



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT BASIC ASSESSMENT REPORT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (AS AMENDED IN 2021) 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).

TULA COAL GROUP (PTY) LTD

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/12712PR

24 October 2021

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PART A
SCOPE OF ASSSMENT AND BASIC ASSESSMENT REPORT

1 APPLICANT AND EAP DETAILS

1.1 Details of Applicant

Applicant	Tula Coal Group (Pty) Ltd
File Reference Number SAMRAD	NC 30/5/1/1/2/12712PR
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1.2 Details of the EAP

Environmental Assessment Practitioner	Jomela Consulting (Pty) Ltd
Contact Person (s)	Nhlanhla Khosa
Telephone	071 589 6813
Fax Number	086 626 4839
Email:	nhlahlakhosa@jomela.co.za
EAP Qualifications	<p><u>Yvonne Gutoona</u></p> <p>B.Sc. Geology and Geography (UZ)</p> <p>Membership of Professional Associations:</p> <p>Registered as a Natural Scientist (Cert.Sci.Nat.), with the South African Council for Natural Scientific Professions (SACNASP)</p> <p>Member of the Geological Society of South Africa</p>

1.3 Expertise of the EAP

The EAP's combined have over twenty years' experience. Summary of Environmental aspects below:

- Environmental Impact Assessments
- Basic assessments, WULA reports
- Water use license application
- Waste use license application

- Soil Assessment, Specialist Studies
- Prospecting and Mining Right Authorizations
- Environmental Management Plans
- Public Participation
- Environmental Authorizations

See Attached Appendix for EAP experience.

2 PROJECT INFORMATION

2.1 Location of the overall Activity.

Farm Name:	Santoy 230: Remainer and Portion 1, Belgravia 264: Remainer and Portion 1 and Nchwaning 267: Portion 2 & 3: Gloria 255, Portion 1
Application area (Ha)	The area covers 4275 hectares
Magisterial district:	Located in the John Taolo Gaetsewe Municipality, Northern Cape
Distance and direction from nearest town	The farm is located 3km to 12km North of the town Hotazel
21-digit Surveyor General Code for each farm portion	C041000000002300000; C041000000002300010, C0410000000026500020, C0410000000026500030, C0410000000026400000, C0410000000026400010, C0410000000025500010

2.2 Locality map

(Show nearest town, scale not smaller than 1:250000).

The proposed prospecting will be on the Santoy 230: Remainer and Portion 1, Belgravia 264: Remainer and Portion 1 and Nchwaning 267: Portion 2 & 3: Gloria 255, Portion 1, located in the John Taolo Gaetsewe Municipality Northern Cape trending from 3km to 12km North of the town Hotazel.

