidum*, *Helichrysum zeyheri*; Graminoids: *Andropogon chinensis*, *Anthephora pubescens*, *Aristida congesta*, *Digitaria eriantha*, *Themeda triandra*. Biogeographically Important Taxa: *Lebeckia*

macrantha (Griqualand West endemics), *Tarchonanthus obovatus*, *Euphorbia wilmaniae*, *E. planiceps*, *Digitaria polyphylla*, *Sutera griquensis*.

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) none of it is conserved in statutory or private conservation areas. A conservation target of 16% was set for the vegetation type.

Northern Upper Karoo (NKu3)

The Northern Upper Karoo is a very wide unit that covers parts of the Northern Cape and Free State Provinces. The vegetation type is a shrubland dominated by dwarf karoo shrubs, grasses and *Senegalia mellifera* subs. *detinens* and some other low trees. The unit is flat to gentle sloping.

Some of the important taxa found in this vegetation type include *Senegalia mellifera* subs *detinens*, *Boscia albirunca*. Tall Shrubs: *Lycium cinereum*, *L. horridum*, *L. oxycarpum*, *Rhigozum trichotomum*, Low Shrubs: *Chrysocoma ciliata*, *Gnidia polycephala*, *Pentzia calcarean*, *Aptosimum marlothii*, *Eriocephalus eriocephalus* subsp *eriocoides*, *Euryops asparagoides*, *Limeum aethiopicum*, *Pentzia lanata*, *Zygophyllum lichtensteinianum*, Herbs: *Convolvulus sagittatus*, *Dicoma capensis*, *Gazania krebsiana*, *Radyera urens*, Graminoids: *Aristida adscensionis*, *A. congesta*, *Enneapogon desvauxii*, *Eragrostis lehmanniana*, *E. obtusa*, *Fingerhuthia africana*, *Themeda triandra*.

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) none is conserved in statutory conservation areas. *Prosopis* occurs in generally isolated patches, with densities ranging from very scattered to medium to localised closed woodland.

Olifantshoek Plains Thornveld (SVk13)

The Olifantshoek Plains Thornveld is a very wide and diverse unit on plains with usually open tree and shrub layers with for example *Vachellia luederitzii*, *Boscia albitrunca* and *Searsia tenuinervis*, and with a usually sparse grass layer.

Some of the important taxa found in this vegetation type include *Vachellia erioloba*, *Senegalia mellifera*, *Boscia albitrunca*, *Terminalia sericea*, *Lycium hirsutum*, *Rhigozum obovatum*, *Searsia tridactyla*, *Tarchonanthus camphoratus*, *Aptosimum procumbens*, *Grewia retinervis*, *Solanum tomentosum*. Graminoids: *Schmidtia papophoroides*, *Stipagrostis uniplumis*, *Aristida congesta*, *Digitaria eriantha*. Biogeographically Important

Taxa: *Vachellia luederitzii*, *Lebeckia macrantha*, *Hermannia burchelli*, *Justicia puberula*, *Tarchonanthus obovatus*.

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) only 0.3% is statutorily conserved in the Witsand Nature Reserve. Approximately 1% of the vegetation type has been transformed and the occurrence of erosion is very low. A conservation target of 16% was set for the vegetation type.

Postmasburg Thornveld (SVk14)

The vegetation and landscape features of the Postmasburg Thornveld is described as flats surrounded by mountains supporting open, shrubby thornveld characterised by dense shrub layer often lacking a tree layer, the grass layer is very sparse. Shrubs are generally low with a karroid affinity.

Some of the important taxa found in this vegetation type include *Vachellia erioloba*, *V. karroo*, *Searsia lancea*, *S. tridactyla*, *Ziziphus mucronata*, *Diospyros lycioides*, *Ehretia rigida*, *Tarchonanthus camphoratus*, *Grewia flava*, *Felicia muricata*, *Melolobium microphyllum*, *Sutera linariifolia*, Graminoids: *Digitaria eriantha*, *Enneapogon scoparius*, *Eragrostis lehmanniana*, *Aristida adscensionis*, *A. congesta*, *A. diffusa*. Biogeographically Important Taxa: *Euphorbia bergii*, *Digitaria polyphylla*.

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) none of it is conserved in statutory or private conservation areas. Very little of the vegetation type has been transformed and the occurrence of erosion is very low. A conservation target of 16% was set for the vegetation type.

Southern Kalahari Salt Pans (Azi4).

The vegetation and landscape features of the Southern Kalahari Salt Pans is described as low grasslands on pan bottoms (often devoid of vegetation) often dominated by *Sporobolus* species, with a mixture of dwarf shrubs. The low shrubland dominated by *Lycium* and/or *Rhigozum* usually forms the outer belt in the salt-pan zonation systems.

Some of the important taxa found in this vegetation type include the shrubs *Zygophyllum tenue*, *Salsola scopiformis*. Herbs: *Hirpicium gazanioides*, *Tribulus terrestris*. Succulent Herbs: *Trianthema triquetra* subsp. *parvifolia*. Graminoids: *Enneapogon desvauxii*, *Eragrostis truncata*, *Sporobolus coromandelianus*, *S. rangei*, *Panicum impeditum*.

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) about 8% is statutorily conserved in the Kgalagadi Transfrontier Park.

The vegetation of the pans is subject to natural degradation/regeneration cycles controlled by concentration of grazing animals.

Also refer to Part 2(h)(iv)(1)(c) *Description of specific environmental features and infrastructure on site – Site Specific Groundcover.*

FAUNA

The study area is mainly used for stock grazing with some game farming. Apart from the domestic animals, the indigenous faunal action of the area is high and shows a rich diversity with various protected species still present. The following faunal species faunal species are known to occur in/around the study area (non-exhaustive list):

Mammals:

- ❖ Aardvark (*Orycteropus afer*)
- ❖ Bat-eared Fox (*Otocyon megalotis*)
- ❖ Black-footed Cat (*Felis nigripes*) (VU)
- ❖ Bushveld Gerbil (*Gerbilliscus leucogaster*)
- ❖ Cape Fox (*Vulpes chama*)
- ❖ Cape Porcupine (*Hystrix africaeaustralis*)
- ❖ Desert Pygmy Mouse (*Mus indutus*)
- ❖ Ground Squirrel (*Xerus inauris*)
- ❖ Namaqua Rock Mouse (*Aethomys namaquensis*)
- ❖ Slender Mongoose (*Galerella sanguinea*)
- ❖ Smith's Red Rock Hare (*Pronolagus rupestris*)
- ❖ Southern Multimamate Mouse (*Mastomys coucha*)
- ❖ Springhare (*Pedetes capensis*)
- ❖ Steenbok (*Raphicerus campestris*)
- ❖ Yellow Mongoose (*Cynictis penicillata*)

Birds:

- ❖ African March-harrier (*Circus ranivorus*)
- ❖ Black Stork (*Ciconia nigra*)
- ❖ Burchell's Courser (*Cursorius rufus*)
- ❖ Chestnut-banded Plover (*Charadrius pallidus*)
- ❖ Kori Bustard (*Ardeotis kori*) (NT)
- ❖ Lanner Falcon (*Falco biarmicus*)
- ❖ Lappet-Faced Vulture (*Torgos tracheliotos*) (EN)
- ❖ Lesser Kestrel (*Falco naumanni*)

- ❖ Ludwig's Bustard (*Neotis ludwigii*) (EN)
- ❖ Martial Eagle (*Polemaetus bellicosus*) (VU)
- ❖ Secretary Bird (*Saggittarius sepentarius*) (VU)
- ❖ Sociable Weaver (*Philetairus socius*)
- ❖ Tawny Eagle (*Aquila rapax*) (VU)
- ❖ White-backed Vulture (*Gyps africanus*) (CR)
- ❖ Yellow-billed Stork (*Mycteria ibis*)

Invertebrates:

- ❖ Baboon Spiders
- ❖ Boomslang (*Dispholidus typus typus*)
- ❖ Burrowing Scorpions
- ❖ Cape Cobra (*Naja nivea*)
- ❖ Koringkriek (*Acanthopplus discoidalis*)
- ❖ Namaqua Plated Lizard (*Gerrhosaurus typicus*)
- ❖ Namaqua Sand Lizzard (*Pedioplanis namaquensis*)
- ❖ Puff Adder (*Bitis arietans*)
- ❖ Striped Skaapsteker (*Psammophylax tritaeniatus*)

HUMAN ENVIRONMENT

CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Heritage Impact Assessment for the Proposed Makganyane Prospecting Application, Postmasburg, Northern Cape Province, 2019 by HCAC – Heritage Consultants)

The archaeological record for the greater study area consists of the Stone Age and Iron Age.

Stone Age:

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age, and the Earlier Stone Age. The larger study area has a wealth of pre-colonial archaeological sites (Morris & Beaumont 2004). Famous sites in the region include the world renowned Wonderwerk Cave to the north of the study area. Closer to Kuruman two shelters on the northern and southern faces of GaMohaana (in the Kuruman Hills north-west of the town) contain Later Stone Age remains and rock paintings. Rock art is known to occur at Danielskuil to the north-east and on Carter Block (Morris 2008). Middle Stone Age material is on record around the study area.

According to Morris (2005) in the immediate area to the north of the study area, the Earlier Stone Age is represented by 11 known sites (Bruce, Kathu, Uitkoms, Sishen, Demaneng, Lylyveld and Mashwening); the Middle Stone Age by 5 sites (all in the vicinity of Kathu); and the Later Stone Age by 10 sites (one on King, one at Mashwening and eight at Kathu). Rock engravings have been identified from Sishen and Bruce (the Bruce site was salvaged and recorded by Fock & Fock 1984), as well as Beeshoek, to the east of the study area (Fock & Fock 1984; Morris 1992; Beaumont 1998). Specularite sources are known on Demaneng and Lylyveld and were mined in Stone Age times at a site on Doornfontein to the east of the study area (Beaumont 1973; Beaumont & Boshier 1974) and at Tsantsabane to the east of Postmasburg (Beaumont 1973; Thackeray et al. 1983): numerous other specularite workings have also been recorded (Beaumont 1973).

Iron Age:

Iron Age expansion southwards past Kuruman into the Ghaap plato and towards Postmasburg dates to the 1600's (Humphreys, 1976 and Thackeray, 1983). Definite dates for Tswana presence in the Postmasburg area are around 1805 when Lichtenstein visited the area and noted the mining activities of the Tswana (probably the Thlaping) tribes in the area. The Thlaro and Thlaping settled the area from Campbell in the east to Postmasburg and towards the Langeberg close to Olifantshoek in the north-west before 1770 (Snyman, 1988). The Korana expansion after 1770 started to drive the Thlaro and Thlaping further north towards Kuruman (Shillington, 1985); Morris (2005) indicated that three Iron Age sites close to the study area are on record (Demaneng, Lylyveld and Kathu).

Palaeontology:

The South African Heritage Resources Agency (SAHRA) compiled the Palaeontological (fossil) Sensitivity Map (PSM) to guide developers, heritage officers and practitioners in screening palaeontologically sensitive areas at the onset of a project. When the footprint of the earmarked properties are placed on the PSM, it shows that the farms extend over moderate (green) to high (orange) areas of concern as presented in the following figures.

**DIATOMITE / KIESELGUHR / DIATOMACEOUS EARTH PROSPECTING RIGHT
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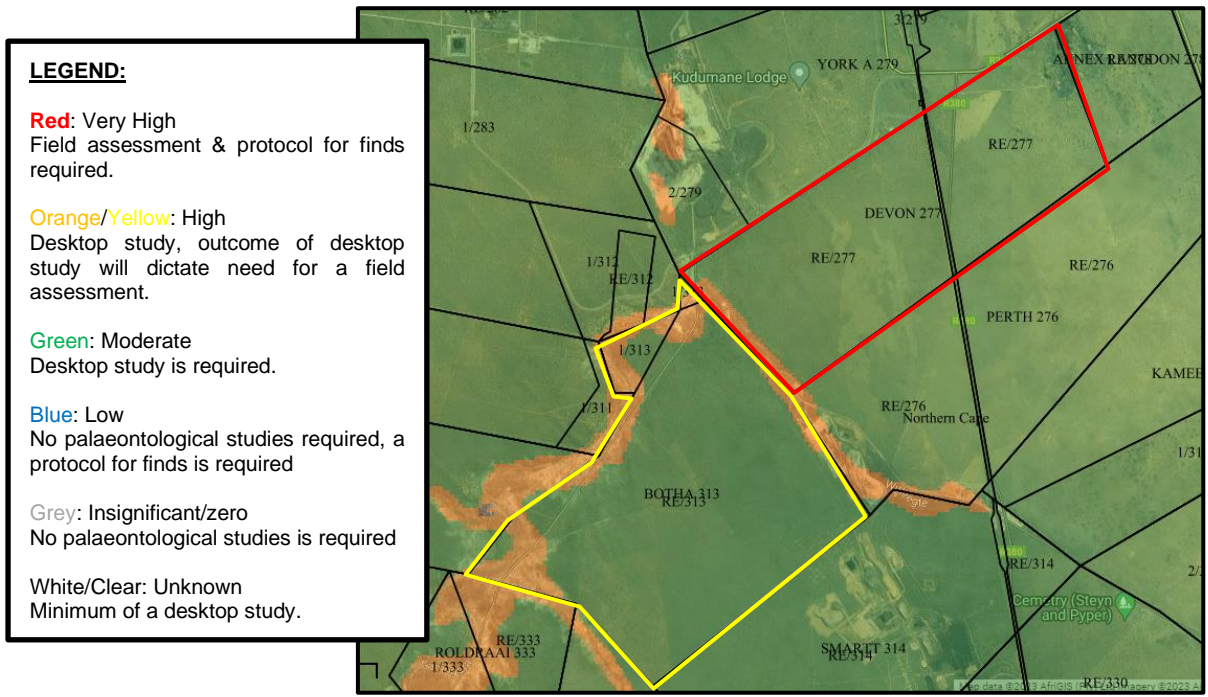


Figure 27: The farms Devon No 277 (red polygon) and Botha No 313 (yellow polygon) extends across areas of moderate – high concern according to the SAHRA palaeontological sensitivity map (image obtained from the PalaeoSensitivity Map on SAHRIS).

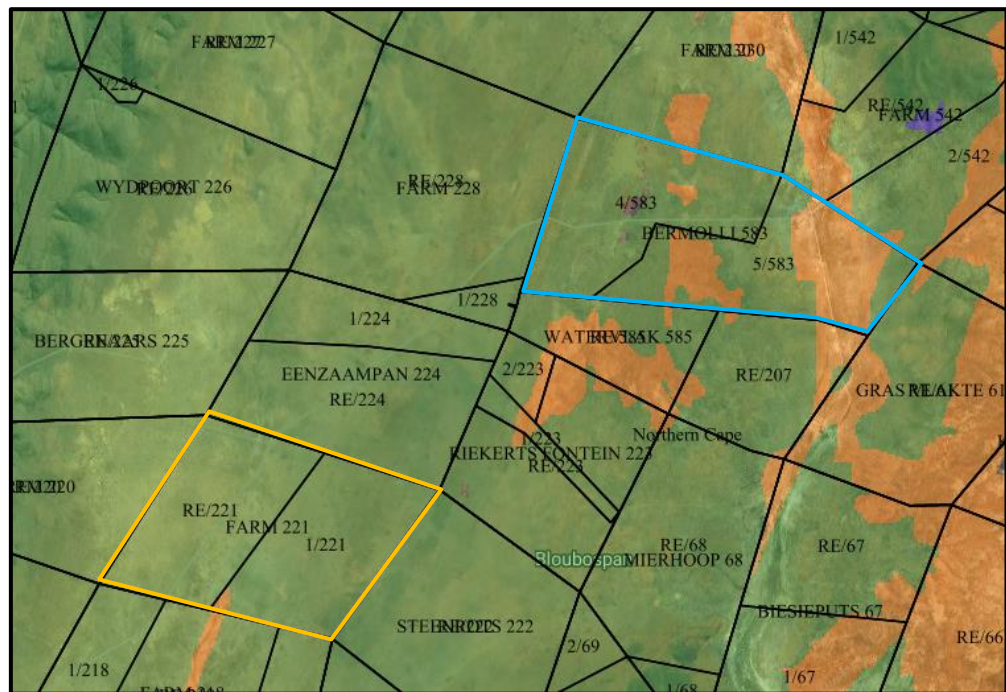


Figure 28: The farms Bermolli No 583 (blue polygon) and Engelsdraai No 221 (orange polygon) extends across areas of moderate – high concern according to the SAHRA palaeontological sensitivity map (image obtained from the PalaeoSensitivity Map on SAHRIS).

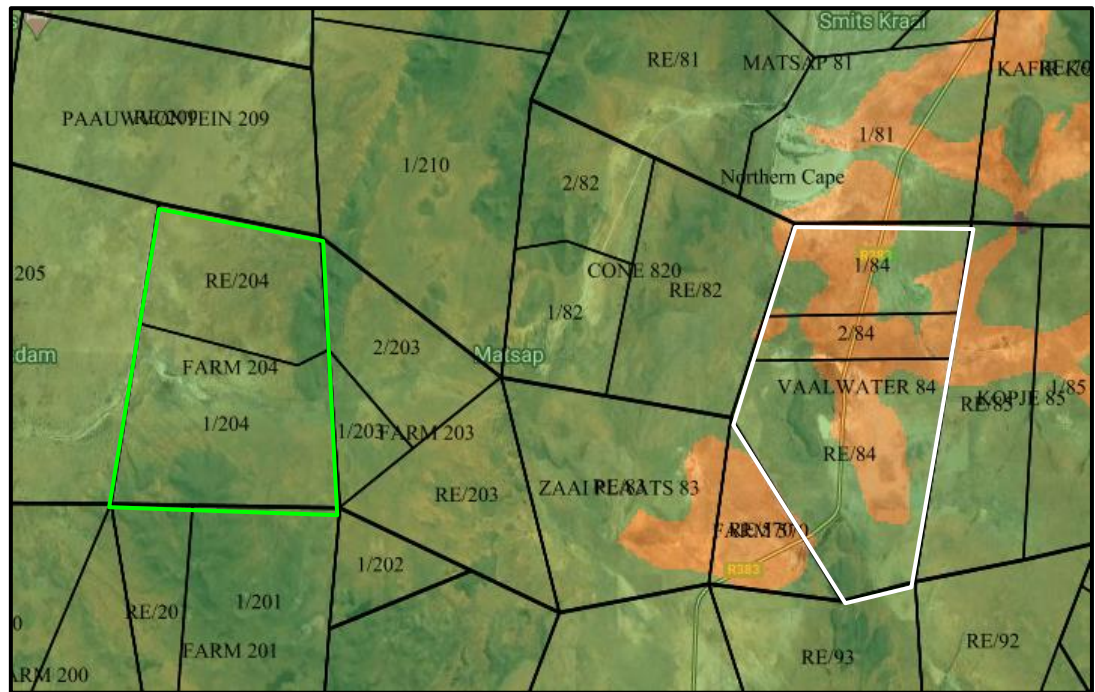


Figure 29: The farms Witdraai No 204 (green polygon) and Vaalwater No 84 (white polygon) extends across areas of moderate – high concern according to the SAHRA palaeontological sensitivity map (image obtained from the PalaeoSensitivity Map on SAHRIS).

An archaeologist and palaeontologist will be appointed to assess the cultural/heritage sensitivity of the study area. The findings of the specialists will be included into the DEIAR.

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Final IDP 2017 – 2022 John Taolo Gaetsewe District Municipality and the ZF Mgcawu District Municipality Draft Integrated Development Plan 2017- 2022 – Annual Review 2018/2019)

John Taolo Gaetsewe District Municipality

The farms Devon No 277 and Botha No 313 are within Ward 04 of the Joe Morolong Local Municipality (JMLM) that forms part of the John Taolo Gaetsewe District Municipality (JTGDM). The JTGDM is the second smallest district in the Northern Cape, occupying only 6% of the province. JMLM covers the second largest area of the district municipality. There are 186 towns and settlements of which the majority are villages in the JMLM.

The population of the JTGDM has had an increase of about 17 465; from 2011 to 2016. There has been a major decline of about 6.3% in the population of JMLM that is mainly due to the out-migration from the municipality to the Ga-Segonyana and Gamagara Local Municipalities.

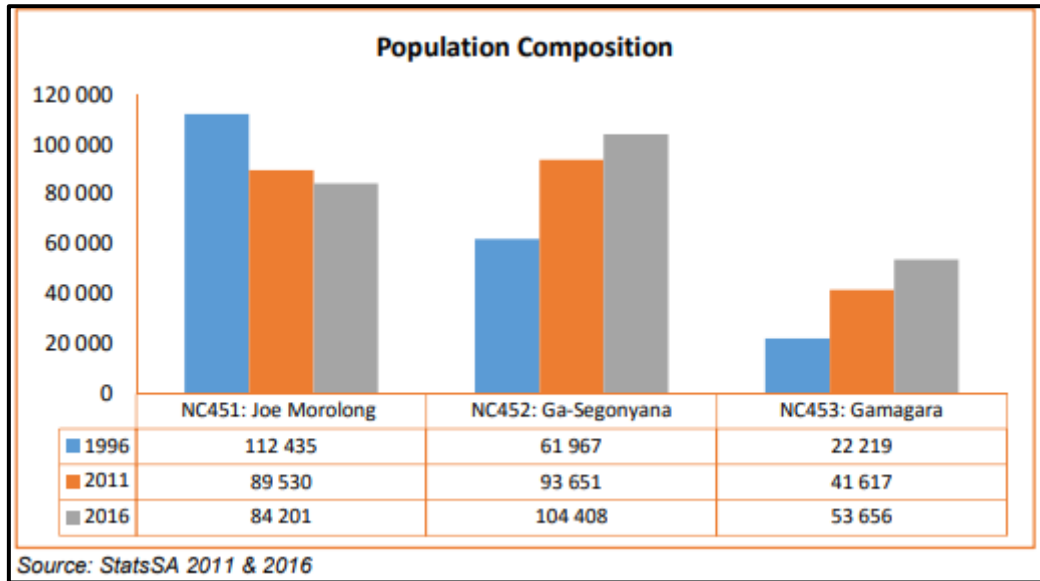


Figure 30: JTGDM population profile (image obtained from the JTGDM IDP).

According to the StatsSA 2016 Community Survey results, the age profile of the JTGDM is as follows: 0 - 14 years: 31.92%; 15 - 64 years: 63.32%; and older than 65: 4.76%. It is not that different from the national profile on Census 2011 (i.e. 0 - 14 years: 31.03%; 15 - 64 years: 63.59%; and older than 65: 5.39%). The figure above shows a generally youthful population between the age segment 15 – 36 of 100 973 people i.e. 41.68%.

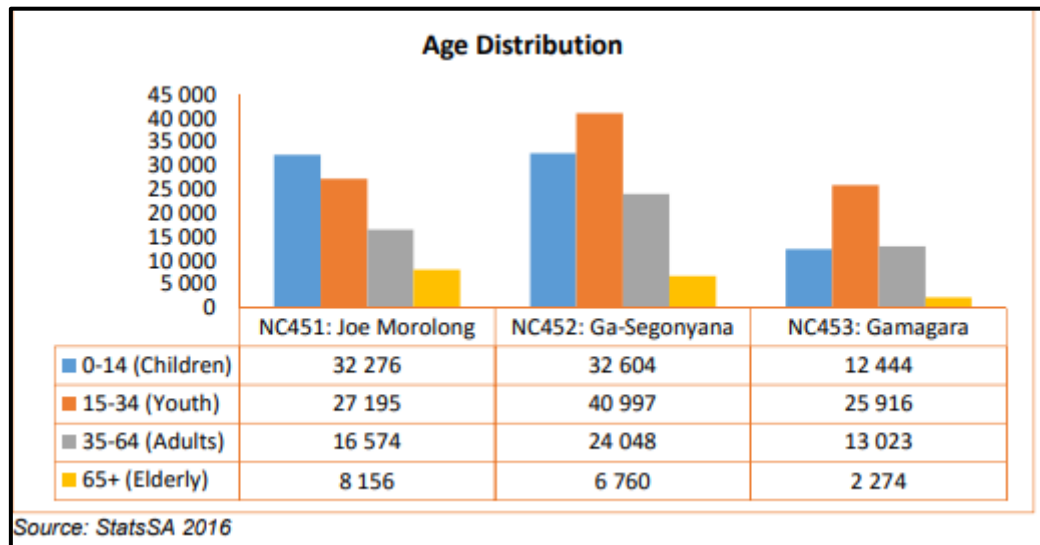


Figure 31: JTGDM age distribution profile (image obtained from the JTGDM IDP).

The gender split in the JTGDM is 49.12% male and 50.88% female. There is generally more females than males in all municipalities except for Gamagara; where there is more males than females, mainly because of the presence of job opportunities that attract men from other areas outside the district.

The racial profile of the JTGDM is as follows: Black/African: 83.52%; Coloured: 10.03%; Asian and Indian: 0.37%; White: 6.07%.

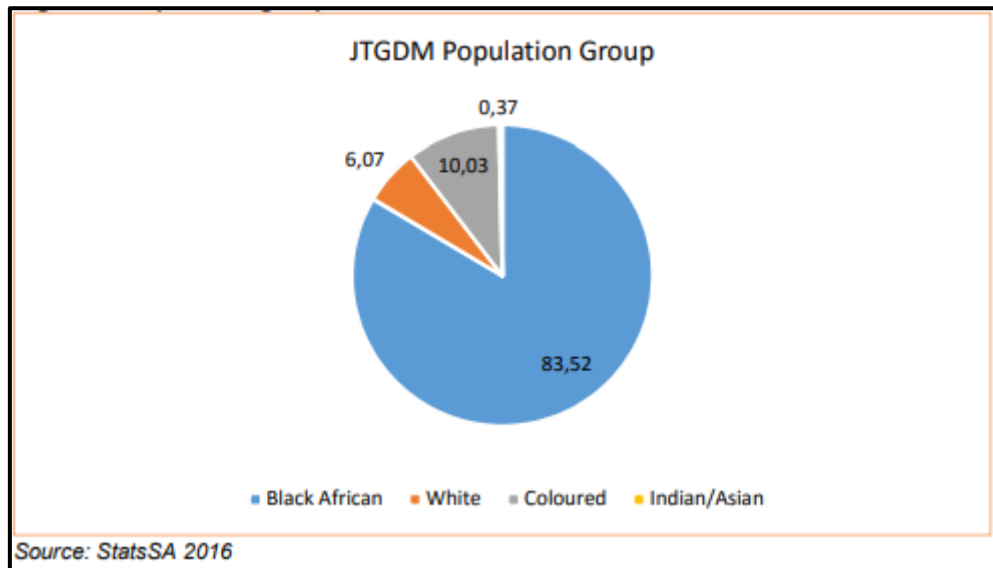


Figure 32: JTGDM population group profile (image obtained from the JTGDM IDP).

Most of the population in JTGDM have not attended any form of schooling (17.6%). Only 15.10% have completed high school (Grade 12) and a very few have completed some form of post-matric qualification.

In 2011, the District had an unemployment rate of 30%. However, this figure does include the discouraged work-seekers which will increase the unemployment rate to 47% if it were to be added. The Joe Morolong Municipality has the highest unemployment rate in the district of 40%.

ZF Mgcawu District Municipality

The farms Bermolli No 583, Engelsdraai No 221, Witdraai No 204 and Vaalwater No 84 are within wards 1 and 7 respectively of the Tsantsabane Local Municipality (TLM). The TLM is one of six local municipalities within the ZF Mgcawu District Municipality (ZFMDM) that is classified as a Category C municipality of the Northern Cape Province. The seat of the TLM is in Postmasburg with the municipal area including the towns/settlements of Boichoko, Postdene, New Town, Stasie, Groen Water, Skyfontein, Jean Heaven, Marenane, and Beeshoek.

According to the revised population estimates based on the 2011 (Statistics South Africa, 2011), the TLM has a population of 35 093 (compared to the 2001 Census estimate of 27 082). This population accounts for 12% of the total population residing in the ZF Mgcawu District, making it the third most populated local municipality in the district following the //Khara Hais Local Municipality and the Kai Garib Local Municipality. The TLM has a population growth rate of 2.59%, compared to the 17.8% growth rate of the ZFMDM. South

Africa is estimated to have an average annual growth rate of 1.4% which is less than that of TLM's growth rate.

Gender Profile

The Pie Chart below indicates that gender ratio in TLM is comprised of 52.3% males and 47.7% females (StatsSA). The age/sex distribution of the TLM shows the highest number of people in the TLM area between the age of 0 – 29 years of age.

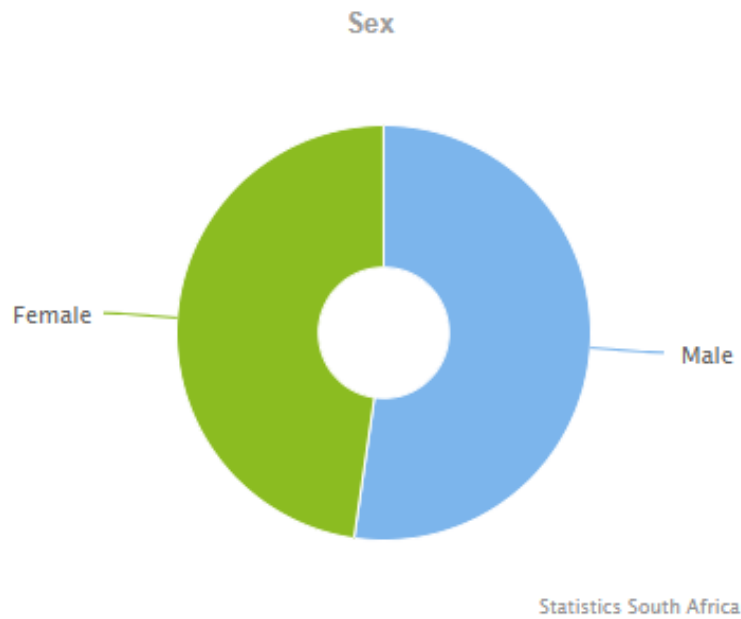


Figure 33: Gender profile (image obtained from Statistics South Africa).

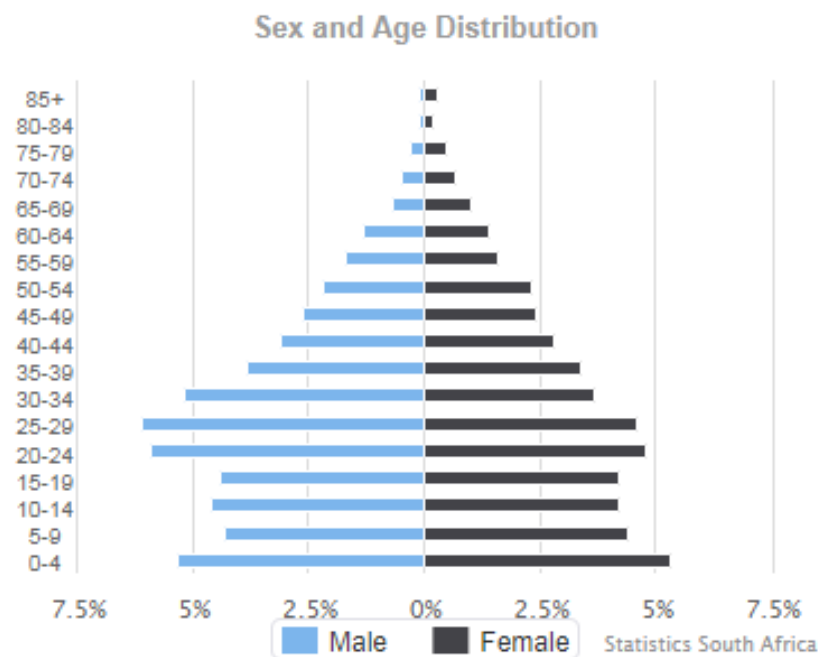


Figure 34: Gender and age distribution profile (image obtained from Statistics South Africa).

Population Profile

Below is a pie chart which indicates the total black African population of TLM at 52.8%, Coloured at 37.6%, Asian/Indian at 0.6% and White population at 8.4%. The Indian/Asian and others form the lowest proportions of the population with the former accounting for 0.6% and the latter 0.6%.

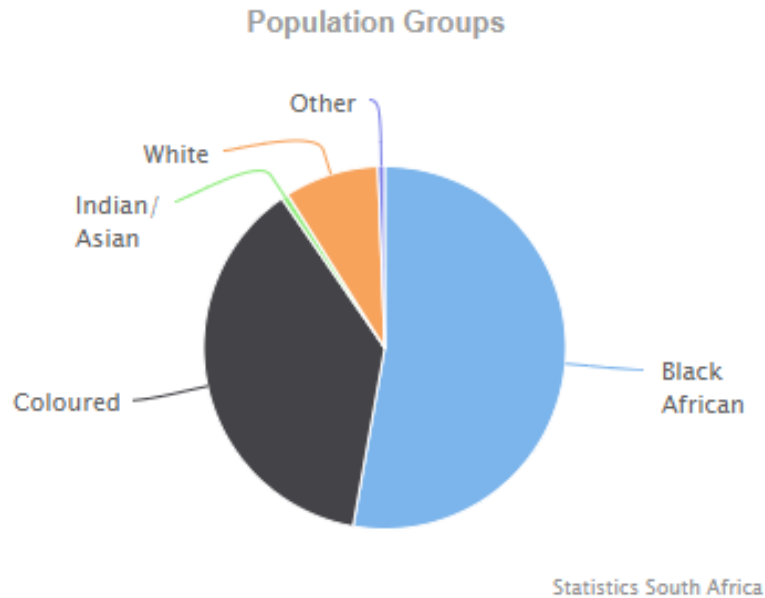


Figure 35: Population profile of the Tsantsabane municipal area (image obtained from Statistics South Africa).

Economic Profile

The TLM is well known for being rich in minerals, and for its mining, agriculture, manufacturing, and farming sectors. The construction of the Anglo American Kumba Iron Ore's Kolomela mine has bought an implosion of development to the area. Eighteen point five percent of the average household income of the TLM range between R 19 601 – R 38 200, followed by an average income of R 38 201 – R 76 400 at 16.5%, while 14.2% of the households registered an income of R 74 401 – R 153 800 as shown below.

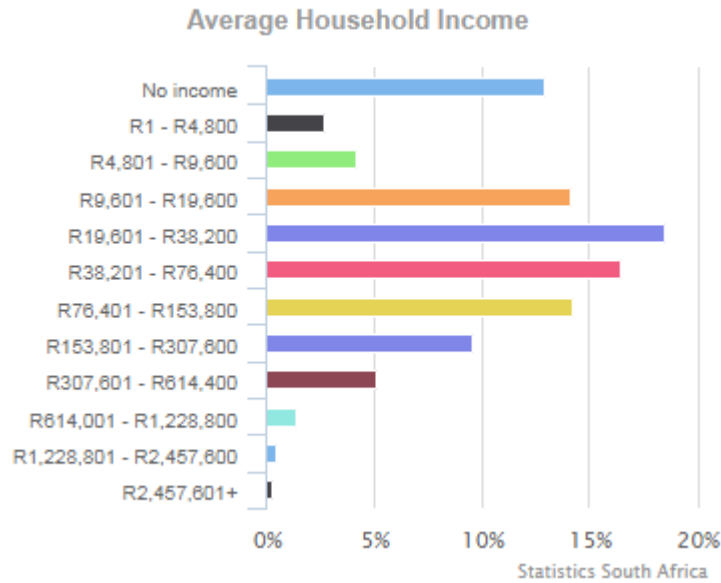


Figure 36: Average Household Income profile of the Tsantsabane municipal area (image obtained from Statistics South Africa).

The 2011 statistics showed a considerable decrease in the youth unemployment rate of the municipality from 43.1%, in 2001, to 32.3%. The average unemployment rate of the TLM decreased from 33.9% (2001) to 26.1% in 2011.