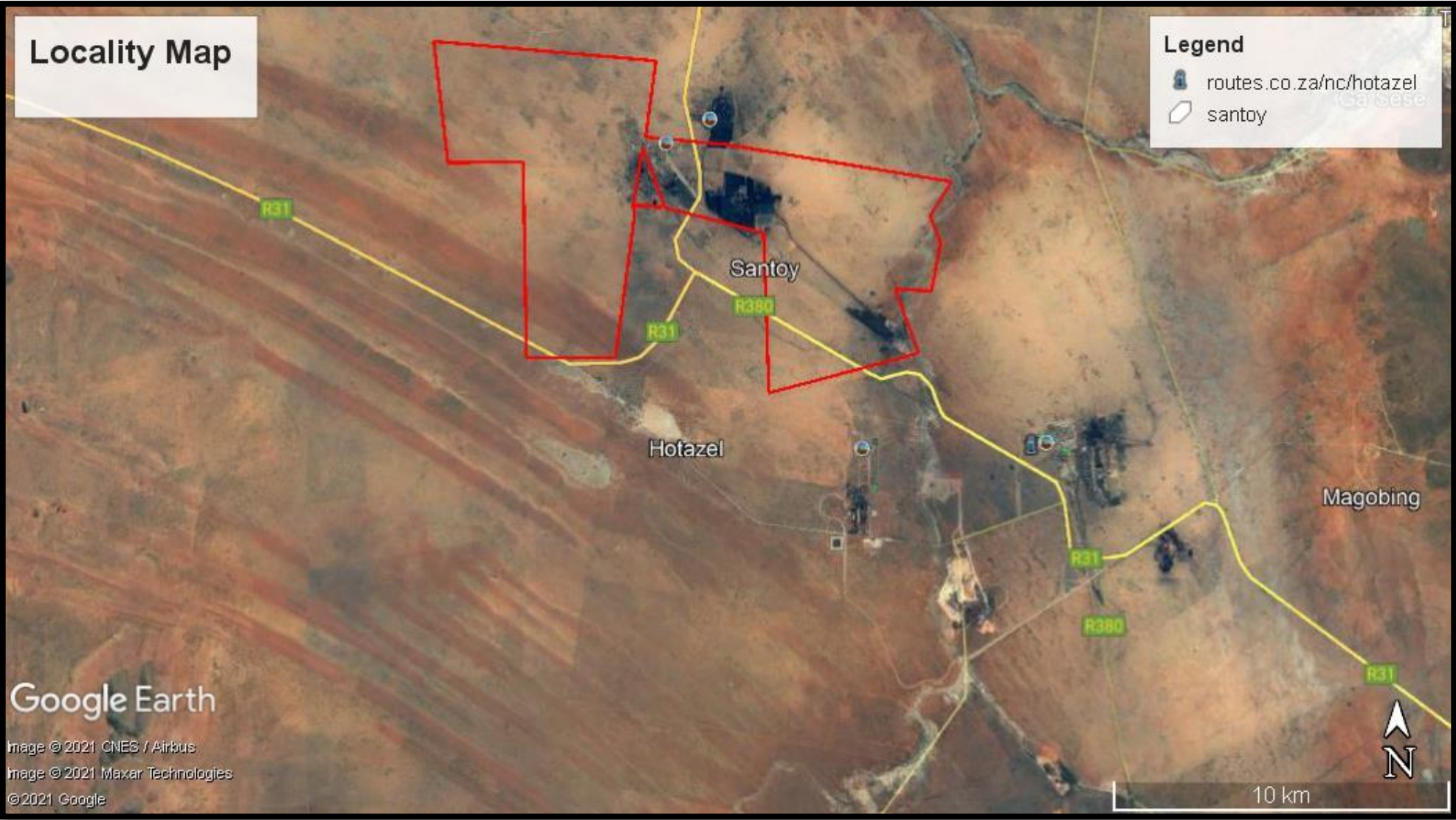


Figure 1: Locality Map

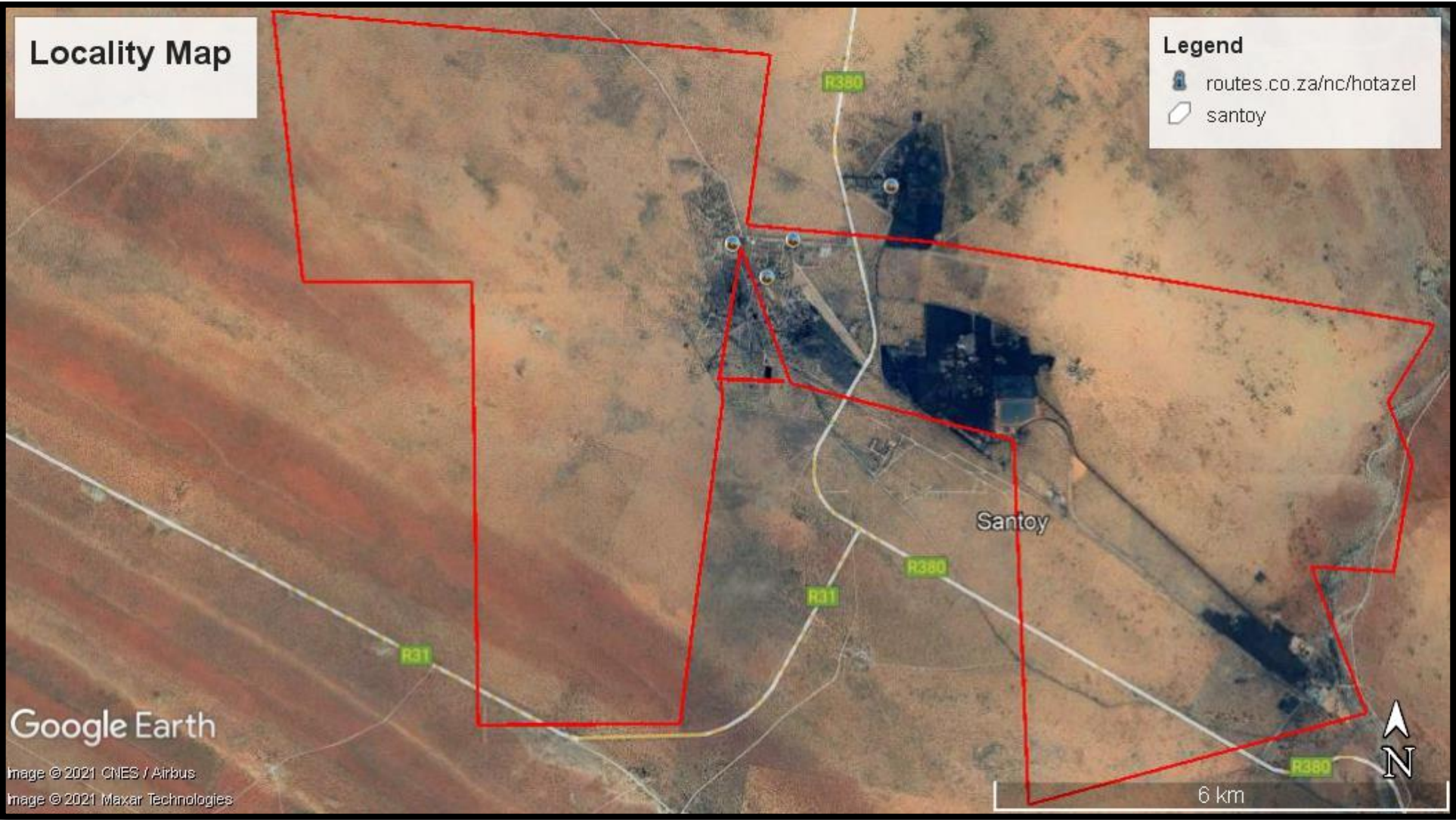


Figure 2: Google Site Map

2.3 Description of the scope of the proposed overall activity.

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

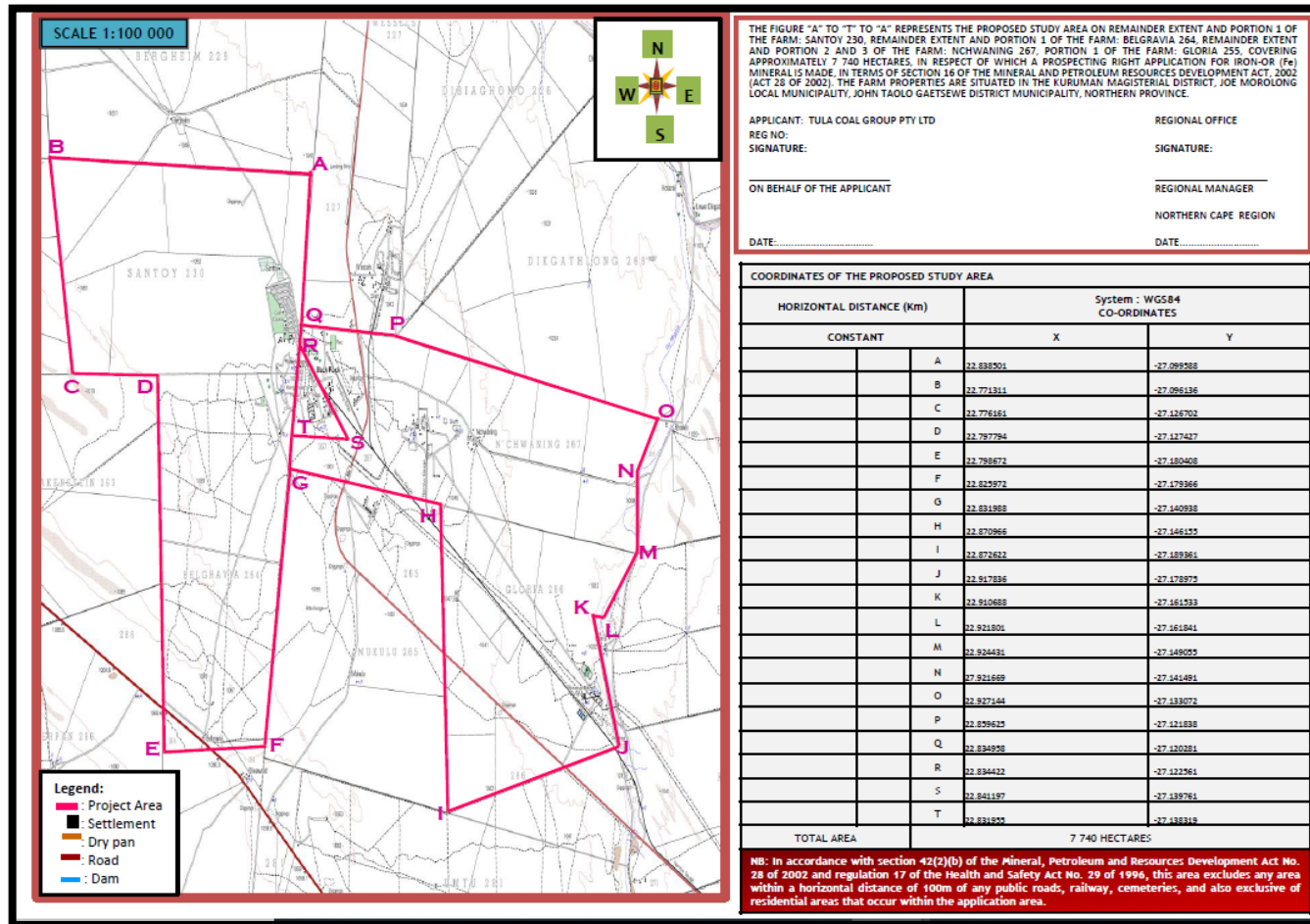


Figure 3: Regulation 2.2 Map of the Prospecting Right Application Area

2.3.1 Description of overall Activity

Field Mapping- This method includes the identification of exposed geological structures and lithological outcrops, through aerial photo interpretation, satellite image interpretation and by walking the farms/folios.

F.1 Drilling

A proposed drilling programme of 20 boreholes will be used to further define the ore body. The drilling program will determine the exact outline, shape and size of the ore body. The core drilling is generally done in this target. The different rock sample intersecting the deposit will be sent for assay at one of the accredited laboratories.

RC-drilling- Drilling is done in phases, as outlined elsewhere, over anomalous target areas, using reconnaissance lines or a grid of 100m or 400m x 400m holes will be approximately >50m deep depending on the local depth. The drill holes will be sent to the laboratory for assay.

F.2 Geophysical Survey

Ground gravity surveys are applied in order to outline ore deposit positions and size accurately. Ground gravity surveys are carried out on a grid layout. The grid is placed in the field through the use of total station or real time GPS system. Gravity readings and accurate elevations are recorded at each station on the grid. The grid that is used is a 200m x 200m and if there are anomalies in the data the grid is tightened to 100m x 100m. The smaller grid increases the resolution and smaller features then become visible. 1000 gravity points will be needed to delineate the ore bearing lithologies. The gravity data will be evaluated by means of RC Diamond drilling. Geophysical Survey- Ground geophysical surveys will be conducted over selected target areas on a 200m x 200m grid. Ground gravity surveys is used to outline the ore hosting lithology.

A phased prospecting programme will be applied:

Phase 1- Desktop Studies

It will comprise of gathering geological information about the project area. This will also include visiting organizations like the council of geosciences in order to research on what has been done in the region. This will take about the whole month to complete.

Phase 2- Field Mapping

It mainly consist of a comprehensive field mapping, geologist will complete properly selected transverse while recording their geological observations.

Geophysical Survey

Mainly consist of a comprehensive ground gravity survey to delineate magnetic anomalies and potential target areas.

Preliminary Drilling and assaying

It consists of reconnaissance drilling of +- 5 Boreholes. The proposed drilling program in its entirety consists of 20 holes.

Detailed drilling and assaying

It consists of the remainder of the 20 boreholes minus the preliminary boreholes for detailed drilling within the determined target areas, to delineate the ore body accurately, and to determine depth to bedrock and internal stratigraphic composition of the ore body.

Geological Modelling

This will be comprised by detailed geological modeling.

2.3.1.1 DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES:

(These activities do not disturb the land where prospecting will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc)

a) Desktop Study

It is more of a literature review and research on all the completed work on the area, it also include accruing results from the companies that has already worked on the area.

b) Field Mapping

This involves the geologist walking the area and making observations which are then recorded on a map.

c) Geophysical surveys

The gravity method measures the gravitational attraction exerted by the earth at a measurement station on the surface. The strength of the gravitational field is directly proportional to the mass and therefore, the density of subsurface materials. Anomalies in the earth's gravitational field result from lateral and depth variations in the density of subsurface materials.

Gravitational acceleration is measured in MilliGals or sometimes in microGal for very high resolution surveys. Gravity acceleration variations as a result of geological changes is very small compared to the average gravity acceleration measured and require the need for very precise measuring and field techniques.

Gravity works well in environments where there is a dramatic density contrast between the host and the target mediums.

2.3.1.2 DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:

(These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc)

a) Drilling

This will involve both Reverse circulation and core drilling, the drilling equipment mounted on heavy truck will be use. All means will be done to reduce the environmental damages.

Purpose of the drilling activity will be to collect samples to be tested at the laboratory.

2.3.1.3 DESCRIPTION OF PRE-/FEASIBILITY STUDIES

(Activities in this section includes but are not limited to: initial, geological modeling, resource determination, possible future funding models, etc)

Geological modeling and resource evaluation will be done using the computer software Supac version 6. This will result in the compilation of the competent person report.

Table 1: Timeframes for prospecting activities

Phase	Activity <small>(what are the activities planned to achieve optimal prospecting)</small>	Skill(s) required <small>(refers to the competent personnel that will be employed to achieve the required results)</small>	Timeframe <small>(in months) for the activity)</small>	Outcome <small>(What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)</small>	Timeframe for outcome <small>(deadline for the expected outcome to be delivered)</small>	What technical expert will sign off on the outcome? <small>(e.g. geologist, mining engineer, surveyor, economist, etc)</small>
1	None invasive Desktop study	Geologist	0-6month	Desktop study report	6month	Geologist
2	None Invasive Field mapping	Geologist	5-8 month	Geological Maps	Month 14	Geologist
3	None Invasive Geophysical survey	Geologist	8-10 Month	Anomaly Maps	Month 24	Geophysicist
4	Invasive prospecting Preliminary Drilling and Assaying	Drillers Geologist	12 -14 Month	Preliminary resource model	Month 38	Geologist, Surveyors
5	Invasive prospecting Detailed Drilling and assaying	Drillers Geologist	12 Moth	Resource Model	Month 50	Resource geologist
6.	Geological modeling and evaluation	Geologist	10	CPR	Moth 60	Resource Geologist

2.4 Listed and specified activities

Table 2: Listed Activities

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 324, 325, 327)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
Any activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	Extent of application area: 4275 hectares	X	GNR 327 – Listing 1: Activity No. 20	N/A

3 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

The following section presents a detailed description of all the activities associated with the proposed Prospecting Application.

❖ Access Roads

Access to the site will be required during mapping, drilling and sampling activities. A number of existing roads and tracks already traverse the proposed prospecting site and where practicable, these roads will be used.

During mapping activities, vehicle access will be gained to site through the veld and the establishment of a track to gain repeated access to a mapping site will not be required.

Once drilling activities are underway, temporary access roads may be established for repeated access to the drill site if the identified drill site cannot be access via existing roads and tracks.

❖ Water Supply

It is anticipated that water brought onto the site, will be sourced from Hotazel. Water will be trucked from these sources to the identified drill sites, water bowsers will be deployed to these sites as and when required.

Continuous water supply will be required during drilling, and On-site water storage tanks with a capacity of 15,000 for water supply to the drill, will be installed. Additional water requirements relate to the potable water supply for employees and workers. A temporary 260litre on-site vertical water storage tank for drinking water and generalise by persons will be provided at the drill site.

❖ Ablution

Ablution facilities at the drill site will involve the installation of drum or tank type portable toilets.

❖ Temporary Office Area

A temporary site office shaded area will be erected at the drill sites. No on-site electricity generation using generators will be undertaken as the drilling will come fully equipped. Meals will be provided to the staff and workers as no heating and/or cold storage facilities will be available. A shaded eating area will be provided.

❖ Accommodation

No accommodation for staff and workers will be provided on- site and all persons will be accommodated in nearby towns. Workers will be transported to and from the prospecting site daily. Night security staff will be employed once equipment has been established onsite.

❖ Blasting

As the Prospecting Works Programme does not allow for bulk sampling, **NO** blasting will take place.

❖ Storage of Dangerous Goods

During the drilling activities limited quantities of diesel fuel, oil and lubricants hence no hydrocarbons will be stored on site.