The ZFMDM accounts for 30% of the Northern Cape economy. As mentioned earlier, the economic activities of the TLM comprise of Agriculture, Livestock Farming, Irrigation Farming, Tourism & Heritage, Eco-adventures and Safaris, and Mining. The main agriculture related activity is livestock farming that occurs mainly on large farms, because of the low carrying capacity, where farming is extensive and mainly privately owned. The tourism industry is noted as the fastest growing component of the economy of the ZFMDM (2012 – 2017). Mining is one of the major sectors in the ZFMDM and is found in all municipalities. Within the TLM limestone, asbestos, iron, manganese, and gemstones (diamonds) are mined.

Education Levels

Thirteen point seven percent of the population above the age of 20 has no schooling, 25.3% has obtained matric and 6.3% obtained higher education. The matric rate increased from 16.7% in 2001 to 25.3% in 2011, the no schooling rate decreased from 24.2% to 13.7% and the Higher Education increased from 4.1% to 6.3%.

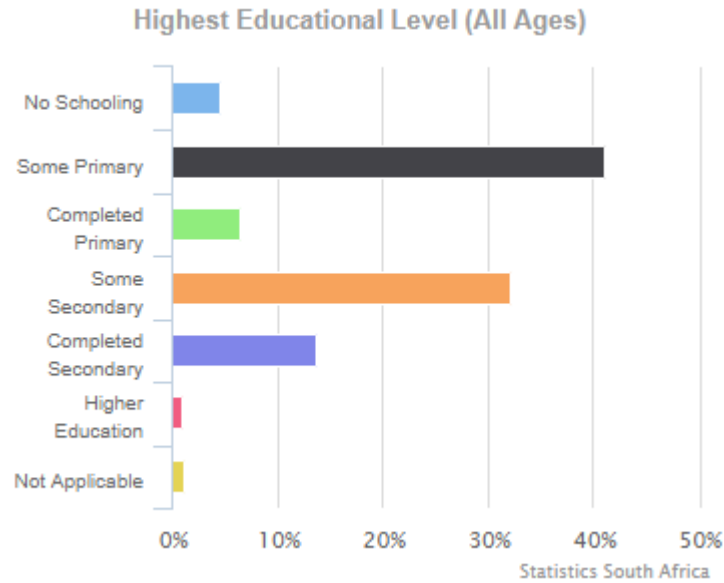


Figure 37: Average Household Income profile of the Tsantsabane municipal area (image obtained from Statistics South Africa).

(b) Description of the current land uses

The farms Botha No 313 and Devon No 277 are south of Hotazel with the R31 passing along the northern boundary of Devon No 277 and the R380 passing through the farm. Both these farms are surrounded by mining operations such as the old Devon Manganese Pit that extends into the north-eastern boundary of Devon No 277, the Kgalagadi Mine north-west of the farm and the Sebilo Mine south of Devon No 277 and north-east of Botha No 313. The United Manganese Mine is further south-east of Botha No 313. Both properties are presently used for agricultural (grazing) purposes although the properties are owned by mining companies (Kudumane Manganese Resources (KMR) & United Manganese of Kalahari (UMK) respectively). The surrounding land use includes agriculture, mining, transport (provincial roads & rail), as well as the town of Hotazel. Kudumane Lodge is ±1 km from the north-western boundary of Devon No 277.

The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of the two mentioned properties:

Table 9: Land uses and/or prominent features that occur within 500 m radius of the study area.

| LAND USE CHARACTER | YES | NO | DESCRIPTION |
|----------------------------|-----|----|---|
| Natural area | YES | - | The proposed footprint is surrounded by natural areas used for agricultural purposes. |
| Low density residential | - | NO | - |
| Medium density residential | - | NO | - |
| High density residential | - | NO | - |
| Informal residential | - | NO | - |

| LAND USE CHARACTER | YES | NO | DESCRIPTION |
|--|---|----|--|
| Retail commercial & warehousing | - | NO | - |
| Light industrial | - | NO | - |
| Medium industrial | - | NO | - |
| Heavy industrial | - | NO | - |
| Power station | - | NO | - |
| High voltage power line | YES | - | Powerlines associated with the railway are present in the area. |
| Office/consulting room | - | NO | - |
| Military or police base / station / compound | - | NO | - |
| Spoil heap or slimes dam | YES | - | The stockpiles and settling dams of the various mines are within 500 m of the earmarked farms. |
| Quarry, sand or borrow pit | YES | - | There are various mines within 500 m of the earmarked farms. |
| Dam or reservoir | YES | - | Various farm dams are within 500 m of the footprint area. |
| Hospital/medical centre | - | NO | - |
| School/ crèche | - | NO | - |
| Tertiary education facility | - | NO | - |
| Church | - | NO | - |
| Old age home | - | NO | - |
| Sewage treatment plant | - | NO | - |
| Train station or shunting yard | - | NO | - |
| Railway line | YES | - | The railway line is within 500 m of the farms. |
| Major road (4 lanes or more) | - | NO | - |
| Airport | - | NO | - |
| Harbour | - | NO | - |
| Sport facilities | - | NO | - |
| Golf course | - | NO | - |
| Polo fields | - | NO | - |
| Filling station | - | NO | - |
| Landfill or waste treatment site | - | NO | - |
| Plantation | - | NO | - |
| Agriculture | YES | - | The earmarked properties are used for agricultural purposes. |
| River, stream, or wetland | YES | - | The Witleegte and Ga-Mogara Streams pass the earmarked properties. |
| Nature conservation area | - | NO | - |
| Mountain, hill, or ridge | YES | - | Various low hills/ridges cross through the farms. |
| Museum | - | NO | - |
| Historical building | To be confirmed by the specialist during the EIA phase. | | |
| Protected Area | - | NO | - |
| Graveyard | YES | - | At least one grave was note on the farm Devon. |
| Archaeological site | To be confirmed by the specialist during the EIA phase. | | |
| Other land uses (describe) | - | NO | - |

A provincial gravel road leading to the Kolomela mine cuts through Bermolli No 583 and Engelsdraai No 221 before joining up with the N8 in the south. The land use of these two farms are mainly agriculture with small scale historic mining on Bermolli No 583. The Kolomela 2 Mine is ± 9 km north-east of Bermolli No 583. The land use is the same for the farms Witdraai No 204 and Vaalwater No 84. There are no established mines within proximity to these two properties. The R383 passes through the centre of Vaalwater No 84.

The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of the four mentioned properties:

Table 10: Land uses and/or prominent features that occur within 500 m radius of the study area.

| LAND USE CHARACTER | YES | NO | DESCRIPTION |
|--|-----|----|---|
| Natural area | YES | - | The proposed footprint is surrounded by natural areas used for agricultural purposes. |
| Low density residential | - | NO | - |
| Medium density residential | - | NO | - |
| High density residential | - | NO | - |
| Informal residential | - | NO | - |
| Retail commercial & warehousing | - | NO | - |
| Light industrial | - | NO | - |
| Medium industrial | - | NO | - |
| Heavy industrial | - | NO | - |
| Power station | - | NO | - |
| High voltage power line | - | NO | - |
| Office/consulting room | - | NO | - |
| Military or police base / station / compound | - | NO | - |
| Spoil heap or slimes dam | - | NO | - |
| Quarry, sand or borrow pit | YES | - | Some informal sand- and gravel borrow pits may occur on the farms. |
| Dam or reservoir | YES | - | Various farm dams are within 500 m of the footprint area. |
| Hospital/medical centre | - | NO | - |
| School/ crèche | - | NO | - |
| Tertiary education facility | - | NO | - |
| Church | - | NO | - |
| Old age home | - | NO | - |
| Sewage treatment plant | - | NO | - |
| Train station or shunting yard | - | NO | - |
| Railway line | - | NO | - |
| Major road (4 lanes or more) | - | NO | - |
| Airport | - | NO | - |
| Harbour | - | NO | - |
| Sport facilities | - | NO | - |
| Golf course | - | NO | - |

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| LAND USE CHARACTER | YES | NO | DESCRIPTION |
|----------------------------------|---|-----------|--|
| Polo fields | - | NO | - |
| Filling station | - | NO | - |
| Landfill or waste treatment site | - | NO | - |
| Plantation | - | NO | - |
| Agriculture | YES | - | The earmarked properties are used for agricultural purposes. |
| River, stream, or wetland | YES | - | Various unnamed drainage lines pass through the properties. The farms also has pans in some areas. |
| Nature conservation area | - | NO | - |
| Mountain, hill, or ridge | YES | - | Hills are especially prevalent on the farms Witdraai No 204 and Vaalwater No 84. |
| Museum | - | NO | - |
| Historical building | To be confirmed by the specialist during the EIA phase. | | |
| Protected Area | - | NO | - |
| Graveyard | YES | - | Family graveyards were noted on at least Engelsdraai No 221 and Vaalwater No 84. |
| Archaeological site | To be confirmed by the specialist during the EIA phase. | | |
| Other land uses (describe) | - | NO | - |

(c) Description of specific environmental features and infrastructure on the site**SPECIFIC ENVIRONMENTAL FEATURES****SITE SPECIFIC TOPOGRAPHY**

The topography of Devon No 277 gradually decreases from the highest north-eastern corner towards the lowest corner in the south-west as shown in the following figure. The mean elevation of the farm ranges from 1 082 amsl to 1038 amsl. As shown in the following figure the elevation gain of the farm is 25.5 m over 7.09 km (north-eastern to south-western corner), the elevation profile shows a maximum slope of 11.2% with an average slope of 1.0%.

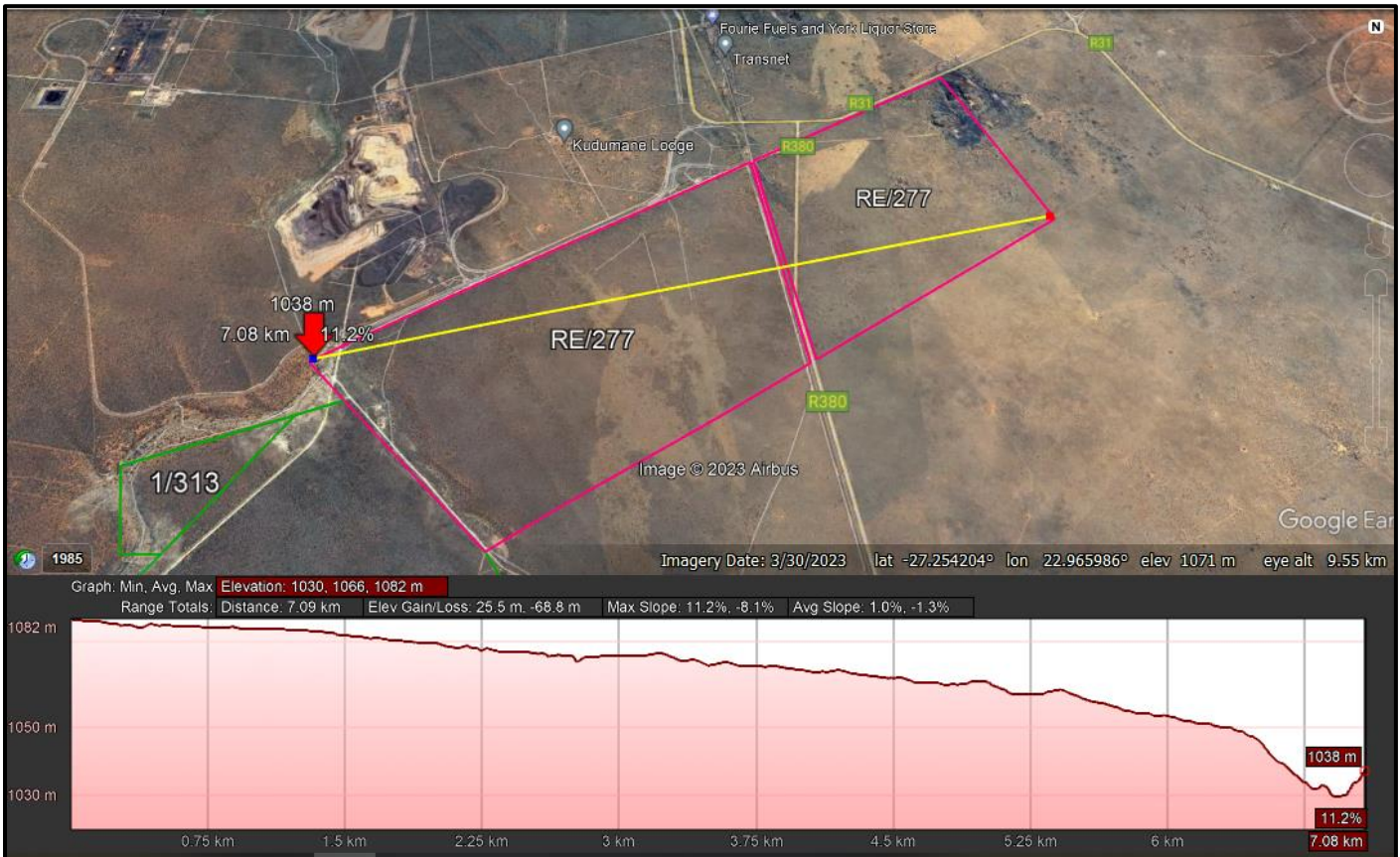


Figure 38: Elevation profile of the farm Devon No 277 (image obtained from Google Earth).

The topography of Botha No 313 gradually slopes from the higher laying south-eastern side down towards the Ga-Mogara stream along the north-western boundary as shown in the following figure. The mean elevation of the farm ranges from 1 070 amsl to 1035 amsl. As shown in the following figure the elevation gain of the farm is 54 m over 4.87 km (north-western boundary to the south-eastern one), the elevation profile shows a maximum slope of 12.7% with an average slope of 1.5%.

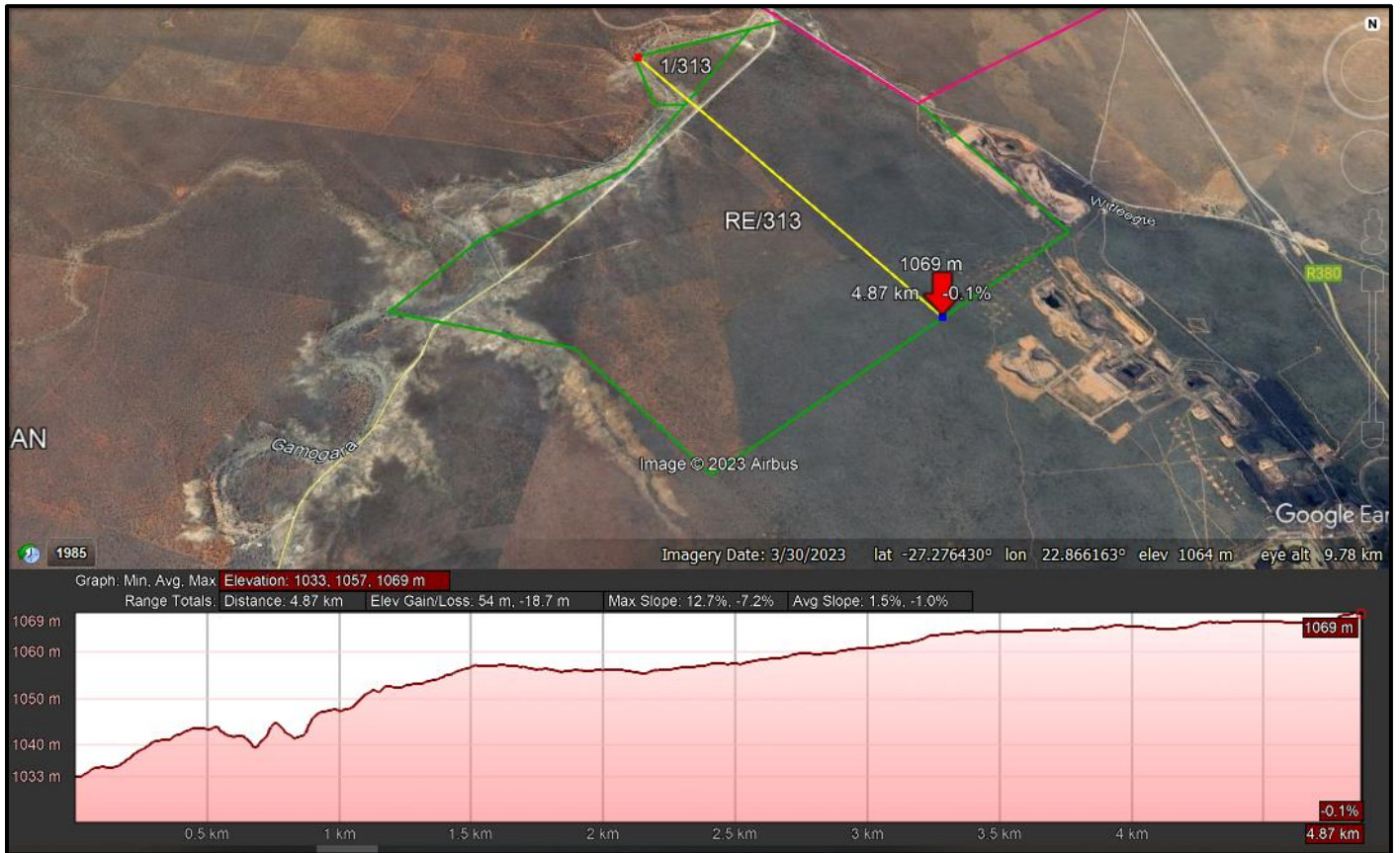


Figure 39: Elevation profile of the farm Botha No 313 (image obtained from Google Earth).

The topography of Bermolli No 583 gradually slopes from the higher laying north-western side down towards the drainage line that passes through the farm where after the landscape remains flat up to the eastern boundary as shown in the following figure. The mean elevation of the farm ranges from 1 220 amsl to 1 152 amsl. As shown in the following figure the elevation gain of the farm is 35.2 m over 9.15 km (north-western boundary to the eastern one), the elevation profile shows a maximum slope of 4.4% with an average slope of 1.1%.

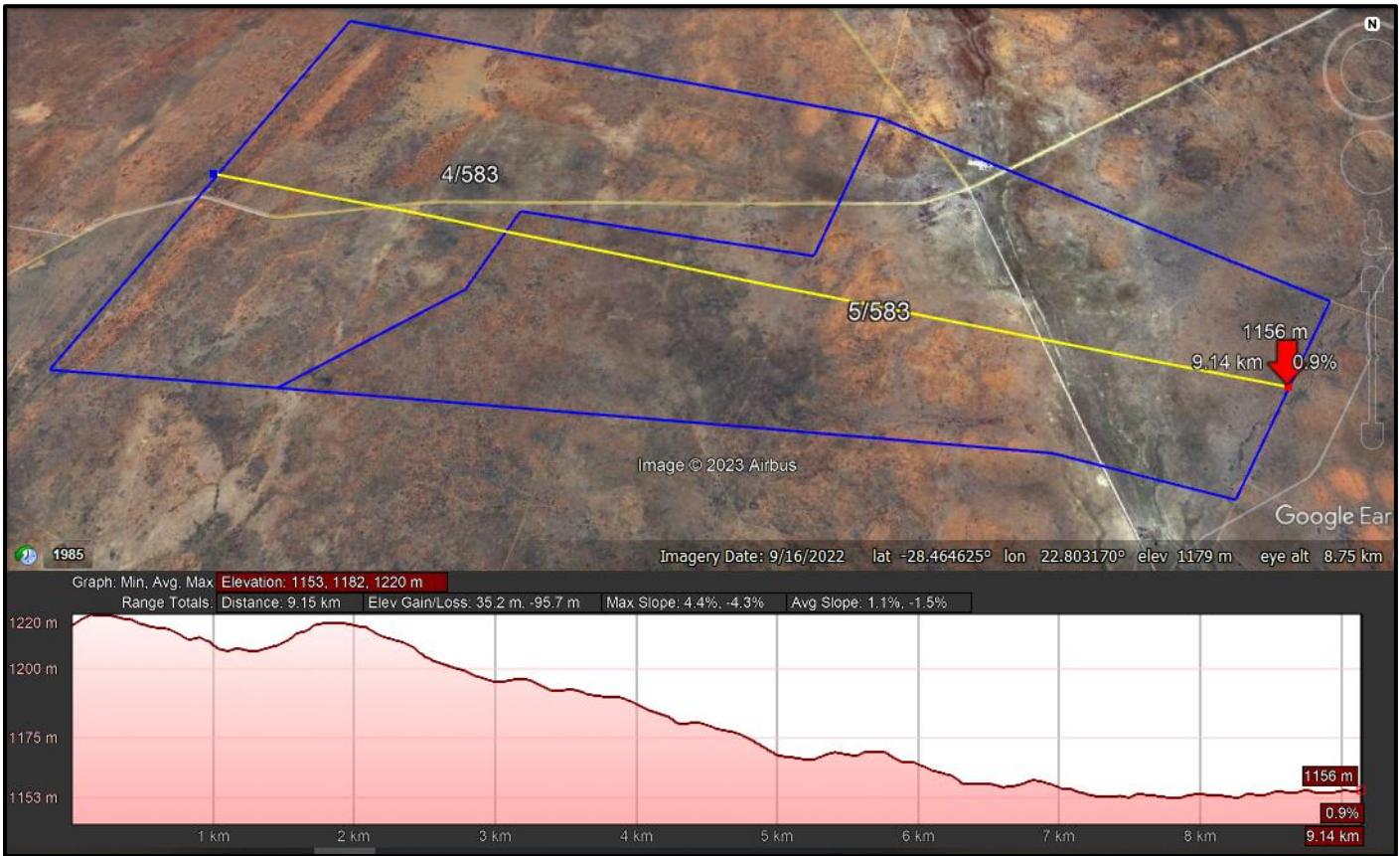


Figure 40: Elevation profile of the farm Bermolli No 583 (image obtained from Google Earth).

The topography of Engelsdraai No 221 is the highest at the south-eastern corner gradually sloping towards the drainage line in the middle of the property, whereafter the elevation remains relatively flat towards the north-western boundary as shown in the following figure. The mean elevation of the farm ranges from 1 209 amsl to 1 180 amsl. As shown in the following figure the elevation gain of the farm is 30.4 m over 6.54 km (south-western corner to the north-western one), the elevation profile shows a maximum slope of 3.6% with an average slope of 0.9%.

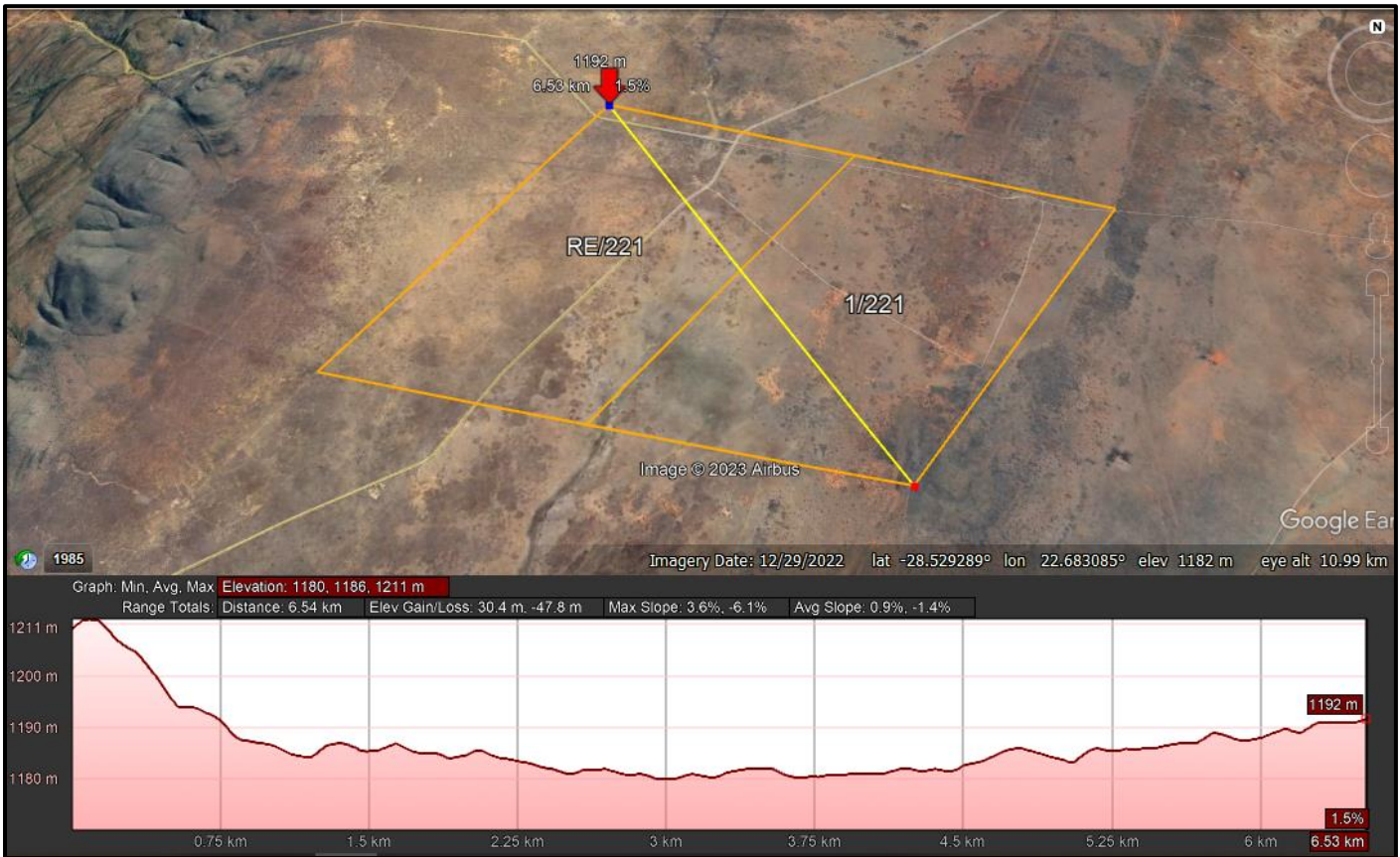


Figure 41: Elevation profile of the farm Engelsdraai No 221 (image obtained from Google Earth).

The topography of Witdraai No 204 remains relatively flat when measured from the north-western corner to the south-eastern one. Two ridges enter the property at the north-eastern and south-western corners respectively that natural increases elevation for the length of the ridge as shown in the following figure. The mean elevation of the farm (excluding the ridges) ranges from 1 109 amsl to 1 071 amsl. As shown in the following figure the elevation gain of the farm along this path is 75.2 m over 7.84 km (south-eastern corner to the north-western one), the elevation profile shows a maximum slope of 10.1% with an average slope of 1.5%.

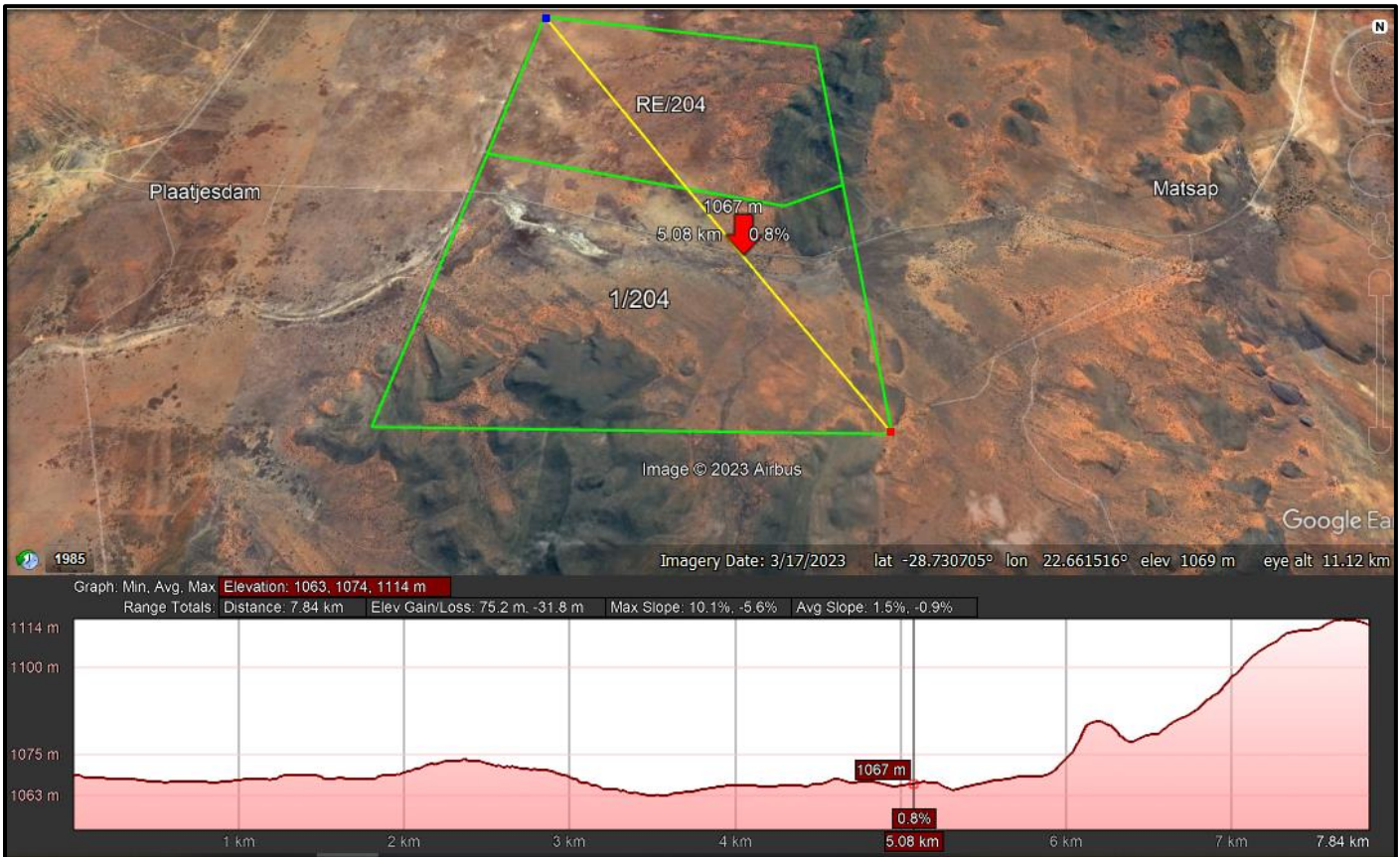


Figure 42: Elevation profile of the farm Witdraai No 204 (image obtained from Google Earth).

The topography of Vaalwater No 84 is relatively flat except for the hills to the south as shown in the following figure. The pans and surroundings remain more or less on the same elevation. The mean elevation of the farm (including the ridge to the south) ranges from 1 153 amsl to 1 101 amsl. As shown in the following figure the elevation gain of the farm along this path is 56.3 m over 15.5 km (southern corner, north-western corner and then to the western corner), the elevation profile shows a maximum slope of 2.6% with an average slope of 0.7%.

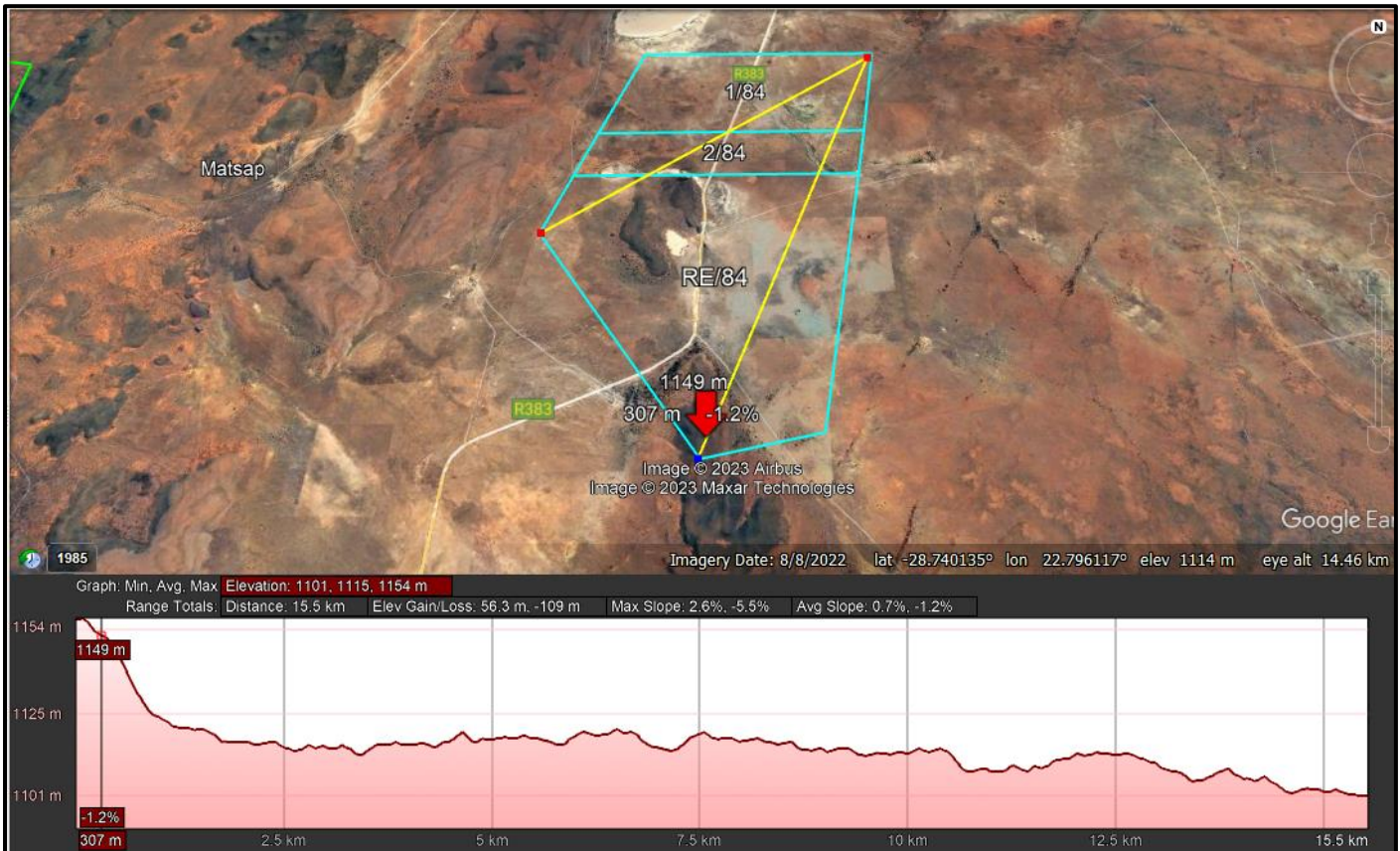


Figure 43: Elevation profile of the farm Vaalwater No 84 (image obtained from Google Earth).

SITE SPECIFIC VISUAL CHARACTERISTICS

This prospecting right application extends across 15 602.0765 ha and includes thirteen farms (Remainders & Portions). As mentioned above, the topography of the area is fairly flat with the exception of a few ridges that enter some of the properties. The study area is very scarcely populated, and some parts, especially near Hotazel, have already been altered for mining. As mentioned earlier, the area of disturbance is expected to be ± 200 m² per drill site and between 2 500 m² and 10 000 m² per bulk sampling area that will continuously be rehabilitated as prospecting progresses. The prospecting activities does not require the alteration of vast vegetated areas and no permanent infrastructure will be erected. Considering this, the potential impact of the prospecting operation on the visual characteristics of the receiving environment is deemed to be of low-medium importance without mitigation and low importance once the mitigation measures are implemented.