3.1 Policy and Legislative Context

Table 3: Legislation / Policy / Guideline

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	The project requires a prospecting right authorisation from the Department of Mineral Resources	A prospecting right was lodged with the DMR and the acceptance letter was received on the 30 of August 2021
NEMA Environmental Impact Assessment (EIA) Regulations, 2017	This Basic Assessment and Environmental Management Plan To be conducted. Baseline environmental information of the project area will be assessed. Mitigation measures and recommendations where provided according to best practice standards.	An Application for Environmental Authorisation was submitted to the DMR when the application was lodged. The DMR Requested the submission of the Basic Assessment Report and EMP within 90 days of the letter.
The South African Constitution The South African Constitution (Act 108 of 1996) constitutes the supreme law of the country and guarantee the rights of all people in South Africa	Applied at potential impacts identification as well as mitigation measures and public participation	A public participation process will be followed, and consultations will be done regarding the proposed project. An EMP and awareness plan will be designed according to the issues raised during this process
National Environmental Management: Biodiversity Act, 2004	Presence of indigenous trees or extinct species	The EMP will regulate the applicant to apply for Tree Removal Permit from the Relevant authority prior to the potential removal of any sensitive and/or protected species.
National Environmental Management: Waste Act	Provisions of the waste act were consulted to determine whether a waste license was required for any aspect of the proposed development.	The project activities do not trigger a waste management license, but proper waste management measures will be addressed in the EMP.

Section 38 of the National Heritage Resources Act (Act No. 25 of 1999)	Legislation consulted during the impact assessment process, to determine what legal requirements with regards to the management of national heritage resources were relevant to this application.	The Northern Cape heritage association has been notified of the project. An upload of the BAR will be done on the SAHRIS online system for comment
National Environmental Biodiversity Act The National Environmental Management Biodiversity Act (NEM:BA), 2004 (Act No.10 of 2004), provides for: (i) the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; (ii) the protection of species and ecosystems that warrant national protection; (iii) the sustainable use of indigenous biological resources; (iv) the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; (v) the establishment and functions of a South African National Biodiversity Institute;	Baseline review of the biodiversity.	SANBI database will be used to determine conservancy status as well as mitigation measures for alien invasive species encroaching the project area.
National Water Act The NWA (Act No. 36 of 1998)	The proposed activities do not require a water use license	The department has been notified of the proposed project and comments will be addressed.
National Environmental Management: Air Quality Act, 2004 (Act no.39 of 2004);	Dust monitoring on site during the operation	As part of the EMP dust suppression methods will be used.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996);	Health and Safety Policy	Risk Impact Assessment to be conducted
Land Use Planning & Management Guidelines	Used in the BAR to identify Ned and Desirability	Guideline considered during the assessment of the need and desirability of the proposed development, at the provincial scale.
John Taolo Gaetsewe District Municipality (DC45) Integrated Development Plan	Source of background demographic and socio-economic information	Utilized as a source of demographic and socio-economic information for the area.
2016 Northern Cape Critical Biodiversity Areas	The Northern Cape CBA Map identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs),	Sensitive area and conservation of vulnerable and threatened biodiversity areas

3.2 Need and desirability of the proposed activities.

South African economy heavily relies on the mining sector. Successful prospecting for the manganese will boost the local economy as the project will advance to mining phase creating employment, additions to the social and labour plan as well as HDSA. The mining sector has provided more employment opportunities for the citizens in general. The Project is in line with the with the current mining activities occurring in the area. The proposed project should be considered considering the current land use with minimal impact or disturbance to these activities and concurrent rehabilitation of the drilled areas will be undertaken.

3.3 Motivation for the overall preferred site, activities and technology alternative.

3.3.1 Regional Geology

The area is located within the following geological layers:

Hartebeest Pan Granite Grey: fine- to medium-grained, well foliated granite, grading into augen gneiss in places. Yellow-Alluvium, sand and calcrete, Nouzes: Olivine gabbro and gabbro, Stalhoek: Leucocratic biotite gneiss, quartz-feldspar gneiss. HOM: Leucocratic (light grey) biotite gneiss with intercalations of calc-silicate rocks, mafic gneiss, and a quartzite-schist association. Dwyka- Diamictonite (polymictic clasts, set in a poorly sorted, fine- grained matrix) with varved shale, mudstone with dropstones and fluvio-glacial gravel common in the north.

The iron ore bodies in the north-western part of the Kalahari manganese field (Wessels, Black Rock and N'Chwaning Mines) have been termed **Wessels-type ore**. These ore bodies contrast markedly to the primary Mamatwan-type ore. The ore has been hydrothermally altered and metamorphized. This resulted in a iron ore with a coarser grain size with higher manganese content. This ore is braunite-rich and contains other major minerals such as braunite II, bixbyite, hausmannite, marokite and hematite together with minor amounts of calcite. The overall carbonate content of the Wessels-type ore is lower than that of the Mamatwan-type ore. Andradite and barite are common gangue minerals. Additionally, minor minerals such as tephroite and rhodochrosite as well as aegirine (in the iron formation above the ore layers) are associated with this ore type.

Most of the Wessels, Black Rock, N'Chwaning II and parts of N'Chwaning I ores are of this type.

The Hotazel outlier is situated in a graben to the east of Black Rock and contains a very high-grade ore (60 to 70 per cent average). Hausmannite with lesser amounts of other minerals and a very low carbonate component are the main constituents of the Hotazel super grade ores. Although the ore is found typically in the Hotazel Mine, parts of the Langdon Annex and N'Chwaning I Mines also contain this ore-type.

Mines of the Kalahari Manganese Fields

The first mine to open is the iconic Black Rock mine, in 1940, with underground operations beginning in 1942. This was followed in quick succession by Devon in 1954 and Smartt in 1959, by Assmang and Samancor respectively. The discovery of the high grade Hotazel ore in the 1950's also led to the opening of Langdon, famous for stunning Tudorokite specimens, and the Hotazel mine, where the first of the soon to be world famous Rhodochrosite from the Kalahari field was discovered.

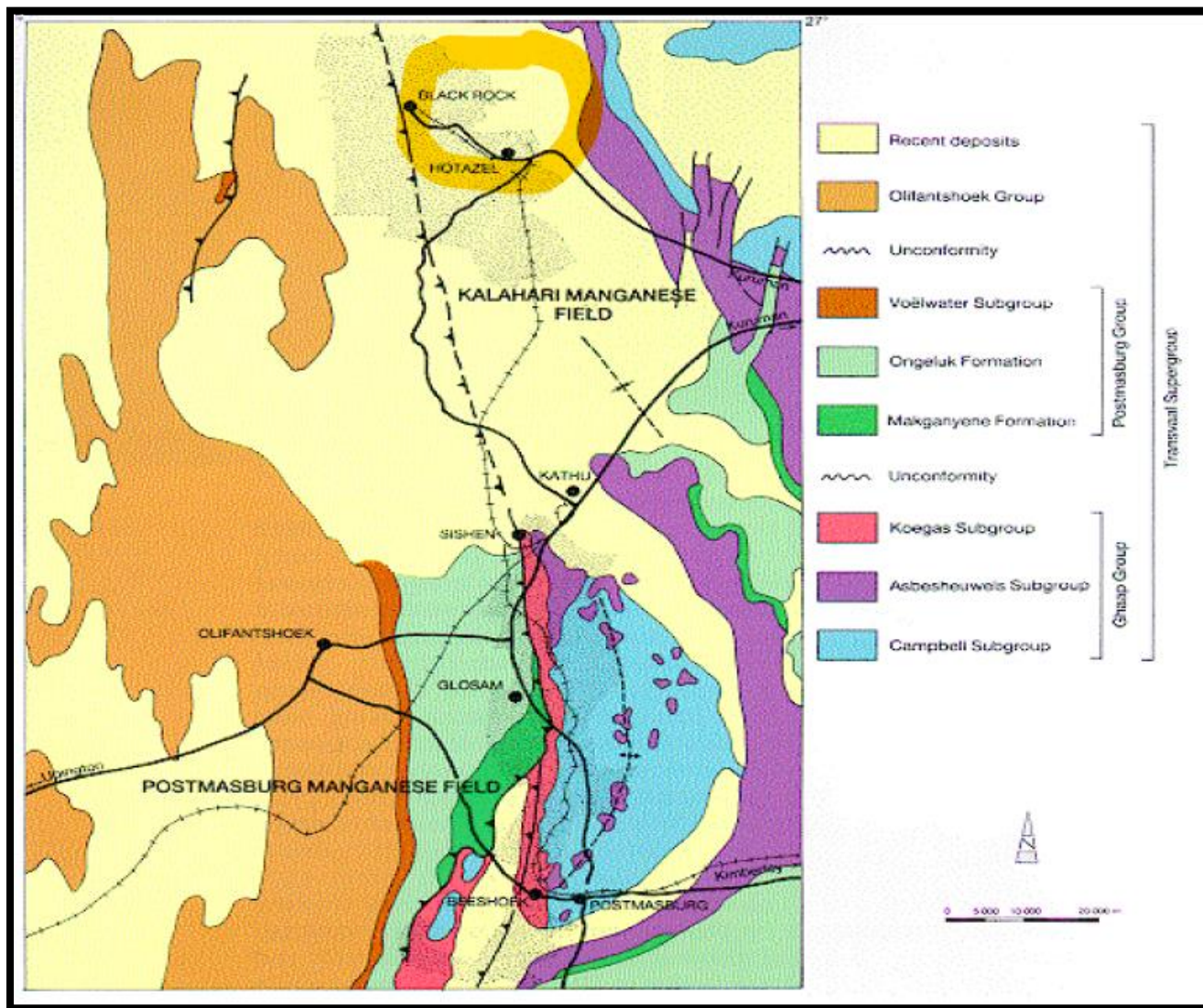


Figure 4: Geology of the Manganese and iron ore

From here expansion and growth kicks up a notch, with the opening of the Adams open pit in 1959 and Mamatwan in 1960. Mamatwan is the only early open pit to still be in operation Gloria, Belgravia and N'Chwaning I date back to the 1970's, following the installation of a private railway line by Assmang. This railway line made economic the opening of Wessels by Samancor in the same time span. Currently, Wessels and Gloria are still mining, with N'Chwaning I closed and replaced by N'Chwaning II in 2004, and later N'Chwaning III in 2006.

Development in the area is ongoing, with rapid expansion - Smartt was reopened in 2008 by the United Manganese of Kalahari, amongst others. Early ownership of the majority of mines by Assmang and Samancor has now been split between many companies, new entrants and titans like Anglo alike.

Most of the mining activities within the Joe Morelong and Gamagara areas are connected to the Sishen-Saldanha route. To this effect, mining and exploration activities occurring within the surrounding area includes *inter alia*:

- Wessels Mine (underground operation);
- Tshipi Mine (opencast mining);
- Mamatwan Mine (opencast mining);
- UMK Mine (opencast mining) and
- Kudumane (opencast mining).

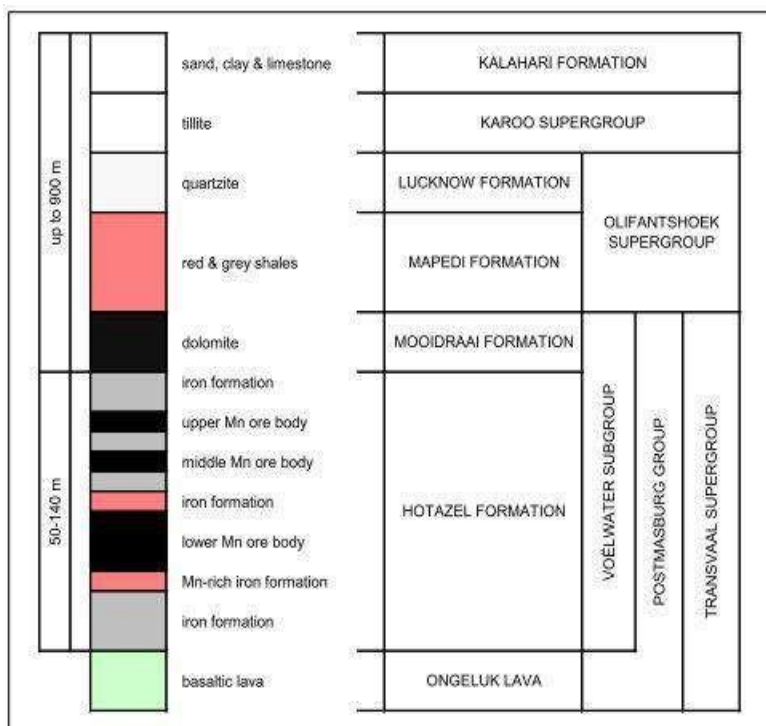


Figure 5: Stratigraphy of the Kalahari Manganese Field (Royal HaskoningDHV, 2013)

❖ Technological and Site Activity Alternatives

Due to the nature of the proposed prospecting activities future land use alternatives will not be compromised. Once available reserve has been confirmed a comprehensive social and environmental impact assessment will be required (in accordance with legislation), during which time alternative land use to mining would be investigated.

In terms of the technologies proposed, these have been chosen based on the long term success of the company in terms of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques. All infrastructure will be temporary and/or mobile.

3.4 Full description of the process followed to reach the proposed preferred alternatives within the site.

3.4.1 The property on which or location where it is proposed to undertake the activity;

The proposed prospecting will be on the Santoy 230: Remainer and Portion 1, Belgravia 264: Remainer and Portion 1 and Nchwaning 267: Portion 2 & 3: Gloria 255, Portion 1, located in the John Taolo Gaetsewe Municipality Northern Cape trending from 3km to 12km North of the town Hotazel.

3.4.2 Minerals applied for

Iron ore

3.4.3 The type of activity to be undertaken;

In terms of the technologies proposed, these have been chosen based on the long-term success of their prospecting history in this sector. Drilling allows for sampling and targeting the desired mineralisation as well as resources determination. The prospecting activities proposed in the PWP are depended on the preceding phase as discussed previously therefore no alternatives are indicated but rather a phased approach of trusted prospecting techniques.

3.4.4 The design or layout of the activity;

The sit layout and proposed drilling will be planned on areas where the geological data available indicating areas of high mineralisation potential after the geological mapping. The borehole locations will be submitted to the DMRE and the landowner.

3.4.5 The technology to be used in the activity;

All equipment to be used will be provided by contractors

Recycling: The prospecting project will in its operational phase implement recycling policies and measures for optimal utilisation of resources and minimisation of waste generation.

Stores and Material: A containerized store will be provided by the contractor, in the contractor's yard, to hold a limited store of high use items such as oils, grease, air filters etc. These stores will meet the requirements of the various health and safety and environmental legislation.

Electricity: Electricity is sourced from a mobile generator.

Water: Potable water at the project area will be sourced and transported to site by the contractor. The same water is also used for dust suppression when necessary.

Access Roads: The existing access tracks on site will be used to access drilling points. No new roads will be developed without prior communication with the landowner.

Offices: The contractor will provide a mobile office.

Energy:

Fuel types will be investigated as well as energy conserving measures will be implemented i.e. prospecting times will be during the day to save on using lights in the evening.

3.4.6 The option of not implementing the activity.

The option of not approving the activities will result in a significant loss to valuable information regarding the Iron ore reserve status on these properties. In addition to this, should economical reserves be present, and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost.

4 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Additional proof of consultation will be made available with the final BAR.

This section of the report provides an overview of the tasks undertaken for the PPP to date. All PPP undertaken is in accordance with the requirements of the EIA Regulations (2021). It further provides an outline of the next steps in the PPP and makes recommendations for tasks to be undertaken during the environmental assessment phase of the environmental authorisation process.

Landowners were identified through a search conducted via online search engines accessing the Title Deed office database. In addition to landowners, other relevant organisations were identified and notified of the application. This includes municipal and State departments with jurisdiction in the area and Non-Governmental Organisations (NGOs) with an interest.

A public meeting will be scheduled, advertised and held as part of the consultation. The meeting aimed to introduce the project and address concerns raised.

The PPP tasks conducted for the proposed project to date include:

1. Identification of key Interested and Affected Parties (affected and adjacent landowners) and other stakeholders (organs of state and other parties);
2. Formal notification of the application to key Interested and Affected Parties (all adjacent landowners) and other stakeholders;
3. Consultation and correspondence with I&AP's and Stakeholders and the addressing of their comments; and
4. Newspaper adverts.

I&AP and Stakeholder identification, registration and the creation of an electronic database

Public Participation is the involvement of all parties who are either potentially interested and or affected by the proposed development. The principle objective of public participation is to inform and enrich decision-making. This is also its key role in this Environmental Impact Assessment (EIA) process. Interested and Affected parties (I&Aps) have been identified preliminarily and it is expected that more I&AP's will register during the course of the consultation period.

4.1 Formal notification of the application to key Interested and Affected Parties (adjacent landowners) and other stakeholders

The project was announced as follows:

4.1.1 Newspaper advertisement

An advertisement will be published in English in a local newspaper announcing the project and requesting interested and affected parties to register, the availability of the Basic Assessment report and stating the date and place for the Public Meeting. All interested and affected parties are invited and welcome to attend this meeting.

4.1.2 Site notice placement

In order to inform surrounding communities and adjacent landowners of the proposed development, site notices will be erected on site and at visible locations close to the site.

4.1.3 Written notification

I&AP's and other key stakeholders will be notified of the project and public meeting. A background information document and landowner notification letter will be sent out to the identified I&AP's. The BAR was available for comment for at least 30 days. Hard Copies will be submitted to commenting authorities and their comments will be incorporated in the final BAR.

4.1.4 Background Information Document

A Background Information Document (BID) will be distributed (by email, fax or post) to landowners. The BID provides information concerning the proposed project and invited IAPs to register and to attend the public meeting. IAPs distributed the documents to other parties who may be interested or affected by the project.

4.1.5 Public Meeting

A public meeting will be advertised via email, site notices, background information documents and newspaper advertisement.

4.2 Consultation and correspondence with I&AP's and Stakeholders and the addressing of their comments (continuous).

Comments received regarding this project will be addressed and included in the final BAR.

4.3 Release of the Report to I&AP's and stakeholders for review and comment.

This report will be released to the public for public review and comment. All stakeholders and I&AP's are welcome to comment for 30 days. The DBAR will be available from the 25th of October to the 29th of November 2021.

Additional electronic and or hard copies will be made available to interested and affected parties and stakeholders who request for them. Hardcopies of the report were also submitted to all organs of state and relevant authorities.

4.4 Next Phases of the Public Participation Process

All comments and responses received and sent throughout the entire process will be captured and included in the comments and responses report which will be submitted to the Department of Mineral Resources. Proof of consultation will also be included.

5 BASELINE ENVIRONMENT

5.1 Type of environment affected by the proposed activity.

The application area is located in the John Taolo Gaetsewe District Municipality covering an Area of 27 322km². The John Taolo Gaetsewe District Municipality (previously Kgalagadi) is a Category C municipality located in the north of the Northern Cape Province, bordering Botswana in the west. It comprises the three local municipalities of Gamagara, Ga-Segonyana and Joe Morolong, and 186 towns and settlements, of which the majority (80%) are villages. The boundaries of this district were demarcated in 2006 to include the once north-western part of Joe Morolong and Olifantshoek, along with its surrounds, into the Gamagara Local Municipality. It has an established rail network from Sishen South and between Black Rock and Dibeng. It is characterised by a mixture of land uses, of which agriculture and mining are dominant. The district holds potential as a viable tourist destination and has numerous growth opportunities in the industrial sector. Main Economic Sectors: Agriculture, mining, retail.

Cities/Towns: Bankhara-Bodulong, Deben, Hotazel, Kathu, Kuruman, Mothibistad, Olifantshoek, Santoy, Van Zylsrus

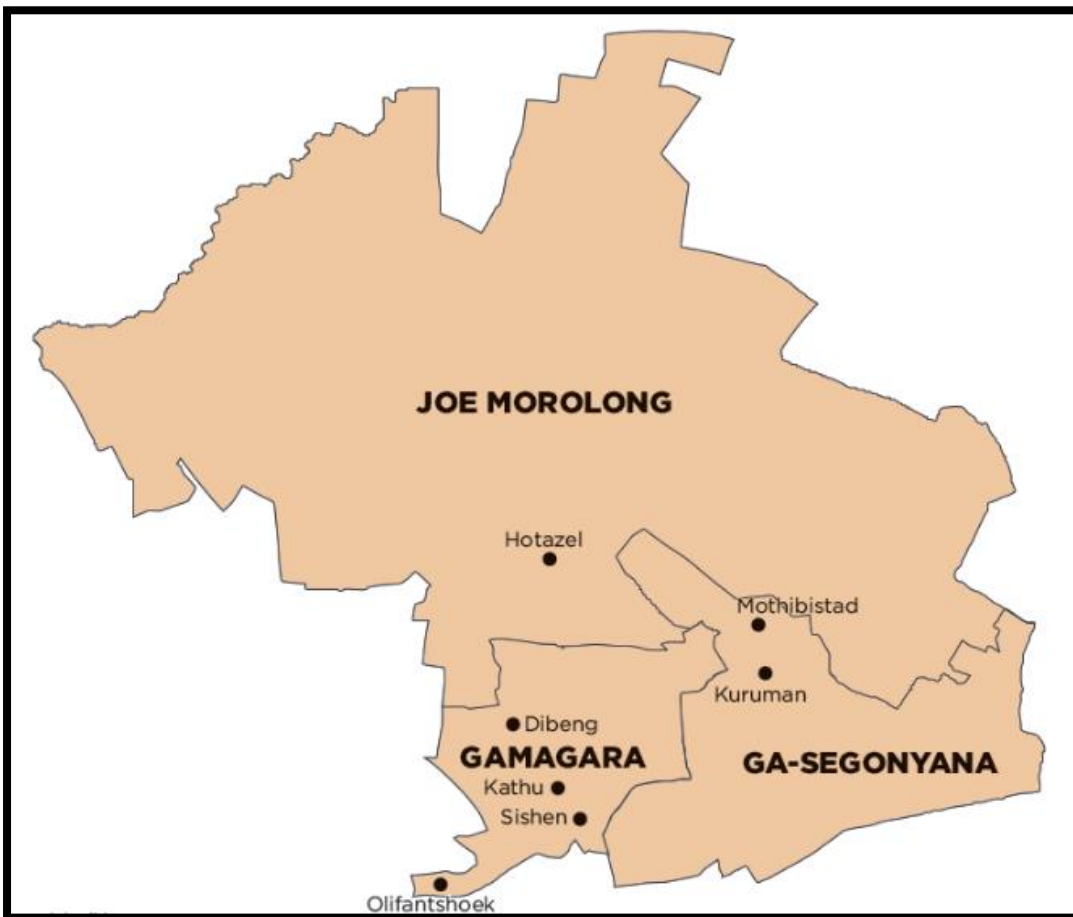


Figure 6: Municipal Location

5.1.1 Topography and Geography

The vicinity of the proposed project is characterized generally homogenous topography, which is mostly in the form of flat plain with valleys and high gradient hills.