SITE SPECIFIC HYDROLOGY

The site specific hydrology of the proposed prospecting footprint is representative of the regional hydrology described for the study area earlier in this report (Scoping Report 2(h)(iv)(1)(a) Type of Environment Affected by the Proposed Activity – Hydrology). The DFFE Screening Report indicates most of the study area is of low aquatic biodiversity

importance except for the streams/drainage lines/pans, and FEPA's in the earmarked area as depicted in the following figure.



Figure 44: Aquatic biodiversity theme sensitivity of Devon No 277 according to the DFFE screening report where the Witleegte stream is of very high importance.

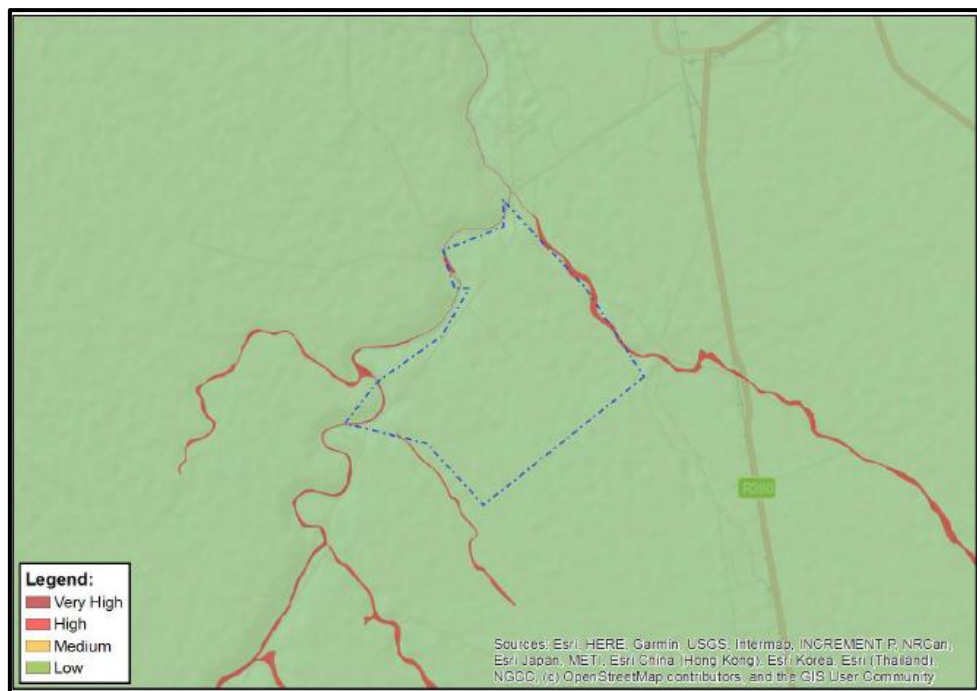


Figure 45: Aquatic biodiversity theme sensitivity of Botha No 313 according to the DFFE screening report where the Witleegte- and Ga-Mogara Streams are of very high importance.

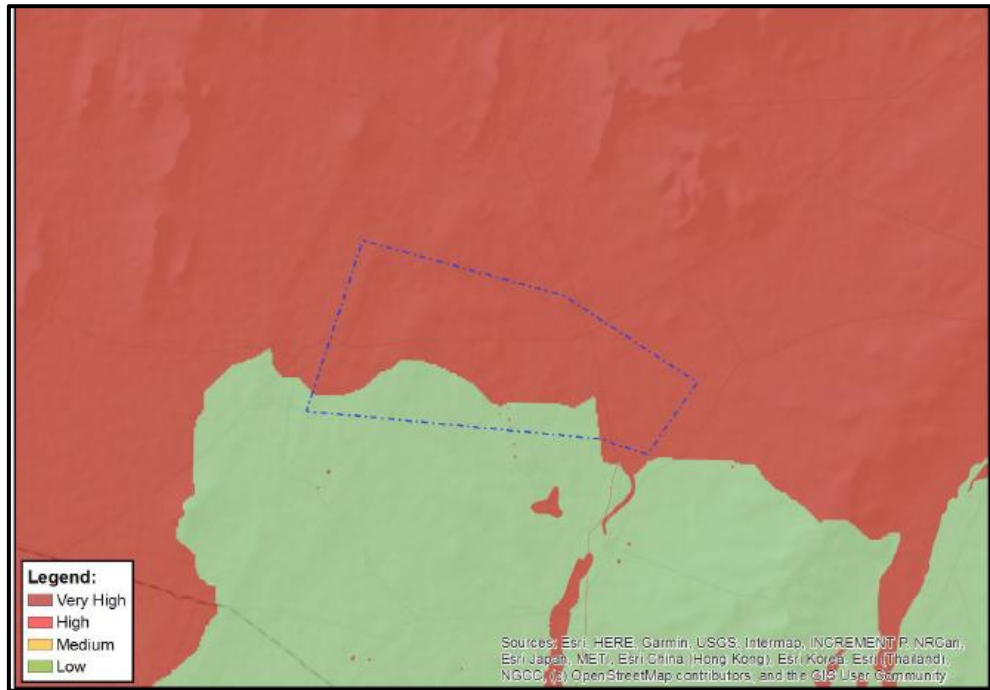


Figure 46: Aquatic biodiversity theme sensitivity of Bermolli No 583 according to the DFFE screening report where the FEPA area is of very high importance.

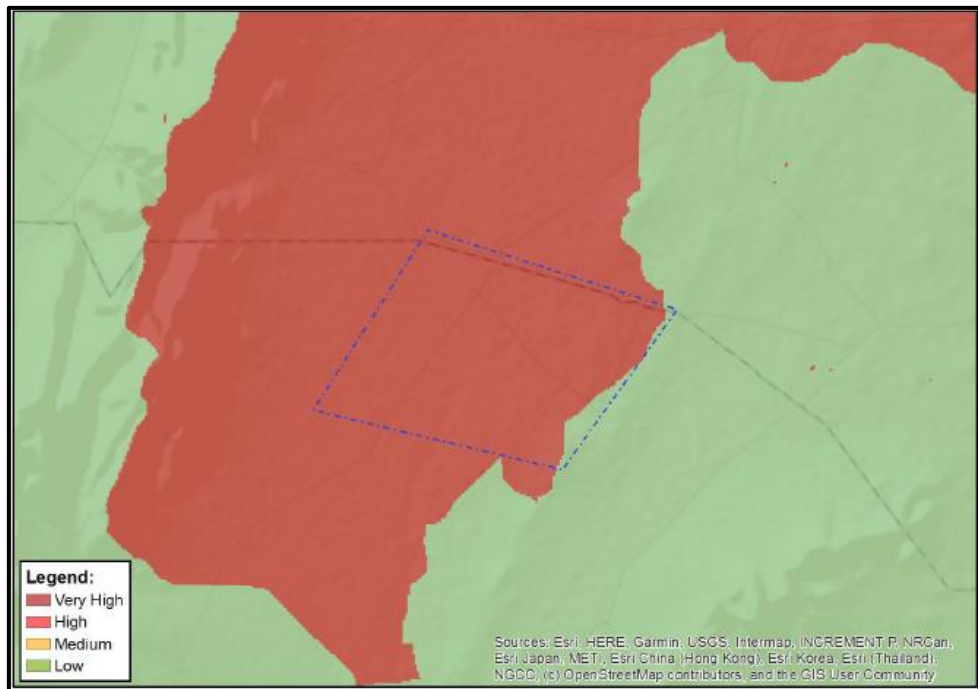


Figure 47: Aquatic biodiversity theme sensitivity of Engelsdraai No 221 according to the DFFE screening report where the FEPA area is of very high importance.

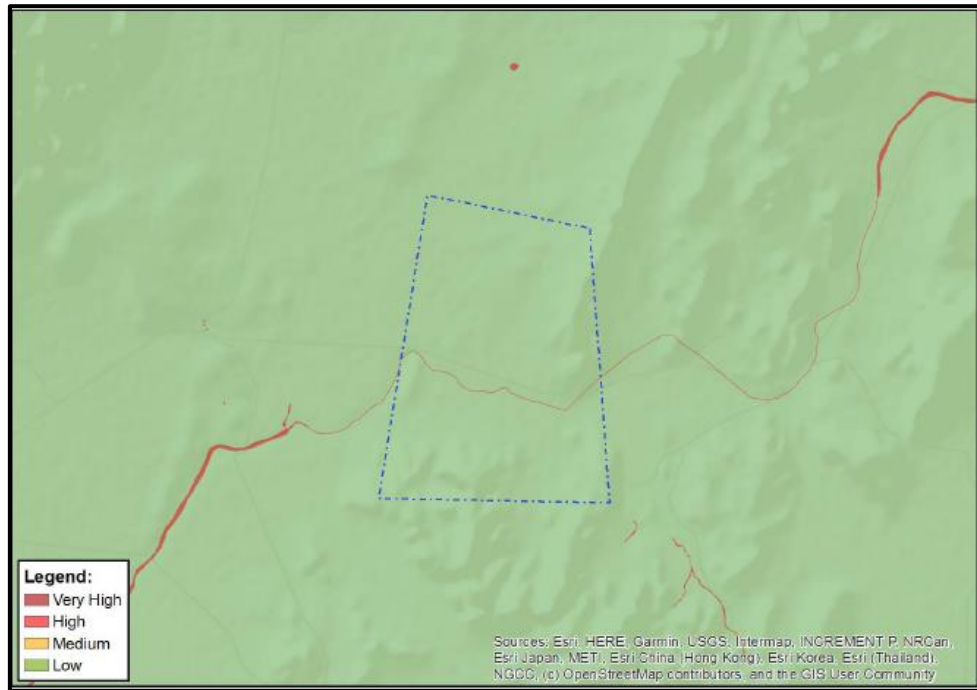


Figure 48: Aquatic biodiversity theme sensitivity of Witdraai No 204 according to the DFFE screening report where the drainage line is of very high importance.

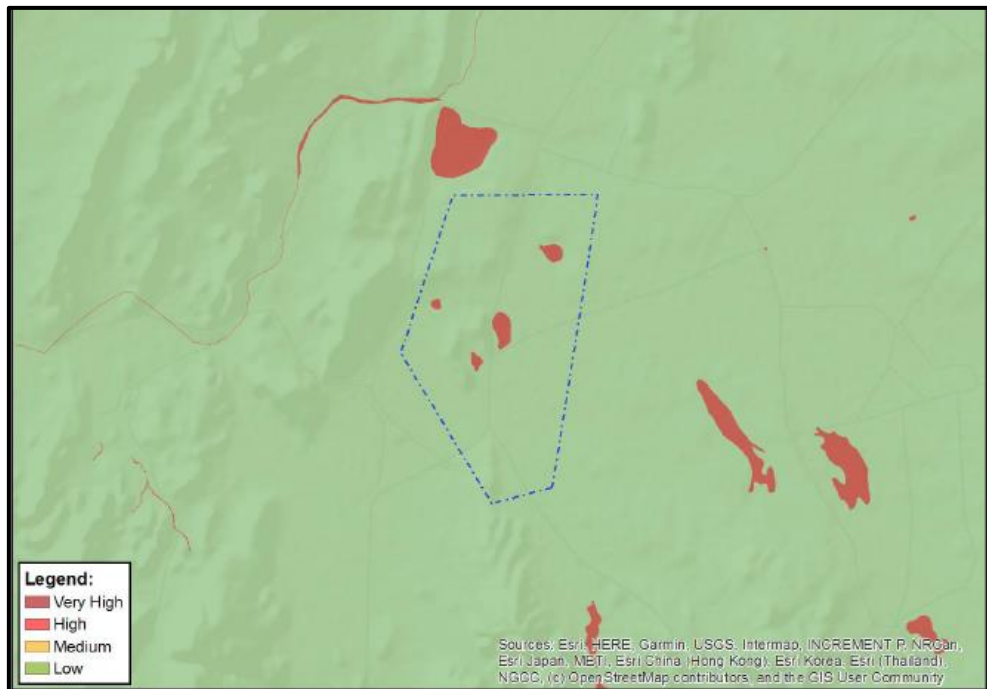


Figure 49: Aquatic biodiversity theme sensitivity of Vaalwater No 84 according to the DFFE screening report where the pans are of very high importance.

A hydrologist will be contracted to undertake a desktop Freshwater Assessment (wetland and aquatic) of the study area during the EIA process. The scope of work includes a desktop based investigation of the watercourses and wetlands within the study area supported by a site verification visit. The specialist will generate a desktop freshwater assessment report accompanied by a delineation and sensitivity map for the project to guide prospecting locations planning. The report will be compiled in accordance with the

requirements in the latest NEMA Minimum Requirements and Protocol for Specialist Aquatic Biodiversity Impact Assessment as contained in the “Procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes of Section 45 (a) and (h) of the National Environmental Management Act, 1998, when applying for Environmental Authorization”, contained in Government Gazette No. 43855 (30 October 2020) and the requirements of the Department of Water & Sanitation for Water Use Licensing, as outlined in the ‘Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals’ contained in the Government Gazette No. 40713 of 24 March 2017. The findings of this study will be discussed in the DEIAR upon approval of the FSR.

SITE SPECIFIC AIR QUALITY AND NOISE AMBIANCE

Emission into the atmosphere is controlled by the National Environmental Management: Air Quality Act, 2004, and the proposed operation will not trigger an application in terms of the said act. Emissions to be generated at the proposed prospecting areas will mainly consist of dust due to the displacement of soil, drilling, and transport of the samples from the site. Due to the small scale of the operation (per sample site) the noise levels to be generated will be low and will mainly stem from the operation of the prospecting equipment and vehicles traveling on the roads.

Presently the air quality and noise ambiance near the farms Devon No 277 and Botha No 313 are periodically impacted by the nearby mining operations of mines, as well as traffic along the R31 and R380. There are no occupied farm residences on either farm, and it is therefore currently believed that the dust emissions and/or noise levels that may arise from the proposed prospecting activities, if mitigated by the Applicant, will have a negligible impact on receiving environment.

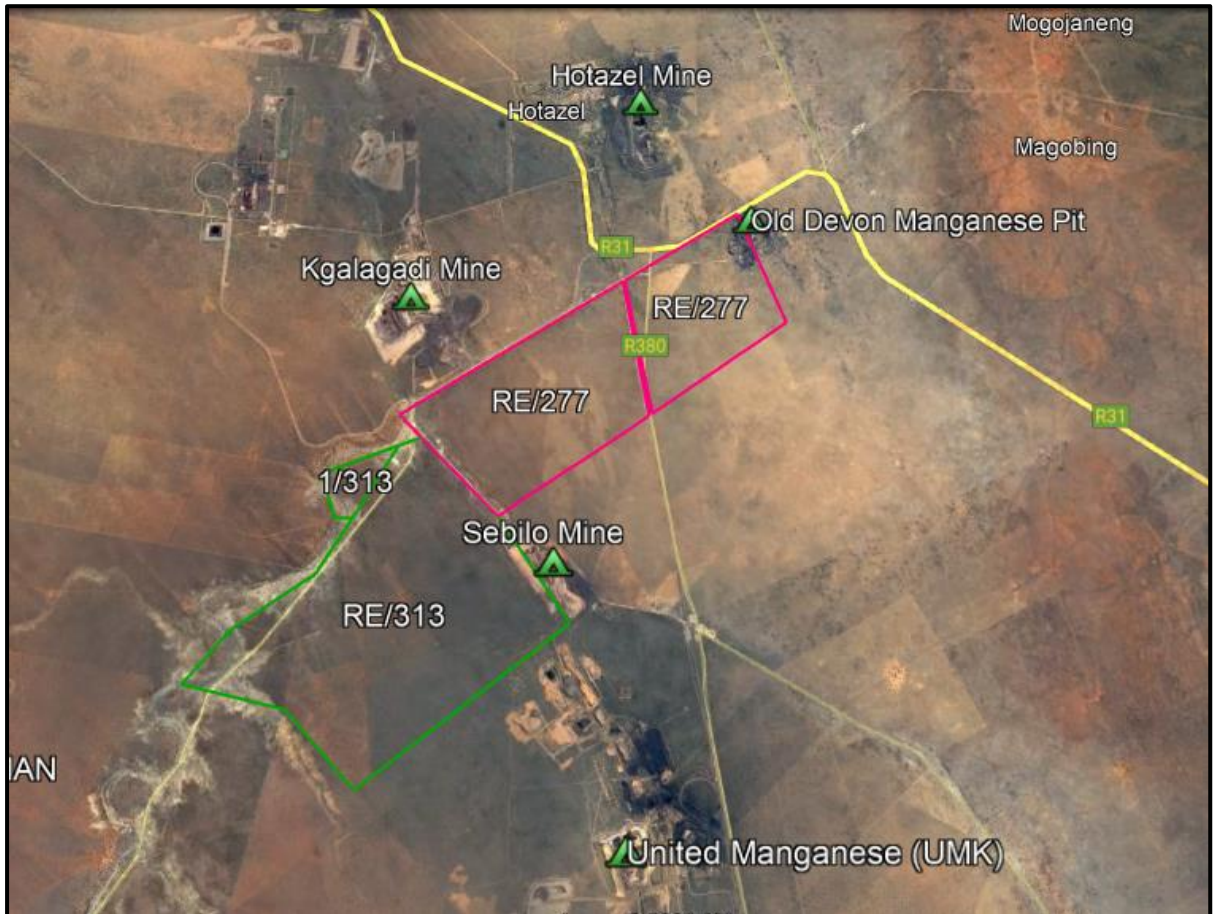


Figure 50: Satellite view of the mining operations bordering the farms Devon No 277 (pink polygon) and Botha No 313 (green polygon), also note the R31 and R380 in the vicinity of the farms. (Image obtained from Google Earth).

The air quality and noise ambiance of the farms Bermolli No 583, and Engelsdraai No 221 are impacted only by traffic travelling along the gravel road to Kolomela and the various farms. Apart from the said traffic, agricultural activities present the only other possible impact on these farms. This is also the case regarding Witdraai No 240 and Vaalwater No 84 where the main impact stems from agricultural practices and traffic along the R383 (in the case of Vaalwater No 84). Various farm residences are present on the earmarked farm as presented in the following figure, however if the dust emissions and/or noise levels that may arise from the proposed prospecting activities are mitigated by the Applicant, it is currently believed that the potential impact on the receiving environment will be of low significance.