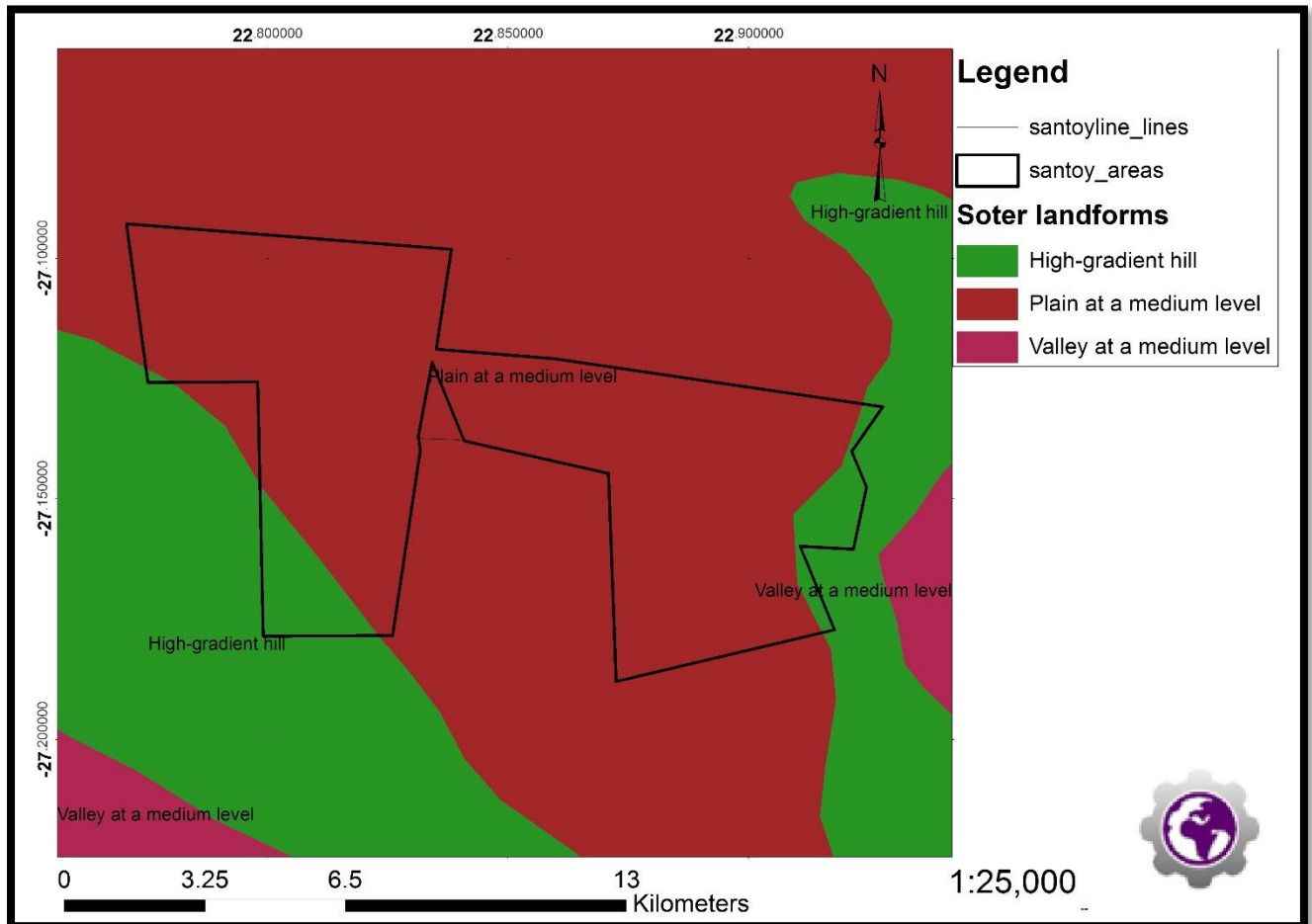


Figure 7: Relief Map

5.1.2 Climate

The Northern Cape region is semi-arid and receives an annual rainfall of between 250 to 500 millimeters, with the majority of rain falling in the summer months between October and March. On average the best rains fall in mid to late summer, with February and March being the wettest months. Thunderstorms are a common feature of the summer climate and hail may accompany summer storms (data obtained from the S.A. Weather Bureau for the Kuruman station).

The proposed mining operational area comprises of summer and autumn rainfall with very dry winters. The actual Mean Annual Precipitation (MAP) is about 358 mm. However, the maximum MAP can reach about 450 mm. The wet season occurs between the months of October to March. In addition, the mean monthly maximum and minimum temperatures

is about 35.9°C and -3.3°C for January and June respectively. Frost is frequent usually occurs in winter seasons. The Mean Annual Evaporation (MAE) is in the range between 2200-2600 mm (Bassom and Rossouw, 2003).

5.1.2.1 Wind

The most commonly occurring wind direction for Kathu region is SSE where the wind velocity is 3,0 m/s. Commonly the wind speed fluctuates between 1,6 m/s and 3,5 m/s although speeds in the range 3,6 m/s to 5,5 m/s are regularly recorded.

5.1.2.2 Air Quality

The diffusion of pollutants into the atmosphere is dependent on climatic conditions and local atmospheric stability, which may vary on a daily and seasonal basis. Potential sources of dust may be caused by moving vehicles and earthworks during drilling and pit sampling. Dust could also emanate from mining activities on the adjoining area.

5.1.3 Hydrology and Geohydrology

The area is situated within low rainfall region; average annual precipitation is approximately 324mm of which only 0.8mm (0.24%) ends up as run-off out of the catchments, augmented by the sandy nature of the soils facilitate infiltration and flat topography that prevent run-off. With this arid climate, there is thus extremely limited opportunity for wetland formation and no drainage lines are indicated within the study sites. The Ga-Mogara River is situated approximately 5km to the east of the site.

This river drains into the Kuruman River situated approximately 3km to the north. Both these rivers are indicated to have an extremely intermittent flow period, only flowing subsequent to significant flash flood periods. It is expected that runoff from local areas will be accurately represented by the results of WR2005 simulations. Approximately 1% of rainfall will run off and reach local river systems. The region contains large endoreic areas, where runoff is expected to seep into the earth or form temporal pools and be lost to evaporation.

The area falls within the Orange River Catchment (Primary Catchment D), with the affected quaternary catchments being D41K and D41M. These catchments receive on average approximately 324 mm of annual rainfall, of which approximately 0.8 mm (0.24 %) ends up as run-off out of the catchments (Middleton, B.J., Midgley, D.C and Pitman, W.V., 1990).

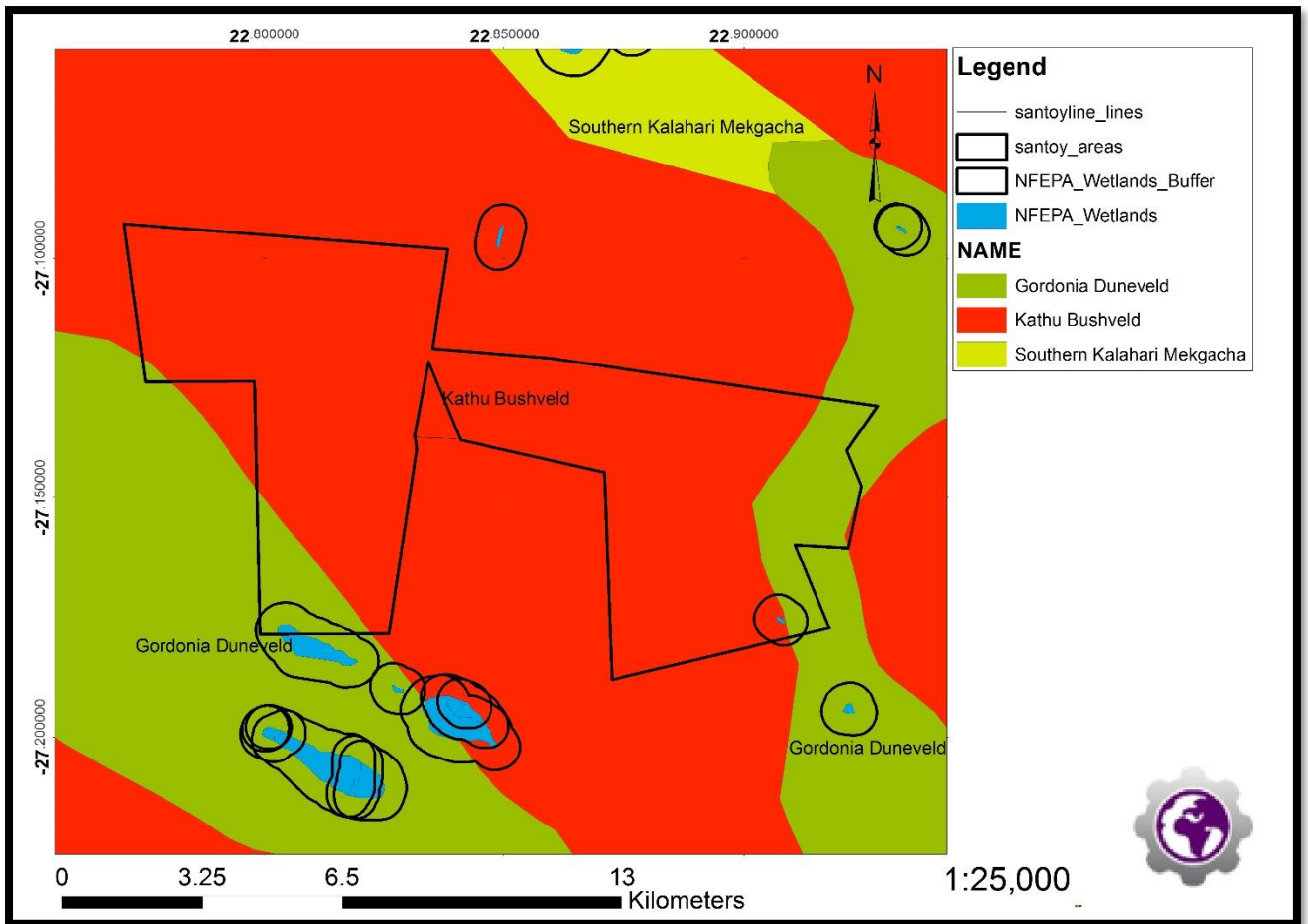


Figure 8: Surface hydrology and pans

Pans – these are small pans, only a few meters in diameter, which hold water for short periods after rainfall events that occur scattered within the terrestrial vegetation. They are mostly located within the valley floors. Water is kept within the pan basins either by underlying rock or calcrete that prevents the infiltration of water into the deep Kalahari sands that characterise most of the study area;