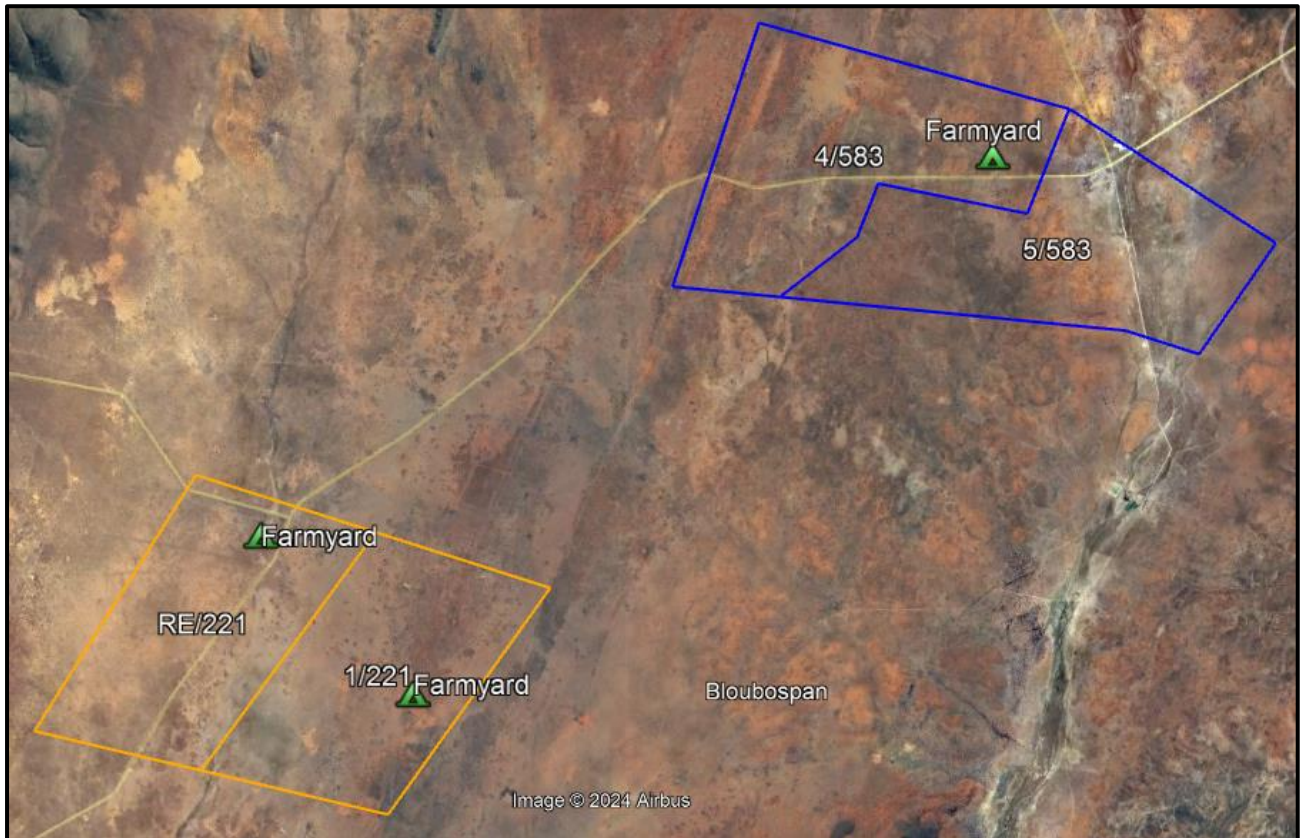


Figure 51: Satellite view of the farms Bermolli No 583 (blue polygon), and Engelsdraai No 221 (orange polygon) showing the farmyards and gravel road passing through the farms. (Image obtained from Google Earth).



Figure 52: Satellite view of the farms Witdraai No 204 (green polygon), and Vaalwater No 84 (light blue polygon) showing the farmyards and the R383 passing through Vaalwater No 84. (Image obtained from Google Earth).

The potential impact of the proposed activity on the air quality and noise ambiance of the receiving environmental will be assessed during the EIA process but as mentioned

previously the impact is expected to be of low significance. The DEIAR report will further propose mitigation and management measures to address/minimise identified impacts.

SITE SPECIFIC GROUNDCOVER AND BIODIVERSITY CONSERVATION AREAS

Following the earlier discussion in this regard and according to the DFFE screening tool; the proposed prospecting footprint extend over areas of CBA and ESA importance that is likely to feature Kathu Bushveld, Gordonia Duneveld, Kuruman Mountain Bushveld, Northern Upper Karoo, Olifantshoek Plains Thornveld, and/or Southern Kalahari Salt Pans.

Considering this, the project team guided by an ecologist will assess the sensitivity, and ground-truth the conservation status of the study areas. The findings will be presented in the desktop Terrestrial Biodiversity Report and discussed in detail in the draft environmental impact assessment report (DEIAR). The discussion will also propose mitigation and management measures to address/minimise the potential identified impacts.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

As mentioned earlier, an archaeologist and palaeontologist will be appointed to investigate the site specific cultural/heritage sensitivity of the study area. The findings of the specialists will be included into the DEIAR.

SITE SPECIFIC EXISTING INFRASTRUCTURE

As mentioned earlier, various farmyards occur within the proposed prospecting area, and the existing infrastructure component of the project therefore includes, but is not limited to, the following:

- ❖ Family graveyards;
- ❖ Fencing;
- ❖ Housing and supporting structures;
- ❖ Power and telephone lines;
- ❖ Railway lines;
- ❖ Roads (public as well as private);
- ❖ Stock pens;
- ❖ Water abstraction and storage infrastructure.

The proposed prospecting method is such that it can be moved away from build structures and existing infrastructure. As mentioned earlier, jeep-tracks to some of the prospecting

areas will be developed in agreement with the landowner, and presently it is not expected that the proposed activity will impact or necessitate the removal of any existing infrastructure.

(d) Environmental and current land use map

(Show all environmental, and current land use features)

The environmental and current land use map is attached as Appendix 4.

i) Impacts Identified

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

By nature, the non-invasive prospecting activities are not expected to have an impact on the receiving environment as it will occur off-site and at desktop level. However, the following potential impacts were identified regarding the invasive prospecting activities in each phase of the proposed project. The listed impacts must be treated as preliminary, to be expanded upon proper assessment of the study area during the EIA process. The significance rating was determined using the methodology as explained under *j) Methodology used in determining and ranking the significance of environmental impacts*. The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

INVASIVE PROSPECTING (PHASE 3 & 5): SITE ESTABLISHMENT

Temporary loss of agricultural land earmarked for site camp establishment.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|---------------------------|----------|--------|-------------|-------------|-----------|--------------------------------------|--------------|
| Rating: Low-Medium | | | | | | Degree of Mitigation: Partial | |
| 1 | 4 | 1 | 2 | 4 | 5 | 4.5 | 9 |

Visual intrusion because of site camp.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|---------------------------|----------|--------|-------------|-------------|-----------|--------------------------------------|--------------|
| Rating: Low-Medium | | | | | | Degree of Mitigation: Partial | |
| 2 | 4 | 1 | 2.3 | 3 | 5 | 4 | 9.2 |

Work opportunity for 15 - 20 community members (**Positive Impact**)

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|--------------------------------|----------|--------|-------------|-------------|-----------|----------------------------------|--------------|
| Rating: Medium-High (+) | | | | | | Degree of Mitigation: N/A | |
| 1 | 4 | 5 | 3.3 | 5 | 5 | 5 | 16.5 |

INVASIVE PROSPECTING (PHASE 3 & 5): OPERATIONAL PHASE

Temporary loss of some agricultural land earmarked for invasive prospecting.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|---------------------------|-------------|-----------|--------------------------------------|--------------|
| Rating: Medium | | | Site Alternative 1 | | | Degree of Mitigation: Partial | |
| 2 | 4 | 1 | 2.3 | 5 | 5 | 5 | 11.5 |

Visual intrusion because of invasive prospecting.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|--------------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Partial | |
| 2 | 4 | 2 | 2.6 | 5 | 5 | 5 | 13 |

Potential negative impact on the identified CBA and/or ESA areas.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|----------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium-High | | | | | | Degree of Mitigation: Full | |
| 4 | 4 | 3 | 3.6 | 4 | 5 | 4.5 | 16.2 |

Potential negative impact on the watercourses/wetlands and FEPA's of the study area.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|----------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium-High | | | | | | Degree of Mitigation: Full | |
| 4 | 4 | 3 | 3.6 | 4 | 5 | 4.5 | 16.2 |

Dust nuisance because of invasive prospecting.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 2 | 3 | 4 | 5 | 4.5 | 13.5 |

Noise nuisance because of invasive prospecting.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|--------------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Partial | |
| 2 | 4 | 2 | 2.6 | 4 | 5 | 4.5 | 11.7 |

Potential impact on sensitive/protected flora within the footprint area.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 4 | 4 | 5 | 4.3 | 3 | 2 | 2.5 | 10.7 |

Potential impact on fauna within the footprint area.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|---------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Low-Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 3 | 3.3 | 3 | 2 | 2.5 | 8.2 |

Infestation of the prospecting areas with invader plant species.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|---------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Low-Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 2 | 3 | 4 | 2 | 3 | 9 |

Potential soil contamination associated with littering and/or hydrocarbon spillages.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 4 | 4 | 1 | 3 | 4 | 3 | 3.5 | 10.5 |

Potential impact on areas/infrastructure of heritage or cultural concern.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|--------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Low | | | | | | Degree of Mitigation: Full | |
| 4 | 5 | 5 | 4.6 | 1 | 1 | 1 | 4.6 |

Erosion of denuded areas.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|---------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Low-Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 2 | 3 | 4 | 2 | 3 | 9 |

Deterioration of access roads due to prospecting activities.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 3 | 3.3 | 4 | 3 | 3.5 | 11.5 |

Health and safety risk posed by invasive activities to prospecting employees.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 4 | 4 | 1 | 3 | 3 | 5 | 4 | 12 |

Presence of prospector negatively affecting safety and security of the property.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|----------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium-High | | | | | | Degree of Mitigation: Full | |
| 4 | 4 | 4 | 4 | 3 | 5 | 4 | 16 |

Increased fire risk during operational phase.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 3 | 3.3 | 4 | 5 | 4.5 | 14.8 |

INVASIVE PROSPECTING (PHASE 3 & 5): DECOMMISSIONING (MEDIUM- & LONG TERM)

Safety risk due to uncapped boreholes and/or unrehabilitated bulk sampling pits/trenches.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 5 | 1 | 3 | 4 | 5 | 4.5 | 13.5 |

Potential impact associated with litter/hydrocarbon spillages left at the prospected areas.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 5 | 1 | 3 | 4 | 5 | 4.5 | 13.5 |

Erosion of roads, vehicle tracks and/or denuded areas.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|---------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Low-Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 5 | 2 | 3.3 | 4 | 2 | 3 | 9.9 |

Infestation of the reinstated areas with invader plant species.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|---------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Low-Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 5 | 2 | 3.3 | 4 | 2 | 3 | 9.9 |

Return of the site camp and prospected areas to agricultural use. **(Positive Impact)**

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|--------------------------------|----------|--------|-------------|-------------|-----------|----------------------------------|--------------|
| Rating: Medium-High (+) | | | | | | Degree of Mitigation: N/A | |
| 1 | 5 | 5 | 3.7 | 5 | 5 | 5 | 18.5 |

CUMULATIVE IMPACTS

Reduced ability to meet national conservation obligations and targets should CBA/ESA be affected.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|----------------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium-High | | | | | | Degree of Mitigation: Full | |
| 4 | 4 | 5 | 4 | 4 | 5 | 4.5 | 18 |

Loss and fragmentation of vegetation communities within the CBA/ESA ecosystems.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 4 | 3.6 | 2 | 5 | 3.5 | 12.6 |

Fragmentation of ecosystems affecting safe movement of faunal species.

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|-----------------------|----------|--------|-------------|-------------|-----------|-----------------------------------|--------------|
| Rating: Medium | | | | | | Degree of Mitigation: Full | |
| 3 | 4 | 4 | 3.6 | 2 | 5 | 3.5 | 12.6 |

Compensation of landowners during operational phase. **(Positive Impact)**

| Severity | Duration | Extent | Consequence | Probability | Frequency | Likelihood | Significance |
|--------------------------------|----------|--------|-------------|-------------|-----------|----------------------------------|--------------|
| Rating: Medium-High (+) | | | | | | Degree of Mitigation: N/A | |
| 1 | 4 | 4 | 3 | 5 | 5 | 5 | 15 |

j) Methodology used in determining the significance of environmental impacts.

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

Methodology for the assessment of the potential environmental, social and cultural impacts

DEFINITIONS AND CONCEPTS:

Environmental Significance:

The concept of significance is at the core of impact identification, evaluation, and decision-making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognized from the various interpretations:

- ❖ Environmental significance is a value judgment.
- ❖ The degree of environmental significance depends on the nature of the impact.
- ❖ The importance is rated in terms of both biophysical and socio-economic values.
- ❖ Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration, and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of consequences being realised (Environment Australia (1999) Environmental Risk Management).

Impact

The positive or negative effects on human well-being and / or the environment.

Consequence

The intermediate or outcome of an event or situation OR it is the result, on the environment, of an event.

Likelihood

A qualitative term covering both probability and frequency.

Frequency

The number of occurrences of a defined event in a given time or rate.

Probability

The likelihood of a specific outcome measured by the ratio of a specific outcome to the total number of possible outcomes.

Environment

Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation (ISO 14004, 1996).

Methodology that will be used

The environmental significance assessment methodology is based on the following determination:

$$\text{Environmental Significance} = \text{Overall Consequence} \times \text{Overall Likelihood}$$

Determination of Overall Consequence

Consequence analysis is a mixture of quantitative and qualitative information, and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of

determining the environmental significance in terms of consequence, the following factors were chosen: Severity/Intensity, Duration and Extent/Spatial Scale. Each factor is assigned a rating of 1 to 5, as described in the tables below.

Determination of Severity / Intensity

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment.

Table 11: Table to be used to obtain an overall rating of severity, taking into consideration the various criteria.

| Type of criteria | Rating | | | | |
|--|---|--|--|--|--|
| | 1 | 2 | 3 | 4 | 5 |
| Quantitative | 0-20% | 21-40% | 41-60% | 61-80% | 81-100% |
| Qualitative | Insignificant / Non-harmful | Small / Potentially harmful | Significant/ Harmful | Great/ Very harmful | Disastrous / Extremely harmful |
| Social/ Community response | Acceptable / I&AP satisfied | Slightly tolerable / Possible objections | Intolerable/ Sporadic complaints | Unacceptable / Widespread complaints | Totally unacceptable / Possible legal action |
| Irreversibility | Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible | Low cost to mitigate | Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact | High cost to mitigate | Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible |
| Biophysical (Air quality, water quantity and quality, waste production, fauna and flora) | Insignificant change / deterioration or disturbance | Moderate change / deterioration or disturbance | Significant change / deterioration or disturbance | Very significant change / deterioration or disturbance | Disastrous change / deterioration or disturbance |

Determination of Duration

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place.

Table 12: Criteria for the rating of duration.

| Rating | Description |
|--------|-------------------------------------|
| 1 | Up to ONE MONTH |
| 2 | ONE MONTH to THREE MONTHS (QUARTER) |
| 3 | THREE MONTHS to ONE YEAR |
| 4 | ONE to TEN YEARS |
| 5 | Beyond TEN YEARS |

Determination of Extent/Spatial Scale

Extent or **spatial scale** is the area affected by the event, aspect or impact.

Table 13: Criteria for the rating of extent / spatial scale.

| Rating | Description |
|--------|---|
| 1 | Immediate, fully contained area |
| 2 | Surrounding area |
| 3 | Within Business Unit area of responsibility |
| 4 | Within the farm/neighbouring farm area |
| 5 | Regional, National, International |

Determination of Overall Consequence

Overall consequence is determined by adding the factors determined above and summarized below, and then dividing the sum by 3.

Table 14: Example of calculating overall consequence.

| Consequence | Rating |
|--|------------|
| Severity | Example 4 |
| Duration | Example 2 |
| Extent | Example 4 |
| SUBTOTAL | 10 |
| TOTAL CONSEQUENCE: (Subtotal divided by 3) | 3.3 |

Determination of Likelihood:

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below.

Determination of Frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken.

Table 15: Criteria for the rating of frequency.

| Rating | Description |
|--------|---|
| 1 | Once a year or once/more during operation |
| 2 | Once/more in 6 Months |
| 3 | Once/more a Month |
| 4 | Once/more a Week |
| 5 | Daily |

Determination of Probability

Probability refers to how often the activity or aspect has an impact on the environment.

Table 16: Criteria for the rating of probability.

| Rating | Description |
|--------|---------------------------------------|
| 1 | Almost never / almost impossible |
| 2 | Very seldom / highly unlikely |
| 3 | Infrequent / unlikely / seldom |
| 4 | Often / regularly / likely / possible |
| 5 | Daily / highly likely / definitely |

Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarized below, and then dividing the sum by 2.

Table 17: Example of calculating overall likelihood.

| Consequence | Rating |
|--|-----------|
| Frequency | Example 4 |
| Probability | Example 2 |
| SUBTOTAL | 6 |
| TOTAL LIKELIHOOD (Subtotal divided by 2) | 3 |

Determination of Overall Environmental Significance:

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of **LOW, LOW-MEDIUM, MEDIUM, MEDIUM-HIGH** or **HIGH**, as shown in the table below.

Table 18: Determination of overall environmental significance.

| Significance or Risk | Low | Low-Medium | Medium | Medium-High | High |
|--|---------|------------|-----------|-------------|---------|
| Overall Consequence X Overall Likelihood | 1 - 4.9 | 5 - 9.9 | 10 - 14.9 | 15 – 19.9 | 20 - 25 |

Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritizations and decision making process associated with this event, aspect, or impact.