- Calcrete pans – These are the large pans also captured in the NWI data. It is speculated that these pans represent paleo-wetlands that were formed under a wetter climate in the past. The calcrete floor of the pans is considered to have formed due to the seasonal saturation of the soil profile. Under current conditions it is unlikely that the entire pan can become inundated following heavy rain, though the presence of the calcrete does prevent rainfall from infiltrating into the soil and small puddles are likely to form across the pan floor. Anecdotal evidence from local residents suggests that such pools can persist for several days to a week following heavy rain;

Olea europea pans – Three small depressions lined by large *Olea europea* trees occur within the larger calcrete pan on site. These three depressions are likely to hold water most regularly and for the most extended period following rainfall.

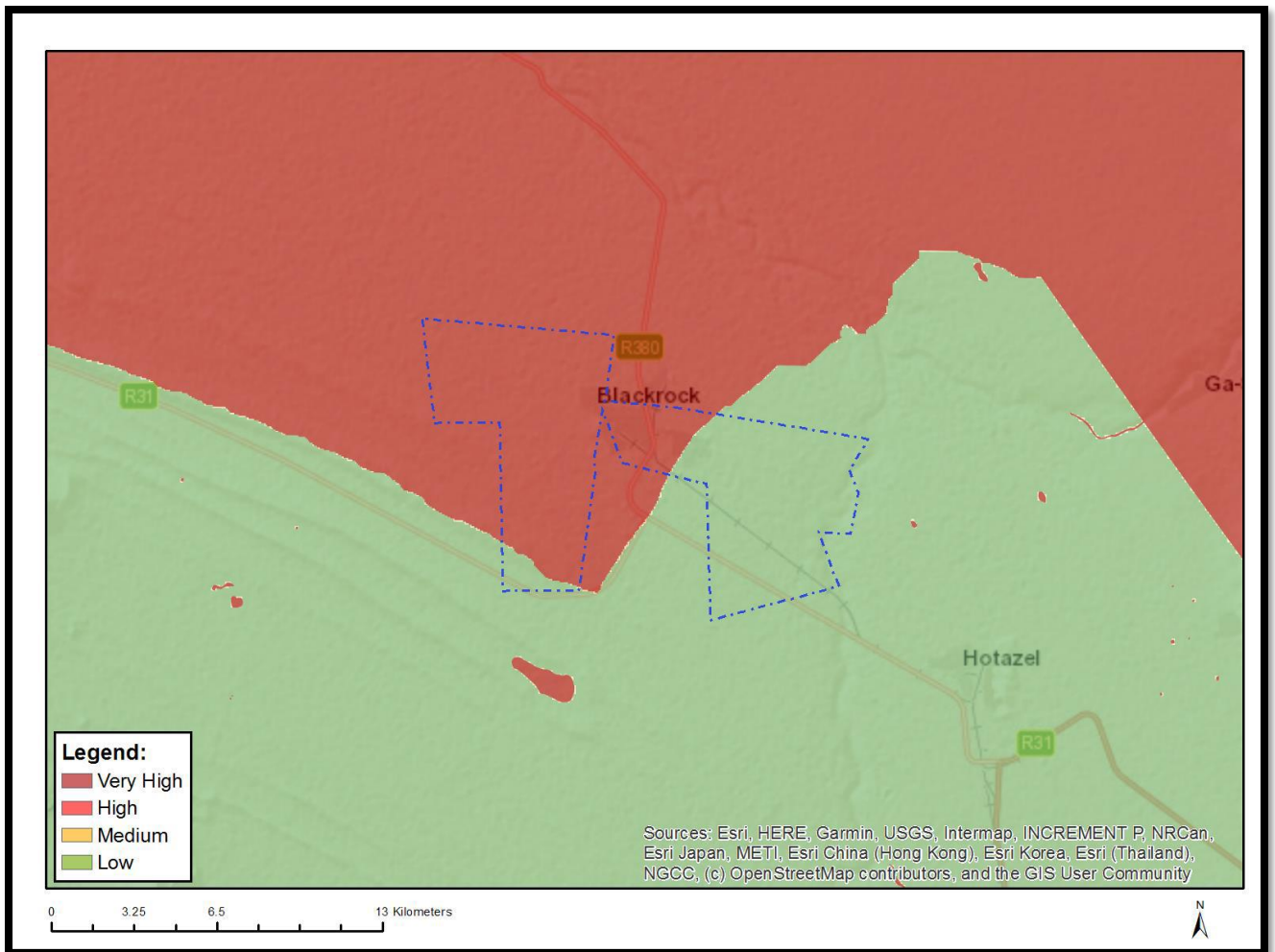


Figure 9: Map of Relative Aquatic Biodiversity Theme Sensitivity

5.1.4 Geology

A (very) brief introduction to the Iron – Manganese deposits

The manganese and associated iron of the Transvaal Supergroup were deposited in an ancient shallow sea on the border of the Kaapvaal Craton, hosting some of the oldest rocks on our continent. The Transvaal Supergroup was deposited between 2200 and 2600 million years ago, and is an exceptionally well-preserved succession, allowing one to examine in detail the depositional environment of the late Archean to early Proterozoic time span. Indeed, the Transvaal Supergroup is considered to be one of the geological wonders of the world, as most of these early depositional systems have undergone massive deformation throughout the course of geological history. The Transvaal Supergroup itself, with reference to the Kalahari Manganese deposit, can be described according to the geological map presented in the Manganese below:

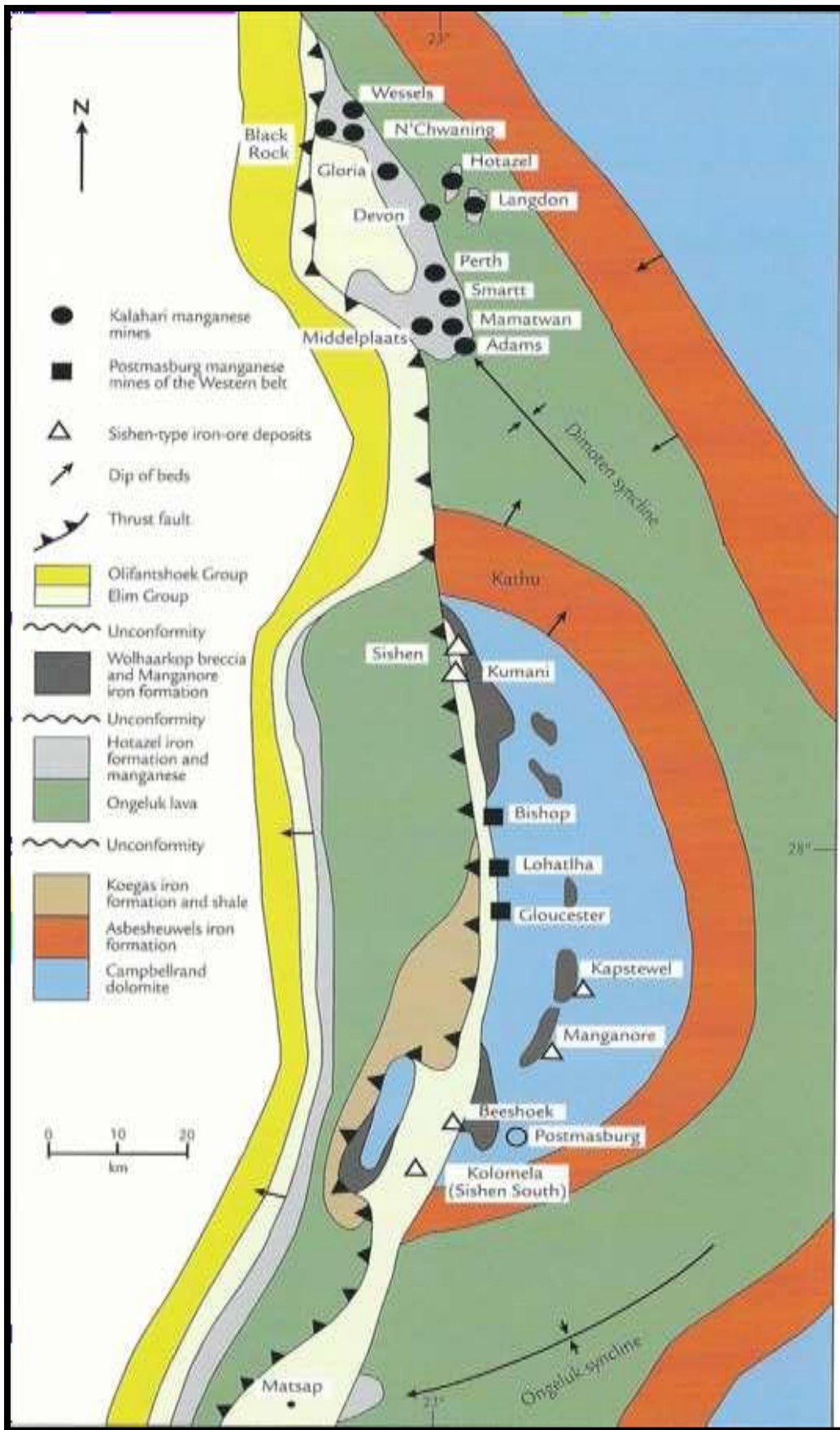


Figure 10: Geology of the Manganese and iron ore

The giant Kalahari manganese field, situated 60 km northwest of Kuruman in the Northern Cape Province of South Africa (Fig. 1), is the largest known land-based manganese deposit in the world, hosting more than 80 % of the world's minable manganese resources (Vermaak, 1997).

Mamatwan-type ore is the major iron ore in the Kalahari basin. It is primarily a diagenetic to low-grade metamorphic ore, consisting of braunite matrix and abundant primary carbonates and ovoids of kutnohorite. Minor minerals also include hausmannite, cryptomelane, jacobsite and hematite. This type of ore is found in the Mamatwan, Middelplaats, Adams, Perth, Smartt, Gloria and Devon Mines.

The iron ore bodies in the north-western part of the Kalahari manganese field (Wessels, Black Rock and N'Chwaning Mines) have been termed **Wessels-type ore**. These ore bodies contrast markedly to the primary Mamatwan-type ore. The ore has been hydrothermally altered and metamorphosed. This resulted in an iron ore with a coarser grain size with higher manganese content. This ore is braunite-rich and contains other major minerals such as braunite II, bixbyite, hausmannite, marokite and hematite together with minor amounts of calcite. The overall carbonate content of the Wessels-type ore is lower than that of the Mamatwan-type ore. Andradite and barite are common gangue minerals. Additionally, minor minerals such as tephroite and rhodochrosite as well as aegirine (in the iron formation above the ore layers) are associated with this ore type.

Most of the Wessels, Black Rock, N'Chwaning II and parts of N'Chwaning I ores are of this type.

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Mines of the Kalahari Manganese Fields

The first mine to open is the iconic Black Rock mine, in 1940, with underground operations beginning in 1942. This was followed in quick succession by Devon in 1954 and Smartt in 1959, by Assmang and Samancor respectively. The discovery of the high grade Hotazel ore in the 1950's also led to the opening of Langdon, famous for stunning Tudorokite specimens, and the Hotazel mine, where the first of the soon to be world famous Rhodochrosite from the Kalahari field was discovered.

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Gloria, Belgravia and N'Chwaning I date back to the 1970's, following the installation of a private railway line by Assmang. This railway line made economic the opening of Wessels by Samancor in the same time span. Currently, Wessels and Gloria are still mining, with N'Chwaning I closed and replaced by N'Chwaning II in 2004, and later N'Chwaning III in 2006.

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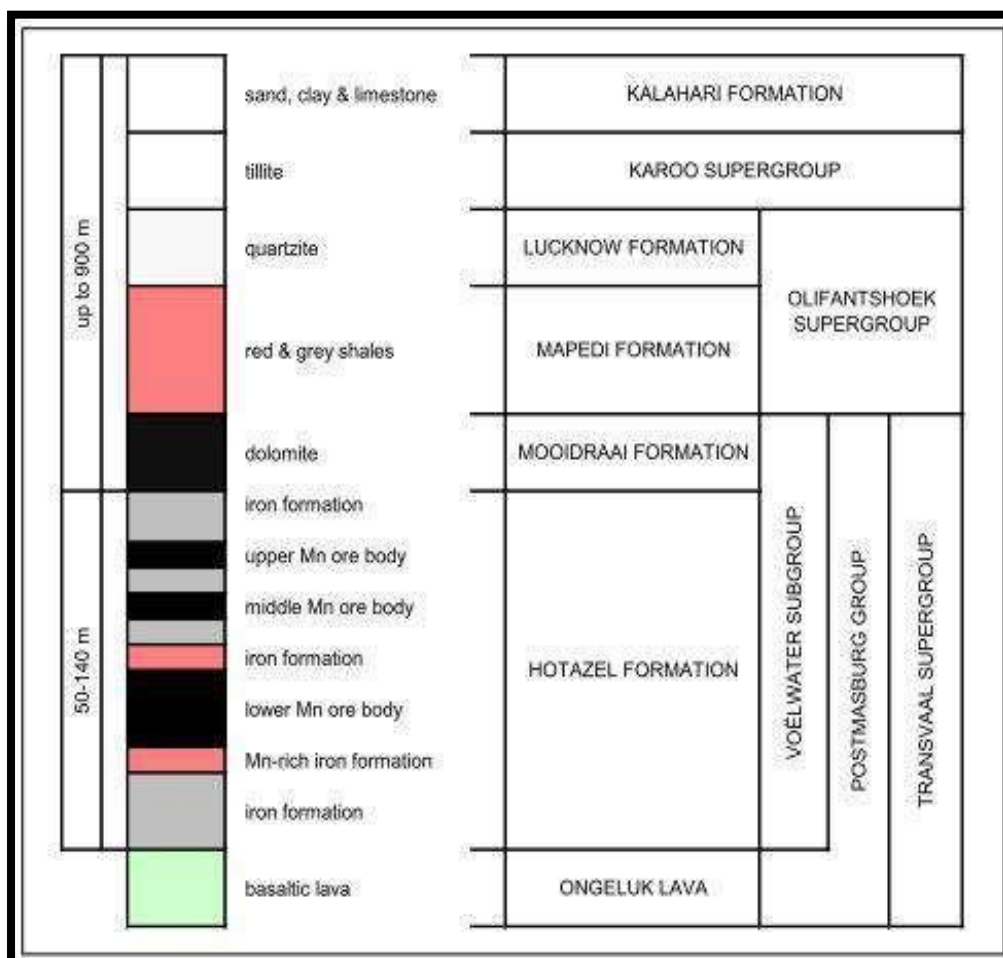


Figure 11: Stratigraphy of the Kalahari Manganese Field (Royal HaskoningDHV, 2013)

5.1.5 Soils

The soil type on site is AR Arenols which are red-yellow and greyish excessively drained sandy soils with relatively low/ limited agricultural potential and Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. (association of Leptosols, Regosols, Calcisols and Durisols. In addition, one or more of Cambisols, Luvisols. Land Type Ah5 consist of freely drained, red and yellow-brown apedal soils that are freely drained with no restrictive clay layers in the sub-surface horizons but may consist of shallow profiles due to the presence of restrictive rock layers.