Table 19: Description of environmental significance and related action required.

| Significance | Low | Low-Medium | Medium | Medium-High | High |
|------------------|---|---|---|---|--|
| Impact Magnitude | Impact is of very low order and therefore likely to have very little real effect. Acceptable. | Impact is of low order and therefore likely to have little real effect. Acceptable. | Impact is real, and potentially substantial in relation to other impacts. Can pose a risk to company | Impact is real and substantial in relation to other impacts. Pose a risk to the company. Unacceptable | Impact is of the highest order possible. Unacceptable. Fatal flaw. |
| Action Required | Maintain current management measures. Where possible improve. | Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where possible improve | Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible. | Improve management measures to reduce risk. | Implement significant mitigation measures or implement alternatives. |

Based on the above, the significance rating scale has been determined as follows:

- HIGH** Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.
- MEDIUM-HIGH** Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
- MEDIUM** Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible. In case of positive impacts; other means of achieving these benefits would be about equal in time, cost, and effort.
- LOW-MEDIUM** Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.

LOW Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap, and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or several ways, than this means of achieving the benefit.

INSIGNIFICANT There would be a no impact at all – not even a very low impact on the system or any of its parts.

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

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

PRELIMINARY LIST OF POSITIVE IMPACTS ASSOCIATED WITH THE PROJECT PROPOSAL

- ❖ If approved the prospecting activities will identify the kieselguhr sources within the earmarked area.
- ❖ Work opportunities for 15 - 20 community members including associated growth development opportunities.
- ❖ Compensation of landowners during operational phase.
- ❖ Return of the site camp and prospected areas to agricultural use.
- ❖ Identified kieselguhr sources could lead to economic development of the earmarked areas.

PRELIMINARY LIST OF NEGATIVE IMPACTS ASSOCIATED WITH THE PROJECT PROPOSAL

The following table lists the potential negative impacts associated with the present project proposal:

Table 20: List of potential negative impacts associated with the present project proposal.

| ACTIVITY | POTENTIAL IMPACT | SIGNIFICANCE (BEFORE MITIGATION) |
|---|--|--|
| <ul style="list-style-type: none"> ❖ Site establishment. ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Temporary loss of agricultural land earmarked for site camp establishment. ❖ Temporary loss of some agricultural land earmarked for invasive prospecting. | <ul style="list-style-type: none"> ❖ Low-Medium ❖ Medium |
| <ul style="list-style-type: none"> ❖ Site establishment. ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Visual intrusion because of site camp. ❖ Visual intrusion because of invasive prospecting. | <ul style="list-style-type: none"> ❖ Low-Medium ❖ Medium |

| ACTIVITY | POTENTIAL IMPACT | SIGNIFICANCE (BEFORE MITIGATION) |
|--|---|--|
| <ul style="list-style-type: none"> ❖ Operational phase. ❖ Cumulative impacts. | <ul style="list-style-type: none"> ❖ Potential negative impact on the identified CBA and/or ESA areas. ❖ Potential impact on sensitive/protected flora within the footprint area. ❖ Reduced ability to meet national conservation obligations and targets should CBA/ESA be affected. ❖ Loss and fragmentation of vegetation communities within the CBA/ESA ecosystems. | <ul style="list-style-type: none"> ❖ Medium-High ❖ Medium ❖ Medium-High ❖ Medium |
| <ul style="list-style-type: none"> ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Potential negative impact on the watercourses/wetlands and FEPA's of the study area. | <ul style="list-style-type: none"> ❖ Medium-High |
| <ul style="list-style-type: none"> ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Dust nuisance because of invasive prospecting. | <ul style="list-style-type: none"> ❖ Medium |
| <ul style="list-style-type: none"> ❖ Operational phase | <ul style="list-style-type: none"> ❖ Noise nuisance because of invasive prospecting. | <ul style="list-style-type: none"> ❖ Medium |
| <ul style="list-style-type: none"> ❖ Operational phase. ❖ Cumulative impacts. | <ul style="list-style-type: none"> ❖ Potential impact on fauna within the footprint area. ❖ Fragmentation of ecosystems affecting safe movement of faunal species. | <ul style="list-style-type: none"> ❖ Low-Medium ❖ Medium |
| <ul style="list-style-type: none"> ❖ Operational phase. ❖ Decommissioning phase. | <ul style="list-style-type: none"> ❖ Infestation of the prospecting areas with invader plant species. ❖ Infestation of the reinsated areas with invader plant species. | <ul style="list-style-type: none"> ❖ Low-Medium ❖ Low-Medium |
| <ul style="list-style-type: none"> ❖ Operational phase. ❖ Decommissioning phase. | <ul style="list-style-type: none"> ❖ Potential soil contamination associated with littering and/or hydrocarbon spillages. ❖ Potential impact associated with litter/hydrocarbon spillages left at the prospected areas. | <ul style="list-style-type: none"> ❖ Medium ❖ Medium |
| <ul style="list-style-type: none"> ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Potential impact on areas/infrastructure of heritage or cultural concern. | <ul style="list-style-type: none"> ❖ Low |
| <ul style="list-style-type: none"> ❖ Operational phase. ❖ Decommissioning phase. | <ul style="list-style-type: none"> ❖ Erosion of denuded areas. ❖ Erosion of roads, veichle tracks and/or denuded areas. | <ul style="list-style-type: none"> ❖ Low-Medium ❖ Low-Medium |
| <ul style="list-style-type: none"> ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Deterioration of access roads due to prospecting activities. | <ul style="list-style-type: none"> ❖ Medium |
| <ul style="list-style-type: none"> ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Health and safety risk posed by invasive activities to prospecting employees. | <ul style="list-style-type: none"> ❖ Medium |

| ACTIVITY | POTENTIAL IMPACT | SIGNIFICANCE (BEFORE MITIGATION) |
|--------------------------|---|--|
| ❖ Operational phase. | ❖ Presence of prospector negatively affecting safety and security of the property. | ❖ Medium-High |
| ❖ Operational phase. | ❖ Increased fire risk during operational phase. | ❖ Medium |
| ❖ Decommissioning phase. | ❖ Safety risk due to uncapped boreholes and/or unrehabilitated bulk sampling pits/trenches. | ❖ Medium |

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

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

Considering the above listed impacts that may have a negative impact on the study area, the following preliminary mitigation measures are proposed to address/minimize the resulting impacts. It must be noted that the following list should be treated as initial mitigation measures that will be expanded upon should the scoping report be approved and the EIAR be drafted.

VISUAL CHARACTERISTICS

Visual Mitigation:

- ❖ Prospecting must be contained to the approved boundaries.
- ❖ The camp site and every sampling site must have a neat appearance and always be kept in good condition.
- ❖ The contractor must limit vegetation removal (where possible) and avoid the removal of large trees (>20 cm stem) or vegetation of significance without prior approval of the ECO.
- ❖ Prospecting equipment must be stored neatly in a dedicated area when not in use.
- ❖ Concurrent rehabilitation must be done as prospecting progress to limit the visual impact on the aesthetic value of the area.
- ❖ Stripping of topsoil may only be done immediately prior to the use of a specific area.
- ❖ Upon closure all sites must be rehabilitated to keep the visual impact on the aesthetic value of the area to a minimum.

GEOLOGY AND SOIL

Topsoil Management:

- ❖ The upper 300 mm of soil must be stripped and stockpiled before site camp establishment and/or prospecting.

- ❖ Topsoil is a valuable and essential resource for rehabilitation, and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- ❖ Topsoil stripping, stockpiling, and re-spreading must be done in a systematic way. The prospecting plan must be such that topsoil is stockpiled for the minimum possible time.
- ❖ The topsoil must be placed on a levelled area, within the prospecting footprint. No topsoil may be stockpiled in undisturbed areas.
- ❖ Topsoil stockpiles must be protected against losses by water- and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (grass or indigenous cover crop) on the stockpiles will help to prevent erosion.
- ❖ Topsoil heaps may not exceed 2 m to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- ❖ The temporary topsoil stockpiles must be kept free of invasive plant species.
- ❖ Storm- and runoff water must be diverted around the stockpile area to prevent erosion.
- ❖ The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site.
- ❖ The Applicant must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- ❖ A cover crop must be planted, irrigated, and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production, and any soil deficiencies must be corrected, based on a chemical analysis of the re-spread soil (if deemed necessary). It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established.
- ❖ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

HYDROLOGY

Mitigating the potential impact on watercourse/wetlands and FEPA's of the study area:

- ❖ No activities may take place, without the necessary authorisation from the DWS, within a horizontal distance of 100 m from any watercourse or estuary or within a 500 m radius from a delineated boundary of any wetland or pan.
- ❖ Should a water use authorisation be applicable to the project, the PR Holder must always adhere to the conditions thereof.

The mitigation measures associated with this impact must be expanded upon as part of the freshwater assessment and associated EIA process.

Erosion Mitigation / Storm Water Control:

- ❖ Storm water must be diverted around the topsoil heaps, prospecting areas, roads and/or tracks to prevent erosion.
- ❖ Drainage must be controlled to ensure that runoff from the prospecting areas do not culminate in off-site pollution, flooding or result in any damage to properties downstream or any storm water discharge points.
- ❖ Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system (if applicable).
- ❖ Dirty water must be collected and contained in a system separate from the clean water system.
- ❖ Dirty water must be prevented from spilling or seeping into clean water systems.

AIR AND NOISE AMBIANCE

Fugitive Dust Emission Mitigation:

- ❖ The liberation of dust into the surrounding environment must be effectively controlled using, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products).
- ❖ The site manager must ensure continuous assessment of the dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- ❖ Speed on the access road must be limited to 40 km/h to prevent the generation of excess dust.
- ❖ Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to prospecting.
- ❖ Bulk sample loads must be flattened to prevent spillage of coarse material during transportation, also minimising windblown dust.
- ❖ Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts.
- ❖ All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012).
- ❖ Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the samples from site to minimize potential dust impacts.

Noise Handling:

- ❖ The Applicant must ensure that the employees and visitors to the site conduct themselves in an acceptable manner while on site.

- ❖ No loud music may be permitted at the site camp and/or prospecting areas.
- ❖ All vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996).
- ❖ Best practice measures shall be implemented to minimize potential noise impacts.

BIODIVERSITY AND GROUNDCOVER

Mitigating the Impacts on Groundcover, CBA, and ESA areas:

- ❖ The prospecting boundaries must be clearly demarcated, and all operations must be contained to the approved areas.
- ❖ The area outside the boundaries must be declared a no-go area, and all employees must be educated accordingly.
- ❖ An invasive plant species management plan must be implemented on site to control weeds and invasive plants on denuded areas, topsoil heaps and reinstated areas.

The mitigation measures associated with this impact must be expanded upon as part of the terrestrial biodiversity assessment and associated EIA process.

Management of Invasive Plant Species:

- ❖ An invasive plant species management plan must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the prospecting activities.
- ❖ All stockpiles must be kept free of invasive plant species.
- ❖ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
 - ◆ The plants can be uprooted, felled, or cut off and can be destroyed completely.
 - ◆ The plants can be treated chemically by a registered pest control officer (PCO) using an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.

FAUNA

Protection of Fauna:

- ❖ The site manager must ensure no fauna is caught, killed, harmed, sold, or played with.
- ❖ Workers must be instructed to report any animals that may be trapped in the working area.
- ❖ No snares may be set, or nests raided for eggs or young.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

- ❖ All prospecting must be confined to the development footprint area.
- ❖ Known heritage resources must be avoided with a buffer zone of 30 m.
- ❖ Existing roads must be used as far as possible.
- ❖ The ECO for the project must assess sampling locations when these become available prior to commencement to confirm there are no graves, stone walling or any heritage features.
- ❖ If during the operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- ❖ It is the responsibility of the senior on-site manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- ❖ The senior on-site manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify SAHRA.
- ❖ Work may only continue once the go-ahead was issued by SAHRA.

LAND USE

Loss of Agricultural Land for Duration of Prospecting:

- ❖ If needed, areas that has been prospected and rehabilitated can be signed back to the landowner to revert to agricultural use once the cover crop stabilised.

EXISTING INFRASTRUCTURE

Access Road Mitigation:

- ❖ Storm water must be diverted around the access road to prevent erosion.
- ❖ Vehicular movement must be restricted to the existing access roads (where possible) and crisscrossing of tracks through undisturbed areas must be prohibited.
- ❖ Rutting and erosion of the access road caused as a direct result of the prospecting activities must be repaired by the Applicant.
- ❖ Overloading of the trucks must be prevented, and proof of load weights must be filed for auditing purposes.
- ❖ Prior to commencement, all contractors must sign an agreement confirming their responsibility towards the movement of their employees.

- ❖ Damages to fences (by prospecting employees) must be repaired/reinstated by the responsible contractor. Losses, due to gates left open by prospecting employees, must be compensated by the responsible entity.

GENERAL

Waste Management:

- ❖ Vehicle maintenance, repairs and services may only take place at the workshop and service area in the site camp. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal.
- ❖ Ablution facilities must be provided to all employees. The toilet must be placed outside the 1:100 year floodline of all watercourses.
- ❖ The ablution facilities must not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage. Any pollution problems arising from the above are to be addressed immediately by the Applicant.
- ❖ If a diesel bowser is used on site, it must always be equipped with a drip tray. Drip trays must be used during every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- ❖ Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- ❖ Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.
- ❖ Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed to the hazardous waste storage area of the workshop, either for resale or for appropriate disposal at a recognized facility. Proof must be filed.
- ❖ General waste must be contained in marked, sealable, refuse bins placed at a designated area, to be removed when filled to a registered general waste landfill site.
- ❖ No waste may be buried or burned on the site.
- ❖ It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the prospecting activities is reported to the Department of Water and Sanitation and other relevant authorities.

Management of Health and Safety Risks:

- ❖ Adequate ablution facilities and water for human consumption must daily be available on site.
- ❖ Worker(s) must have access to the correct personal protection equipment (PPE) as required by law.
- ❖ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).
- ❖ Drill-holes must daily be covered even if prospecting will continue the following day. Upon closure all boreholes must be sealed off and capped as prescribed in the rehabilitation plan.

Management of safety and security risk posed by prospecting activities to residents:

- ❖ Employees to be appointed must be vetted prior to inception of contract.
- ❖ No employees may be allowed to reside within the prospecting area.
- ❖ Prospecting employees, including truck drivers, must be educated to report suspicious looking person/s and/or matters to site management.
- ❖ Direct communication between the prospector and the landowners must be maintained for the duration of the site establishment-, operational, and decommissioning phases.

Fire Risk Management:

- ❖ No open fires are permitted on any of the sampling sites. Contained fires for heating and cooking (i.e. in a fire drum) but be restricted to designated areas at the site camp,
- ❖ Employees must be prevented from setting fires randomly outside designated areas.
- ❖ No fuel or chemicals may be stored under trees.
- ❖ Gas may not be stored in the same storage area as liquid fuel.
- ❖ Smoking may only occur at designated areas (>3 m from fuel or chemical storage areas) equipped with sand buckets for the disposal of cigarette buds.
- ❖ Ensure Work Site and the contractor's camp is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veld areas, and at least one fire extinguisher of the appropriate type irrespective of the site.
- ❖ Specific fire safety precautions must be implemented during welding activities associated with construction work. Ensure a working fire extinguisher is immediately at hand if any "HOT WORK" is undertaken e.g. welding, grinding, gas cutting etc,
- ❖ Any fires noted on site must be reported to the responsible SHE rep and/or fire officer.
- ❖ The site must implement fire emergency procedures for the duration of the site establishment-, operational-, and decommissioning phases.
- ❖ In the event of large fires all personnel must assemble at a safe assembly point to be transported from site. The fire department or local fire watch must be informed of the fire to ensure that the fire is brought under control as soon as possible.

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

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

The final site layout map can only be compiled upon receipt of the specialist study outcomes, contribution to the project by I&AP's, and the results of the non-invasive prospecting activities. Presently, the proposed prospecting area encompasses the entire 15 602 ha applied for (Regulation 2.2 Map attached as Appendix 3.2). However, the area where invasive prospecting will take place will be refined once the no-go areas are removed (based on specialist studies), areas with existing infrastructure such as farmyards are excluded, and the non-invasive prospecting identifies the areas that with potential for invasive prospecting success. A draft site layout plan will be included in the DEIAR to be commented on by the I&AP's. Subsequently, the plan will be refined and attached to the FEIAR & EMPR only to be finalised after non-invasive prospecting was approved. The final site layout plan will be submitted to the DMRE for approval prior to commencement of the invasive prospecting activities.

n) Motivation where no alternative sites were considered.

Refer to Section 2(h)(i) *Description of the process followed to reach the proposed preferred site* above, and Section 2(O) *Statement motivating the preferred site* below.

o) Statement motivating the preferred site.

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

Presently, the project proposal entails the prospecting of 15 602.0765 ha area over the properties listed earlier and presented in Figures 1 and 2. Applicants can only apply for prospecting rights within areas where such rights are not yet held by other companies/applicants. Furthermore, the prospecting activities are dependent upon the presence of the desired minerals which are again dependent upon geological formations. As the intention of the proposed prospecting operations is to determine the presence of economically viable kieselguhr deposits in the Northern Cape, an area known/expected to contain these resources was selected.

It is proposed that prospecting will be conducted using a combination of non-invasive and invasive activities. The invasive prospecting will include drilling and trenching that will entail the collection of large samples ($\pm 50\,000\text{ m}^3$ per phase) that constitutes bulk sampling. The only other alternative would be to prospect the area without bulk sampling. However, the Applicant entered a partnership with an international firm regarding the testing of the kieselguhr samples for metallurgical and production compatibility with their production plants. The company requires bulk samples to facilitate the metallurgical and production compatibility testing. Also, kieselguhr has varying qualities and thus the samples must be distributed to a wide range of prospective clients that requires the collection of large samples.

The Applicant indicated that sensitive areas and areas of conservation importance will be avoided by the proposed activities. The preferred drilling, trenching and pitting locations will be determined following the outcome of phases 1 & 2 and the mapping of geological survey data. The EIAR will include a list of areas (identified by specialists) that must be avoided and where no prospecting may be allowed.

The Applicant proposes to use air drills for RAB (rotary air blast) drilling and reverse circulation drilling and diamond drill rigs will be used for core drilling. Geophysical equipment will be needed for ground electro-magnetic, magnetic and gravity surveys. The bulk sampling trenches/pits will be dug by excavator, upon which the loosened material will be moved by FEL to the crushing/milling plant. The material will be crushed, screened, and sized to stockpiles from where it will be transported off-site by trucks. Although sample collection will require various mechanical equipment to be on site, the process do not require highly specialised technology as secondary processing and metallurgical testing will occur off-site. Therefore no technology alternatives were deemed viable for this project.

The operational aspects of the activity will be based on the non-invasive prospecting results. The project allows some flexibility in terms of when, where, and how the sampling and surveying is conducted.

3. PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

Refer to Section 2(h)(i) *Description of the process followed to reach the proposed preferred site*, and Section 2(O) *Statement motivating the preferred site above*.

b) Description of the aspects to be assessed as part of the environmental impact assessment process.

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

The aspects to be assessed as part of the environmental impact assessment process that will follow upon approval of the Scoping Report by the DMRE will include, but not be limited to, the following:

1. The need and desirability of the proposed activity will be discussed in detail and weighed against the no-go option of upholding the *status quo* at the study area.
2. The inputs received during the public participation process (first- and second phase) will be assessed and considered by the project team during the EIA process.

3. The findings, recommendations and management measure proposed in the Freshwater Assessment, and the Heritage Impact Assessment (inclusive of Palaeontological opinion) will be assessed during the EIA process and incorporated into the DEIAR.
4. The impact of the proposed project on the physical-, biological-, and human environments will be assessed. The nature, probability and significance of the potential impacts associated with the project will be determined using the above mentioned methodology.
5. Mitigation measures will be proposed to control, modify, remedy, or stop the impacts associated with the proposed activity on the surrounding environment.
6. Any additional requirements submitted by the DMRE will be incorporated into the DEIAR and treated accordingly.

c) Description of aspects to be assessed by specialists.

The following specialist studies will be conducted as part of the EIA process:

Freshwater (Wetland and Aquatic) Habitat Desktop Sensitivity:

- ❖ Conducting a verification field trip obtaining insight into the characteristics, extent, and surroundings.
- ❖ GIS desktop mapping of watercourses (wetlands and rivers) within the targeted prospecting rights boundary.
- ❖ Classification of wetlands and rivers/streams at a desktop level using the National Wetland Classification Guidelines (Ollis et al., 2013) and grouping of wetlands and rivers/streams into 'Process Units'.
- ❖ Review of freshwater ecosystem context as well as the ecological and conservation setting in the prospecting rights area, based on available literature, existing databases (e.g., SANBI, NFEPA and other provincial databases).
- ❖ Determine high sensitivity / no-go areas based on the available desktop information.
- ❖ Provision of a desktop freshwater assessment (wetland and aquatic) report accompanied by a delineation and sensitivity map for the project to guide prospecting location planning.
- ❖ Recommendations and adjustments for prospecting site locations.

Terrestrial Vegetation/Habitat Desktop Sensitivity:

- ❖ Conducting a verification field trip obtaining insight into the characteristics, extent, and surroundings.

- ❖ Desktop assessment of the floral and faunal species of conservation concern that may occur within the development footprint based on available species records for the region (e.g., POSA database, SABAP2, Red Data Lists, etc.).
- ❖ Review of any documented and available studies/information for the development site and surrounding areas.
- ❖ Contextualization of the study area in terms of important biophysical characteristics and conservation planning using available spatial datasets and conservation plans Desktop mapping of all 'untransformed' terrestrial vegetation and habitat within the prospecting boundaries.
- ❖ Determine high sensitivity / no-go areas based on the available desktop information.
- ❖ Provision of a Desktop Terrestrial Biodiversity report accompanied by a sensitivity map for the project to guide prospecting sites for prospect planning.

Desktop Heritage Impact Assessment (Including Palaeontological Input):

- ❖ The goal of the study will be the compilation of a desktop based Heritage Impact Assessment Report (HIA) inclusive of a palaeontological opinion.
- ❖ The HIA will describe all archaeological and historical artefacts, structures and settlements thus far documented in the area.
- ❖ Establish the level of sensitivity/importance of the archaeological, palaeontological, and historical remains in the area based on the outcome of the desktop study.
- ❖ Proposed practical mitigation measures for potential impacts.
- ❖ Indicate limitations and assumptions.
- ❖ Propose recommendations on the way forward.

d) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

The impact assessment component of the EIA is subdivided into several environmental aspects to be studied as listed below (preliminary list):

- ❖ Topography;
- ❖ Visual Characteristics;
- ❖ Geology and Soils;
- ❖ Hydrology;
- ❖ Air Quality and Noise Ambiance;
- ❖ Biodiversity and Groundcover;
- ❖ Fauna;
- ❖ Cultural and Heritage Environment;
- ❖ Socio-economic Environment / Land Use;

- ❖ Existing Infrastructure; and
- ❖ Alternatives (if applicable) including the No-go Option.

Greenmined will use in-house specialists to review the environmental aspects which will be assessed as part of the environmental impact assessment process. The environmental aspects briefly described in the Scoping Report will be updated, and site and technology specific impacts and mitigation recommendations will be made and be reviewed by the project team, registered stakeholders and I&AP's, and competent authority (DMRE).

The significance of the impacts will be assessed in terms of the methodology described in *Section 2 j) Methodology Used in Determining and Ranking the Significance*.

e) The proposed method of assessing duration significance.

The significance of the identified impacts will be determined using the approach outlined in *Section 2 j) Methodology Used in Determining and Ranking the Significance*. The environmental significance assessment methodology is based on the Overall Consequence x Overall Likelihood.

Consequence analysis is a mixture of quantitative and qualitative information, and the outcome can be positive or negative. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: Severity/Intensity, Duration and Extent/Spatial Scale.

The determination of likelihood is a combination of Frequency and Probability.

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of LOW, LOW-MEDIUM, MEDIUM, MEDIUM-HIGH or HIGH.

Qualitative description or magnitude of Environmental Significance is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritizations and decision making process associated with this event, aspect, or impact.

Assessing duration significance forms part of the environmental significance determination of the impacts and will be assessed accordingly.

f) The stages at which the competent authority will be consulted.

The environmental authorization- and prospecting right application in terms of the NEMA: EIA Regulations, 2014 (as amended) and the MPRDA, 2002 respectively were submitted to the DMRE on 12 October 2023 and accepted on 13 December 2023. The DMRE granted additional reporting days on the Scoping Report resulting in the final report being due on 29 March 2024.

As competent authority the DMRE will be invited to comment on the Draft Scoping Report (DSR), and any comments received will be incorporated into the FSR to be considered for approval.

Should the DMRE approve the Final Scoping Report, the draft EIA report, including all investigations, assessments, and the specialist studies, will be circulated for a 30-day commenting period. Any additional requirements received from the DMRE will be added to the Final EIA report to be submitted for approval.

As stipulated in the NEMA EIA Regulations, 2014 (as amended) read with the MPRDA, 2002, the EIA process will comprise of the following:

1. Application for Environmental Authorization and a Prospecting Right uploaded with accompanying documentation to the online SAMRAD system;
2. The DMRE accepts the application;
3. Draft Scoping Report circulated for perusal by I&AP's and stakeholders (including the DMRE);
4. Final Scoping Report (FSR) submitted to the DMRE;
5. The DMRE decision on FSR;
6. If the FSR is approved, the Draft EIA report is circulated for perusal by I&AP's and stakeholders (including the DMRE);
7. Final EIA report submitted to DMRE;
8. DMRE decision on Final EIA report;
9. If the FEIAR is approved, the DMRE will request the submission of the Financial Provision amount;
10. Once this financial provision amount was lodged with the DMRE, the Environmental Authorization will be issued;
11. Appeal period;
12. Approval of supporting documentation including, but not limited to, the Prospecting Works Programme; and
13. Execution of the Prospecting Right.

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

i) Steps to be taken to notify interested and affected parties.

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein).

The aspects to be assessed as part of the environmental impact assessment process were added to the Draft Scoping Report that will be distributed to all registered I&AP's and stakeholders for a 30-day commenting period.

All I&AP's and stakeholders will be informed of the availability of the Draft Scoping Report for their perusal, should they be interested. An electronic copy of the document will be available on the Greenmined website.

Any comments and recommendations received on the Draft Scoping Report will be added to the Final Scoping Report to be submitted to the DMRE for approval.

ii) Details of the engagement process to be followed

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage).

Public participation during the impact assessment phase of the EIA will entail a review of the findings of the EIA, presented in the Draft Scoping Report and Draft EIA and EMPr Reports. These reports will be made available for public comment as described above.

I&APs will be advised of the availability of these reports and how to obtain it. They will be encouraged to comment in writing (mail or email). Any issues, comments or suggestions raised during the comment period will be added to the Comments and Response Report (CRR) that will accompany the Final Scoping Report.

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

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.)

Upon approval of the Final Scoping Report, the Draft EIA report will be compiled. The Draft EIA & EMPr report will be circulated to the registered I&AP's and stakeholders for their perusal over a 30-days period.

The Environmental Impact Assessment Report and Environmental Management Programme Report templates prescribed by the DMRE in terms of the National Environmental Management Act, 1998 in respect of listed activities that have been triggered by this application will be used to assess the information regarding the proposed project.

The research and analysis regarding the project will be processed and interpreted to compile the information required in the abovementioned template to be distributed for public comment.

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

The EIA process for the proposed project is depicted below:

1. Application for Environmental Authorization and Prospecting Right to the DMRE;
2. The DMRE accepts the application;

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3. Draft Scoping Report circulated for perusal by I&AP's and stakeholders;
4. Final Scoping Report (FSR) submitted to DMRE;
5. DMRE takes a decision on the FSR;
6. Impact Assessment Process:
 - ❖ Project description and site environmental baseline;
 - ❖ Impact assessment;
 - ❖ Mitigation measures and recommendations;
 - ❖ EMPr compilation;
7. Draft EIA report circulated for perusal by registered I&AP's and stakeholders;
8. Final EIA report submitted to DMRE;
9. DMRE takes a decision on the Final EIA report;
10. Submission of Financial Provision amount;
11. Announcement of Environmental Authorization and Appeal Procedure;
12. Opportunity to Appeal;
13. Execution of the Prospecting Right.

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

Table 21: Table listing the identified impacts, residual risks to be managed and monitored.

| ACTIVITY | POTENTIAL IMPACT | MITIGATION TYPE | POTENTIAL FOR RESIDUAL RISK |
|--|---|--|-----------------------------|
| <p>Whether listed or not listed</p> <p>(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply, dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc)</p> | <p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)</p> | <p>(modify, remedy, control or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.</p> | |
| <ul style="list-style-type: none"> ❖ Site establishment. ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Temporary loss of agricultural land earmarked for site camp establishment. ❖ Temporary loss of some agricultural land earmarked for invasive prospecting. | <p>Should the proposed project be approved, the operation will temporarily obstruct some agricultural land, only to be reversed upon the decommissioning phase. The impact could be controlled through progressive rehabilitation.</p> | <p>LOW</p> |
| <ul style="list-style-type: none"> ❖ Site establishment. ❖ Operational phase. | <ul style="list-style-type: none"> ❖ Visual intrusion because of site camp. ❖ Visual intrusion because of invasive prospecting. | <p><u>Control:</u> Proper housekeeping and implementation of progressive rehabilitation.</p> | <p>MEDIUM</p> |
| <ul style="list-style-type: none"> ❖ Operational phase. ❖ Cumulative impacts. | <ul style="list-style-type: none"> ❖ Potential negative impact on the identified CBA and/or ESA areas. ❖ Potential impact on sensitive/protected flora within the footprint area. ❖ Reduced ability to meet national conservation obligations and targets should CBA/ESA be affected. ❖ Loss and fragmentation of vegetation communities within the CBA/ESA ecosystems. | <p><u>Control & Modify:</u> Consideration of specialist findings and recommendations, and demarcation and management of no-go areas.</p> | <p>LOW</p> |

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| ACTIVITY | POTENTIAL IMPACT | MITIGATION TYPE | POTENTIAL FOR RESIDUAL RISK |
|--|--|---|-----------------------------|
| ❖ Operational phase. | ❖ Potential negative impact on the watercourses/wetlands and FEPA's of the study area. | <u>Control & Modify:</u> Consideration of specialist findings and recommendations, and demarcation and management of no-go areas. | LOW |
| ❖ Operational phase. | ❖ Dust nuisance because of invasive prospecting. | <u>Control:</u> Dust suppression methods and proper housekeeping. | LOW |
| ❖ Operational phase. | ❖ Noise nuisance because of invasive prospecting. | <u>Control:</u> Noise suppression methods and proper housekeeping. | LOW |
| ❖ Operational phase. ❖ Cumulative impacts. | ❖ Potential impact on fauna within the footprint area. ❖ Fragmentation of ecosystems affecting safe movement of faunal species. | <u>Control & Stop:</u> Implementing good management practices. | LOW |
| ❖ Operational phase. ❖ Decommissioning phase. | ❖ Infestation of the prospecting areas with invader plant species. ❖ Infestation of the reinstated areas with invader plant species. | <u>Control:</u> Implementing soil- and invader plant control/management. | LOW |
| ❖ Operational phase. ❖ Decommissioning phase. | ❖ Potential soil contamination associated with littering and/or hydrocarbon spillages. ❖ Potential impact associated with littering/hydrocarbon spillages left at the prospected areas. | <u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan. | LOW |

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| ACTIVITY | POTENTIAL IMPACT | MITIGATION TYPE | POTENTIAL FOR RESIDUAL RISK |
|--|---|---|-----------------------------|
| ❖ Operational phase. | ❖ Potential impact on areas/infrastructure of heritage or cultural concern. | <u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol. | LOW |
| ❖ Operational phase. ❖ Decommissioning phase. | ❖ Erosion of denuded areas. ❖ Erosion of roads, vehicle tracks and/or denuded areas. | <u>Control & Remedy:</u> Proper housekeeping and storm water management. | LOW |
| ❖ Operational phase. | ❖ Deterioration of access roads due to prospecting activities. | <u>Control & Remedy:</u> Maintaining the access roads for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to prospecting. | LOW |
| ❖ Operational phase. | ❖ Health and safety risk posed by invasive activities to prospecting employees. | <u>Control & Remedy:</u> Site management and proper housekeeping. | LOW |
| ❖ Operational phase. | ❖ Presence of prospector negatively affecting safety and security of the property. | <u>Control & Remedy:</u> Site management and proper housekeeping. | LOW |
| ❖ Operational phase. | ❖ Increased fire risk during operational phase. | <u>Control & Remedy:</u> Site management and proper housekeeping. | LOW |
| ❖ Decommissioning phase. | ❖ Safety risk due to uncapped boreholes and/or unrehabilitated bulk sampling pits/trenches. | <u>Control:</u> Implentation of concurrent rehabilitation. | LOW |

j) Other Information required by the competent Authority

- i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24(3)(a) and (7) of the National Environmental Management Act (Act 107 of 1998) the EIA report must include the:**

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

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

The following preliminary potential impacts were identified that may have an impact on the socio-economic conditions of directly affected persons:

❖ Visual intrusion associated with the invasive prospecting activities:

The removal of the vegetation cover to sample the identified sites will impact on the visual character of the study area. The significance of this impact must be fully assessed during the EIA process taking possible layout alternatives into consideration to reduce the impact as much as possible.

❖ Impact on the air quality and noise ambiance of the study area:

The operation of prospecting equipment potentially increases the possibility of dust and noise related impacts on the receiving environment. The degree of impact as well as the significance of dust and noise generation must be assessed during the EIA process. By nature, these impacts require constant monitoring to be implemented throughout the operational-, and decommissioning phases of the project.

❖ Potential impact on safety and security of properties:

As mentioned earlier the increased concentration of people, because of the proposed project, may negatively affect the safety of the properties. Although this is a highly speculative matter, it is widely accepted that crime follows areas of higher concentration and opportunity. The Applicant must acknowledge the possibility and commit to taking part in local security forums and neighbourhood watches to alleviate the significance of the impact.

❖ Employment opportunities and socio-economic impact:

The proposed labour component of the activity will be 15 - 20 employees. The operation will contribute to the local economy in the area, both directly and through the multiplier effect that its continued presence will create. Equipment and supplies will be purchased locally, and wages are spent at local businesses, generating both jobs and income in the area. Although the employees will not reside on site, they will be from the surrounding community.

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

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

The presence of national estate as referred to in section 3(2) of the NHRA, 1999 will be assessed by the archaeologist and palaeontologist during the EIA process. The Applicant indicated that should such areas of importance be identified the recommendations of the specialists will be heeded with changes being made to the design and or layout of the proposed project footprint.

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

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

The alternatives to be considered during the impact assessment process will be done at the hand of information obtained during the site investigation, public participation process, desktop studies as well as the specialist studies conducted of the earmarked area. As discussed earlier the following alternatives may need to be assessed in the EIAR:

e) Operational aspects of the activity

The operational aspects of the activity will be based on the non-invasive prospecting results. The project allows some flexibility in terms of when, where, and how the sampling and surveying is conducted. For instance, the site camp location and jeep-track routes will be determined in accordance with the landowner agreement and identified sensitive areas that must be avoided. The project can also consider mitigating impacts such as dust generation, prospecting during agriculturally important seasons etc. The DEIAR will expand on the operational aspects of the project upon receipt of the specialist studies.

f) Option of not implementing the activity (No-go Alternative)

Amongst others, the impact of prospecting on current, and future land uses of the study area will be compared to the *status quo* and will be considered as part of the EIA process and discussed in the DEIAR.

I) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

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

A handwritten signature in cursive script, appearing to read 'Fouche'.

Signature of the EAP
DATE: 21 February 2024

m) UNDERTAKING REGARDING LEVEL OF AGREEMENT

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

A handwritten signature in cursive script, appearing to read 'Fouche'.

Signature of the EAP
DATE: 21 February 2024

- END -