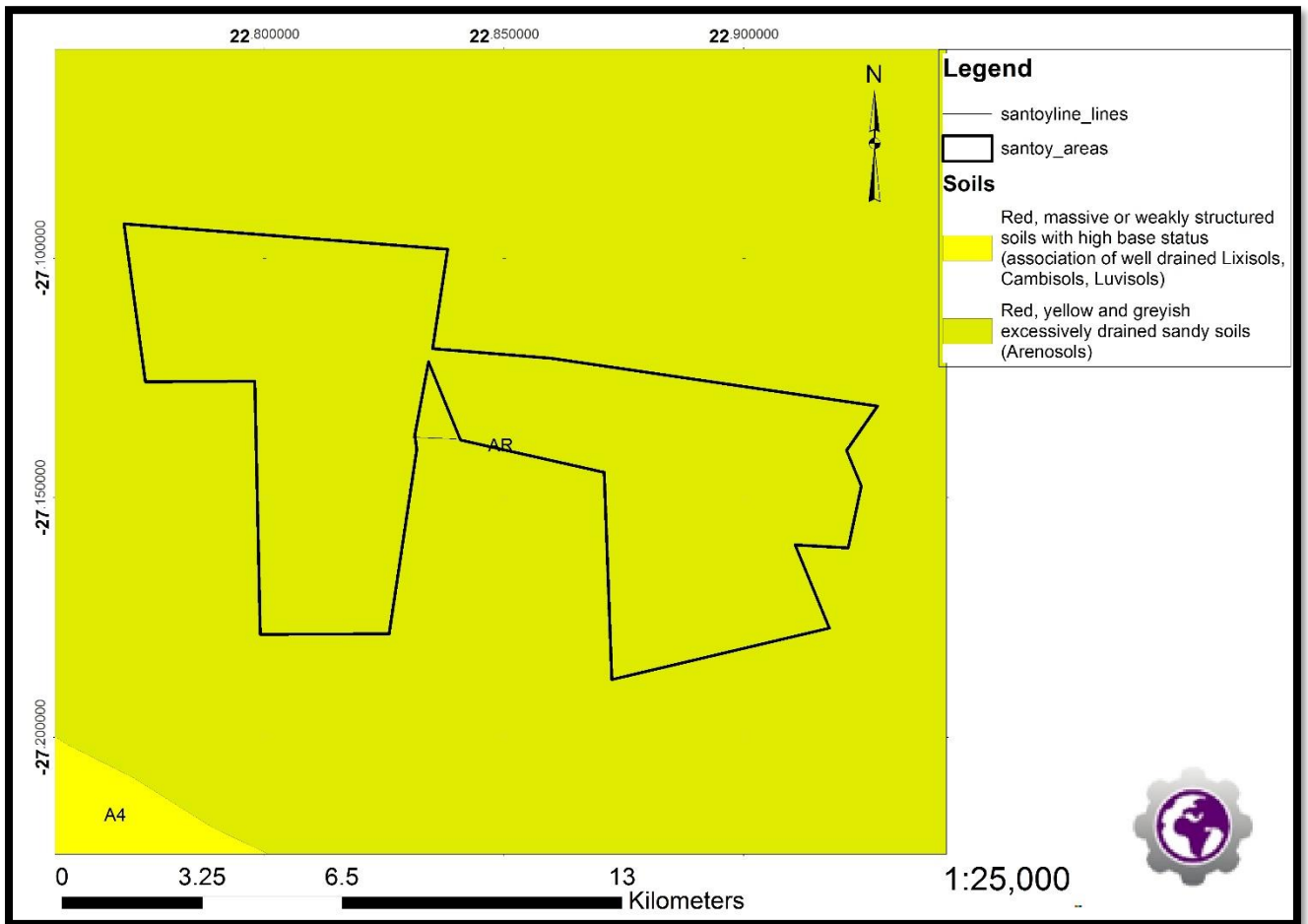


Figure 12:Soils

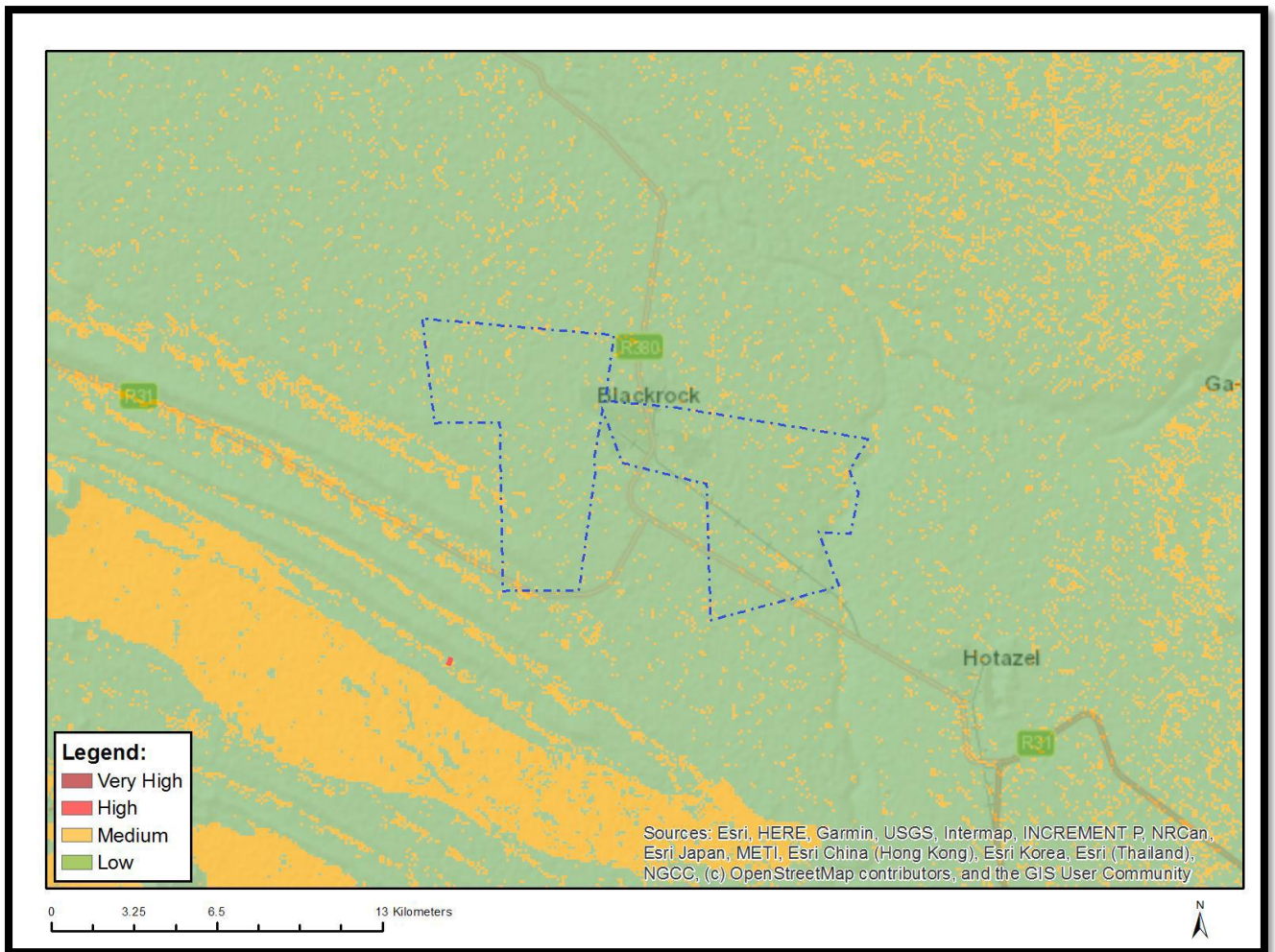


Figure 13: Map of Relative Agriculture Theme Sensitivity

5.1.6 Vegetation

There are 2 main vegetation types in the application area viz Khatu Bushveld and Gordonia Duneveld, none of these are of threatened or protected.

5.1.6.1 Khatu Bushveld

This vegetation type is situated on the plains of Kathu and Dibeng in the south, through Hotazel, vicinity of Frylinkspan to the Botswana border roughly between Van Zylsrus and McCarthysrest. The vegetation comprehends a medium-tall tree layer with *Acacia erioloba* in places, but mostly open and including *Boscia albitrunca* as the prominent trees. The shrub layer is generally most important with, for example, *A. mellifera*, *Diospyros lycioides* and *Lycium hirsutum*. The grass layer is variable in cover and composition. Species that typifies this unit include trees (*Acacia erioloba*, *A. mellifera* subsp. *detinens*, *Boscia albitrunca* and *Terminalia sericea*); tall Shrubs (*Grewia flava*, *Diospyros lycioides*, *Dichrostachys cinerea*, *Gymnosporia buxifolia* and *Rhigozum brevispinosum*); low shrubs (*Aptosimum decumbens*, *Grewia retinervis*, *Nolletia arenosa*, *Sida cordifolia* and *Tragia dioica*); Graminoids (*Aristida meridionalis*, *Brachiaria nigropedata*, *Centropodia glauca*, *Eragrostis lehmanniana*, *Schmidtia pappophoroides*, *Stipagrostis ciliata*, *Aristida congesta*, *Eragrostis biflora*, *E.*

Chloromelas, *E. heteromera*, *E. pallens*, *Melinis repens*, *Schmidtia kalahariensis*, *Stipagrostis uniplumis* and *Tragus berteronianus*); and Herbs (*Acrotome inflata*, *Erlangea misera*, *Gisekia africana*, *Heliotropium ciliatum*, *Hermbstaedtia fleckii*, *H. odorata*, *Limeum fenestratum*, *L. viscosum*, *Lotononis platycarpa*, *Senna italic* subsp. *arachoides* and *Tribulus terrestris*). Biogeographically, important species that are present in this unit include the small tree *Acacia luederitzii* var. *luederitzii*; the graminoid *Antheophora argentea*, *Megaloprotachne albescens*, *Panicum kalaharensis*; and the herb *Neuradopsis bechuanensis*. The regional diversity distribution records indicate the presence of only 78 plant species within the ¼-degree grids that are sympatric to the study area, reflecting a poor floristic knowledge of the region. Results of previous surveys within the region indicate that much higher species diversity is expected; also taking cognisance of the habitat variation that presents itself within the region. The savanna physiognomy is manifested in the dominant growth forms of the region, physiognomically dominated by trees and shrubs and grass dominated dunes.

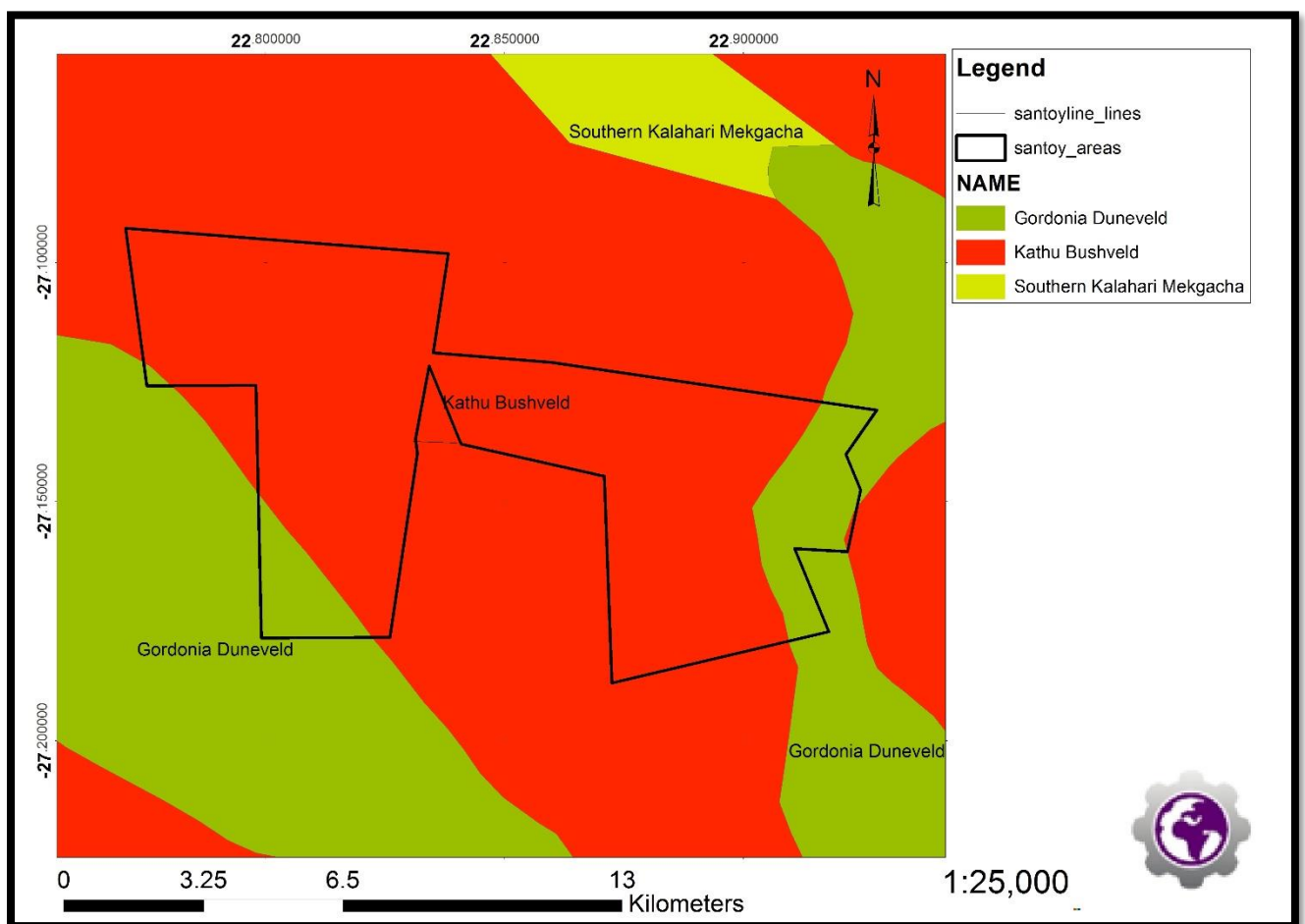


Figure 14: Vegetation Map

5.1.6.2 Gordonia Duneveld.

This unit also occurs as a number of loose dune cordons south of the Orange River near Keimoes and between Upington and Putsonderwater. It is typically an open shrubland with ridges of grassland dominated by *Stipagrostis amabilis* on the dune crests and *Acacia haematoxylon* on the dune slopes, also with a mellifera on lower slopes and *Rhigozum trichotomum* in the interdune streets are typical of this unit. The conservation status of this unit is regarded Least

Threatened with only 14% statutorily conserved in the Kgalagadi Transfrontier Park. Very little of the area is transformed and erosion is very low. Species that typifies this area include small tree (*Acacia mellifera* subsp. *Detinens*); tall shrubs (*Grewia flava* and *Rhigozum trichotomum*) low shrubs (*Aptosimum albomarginatum*, *Monechma incanum* and *Requienia sphaerosperma*); succulent shrubs (*Lycium bosciifolium*, *L. pumilum* and *Talinum caffrum*); and graminoids (*Schmidtia kalahariensis*, *Brachiaria glomerata*, *Bulbostylis hispidula*, *Centropodia glauca*, *Eragrostis lehmanniana*, *Stipagrostis ciliata*, *S. obtusa* and *S. uniplumis*) Biogeographically, important taxa (Kalahari Endemics) include the tall shrub *Acacia haematoxylon*, the graminoids *Stipagrostis amabilis*, *Antheophora argentea*, *Megaloprotachne albescens* and the herbs *Helichrysum arenicola*, *Kohautia ramosissima* and *Neuradopsis austro-africana* (Mukulu Project, 2012)

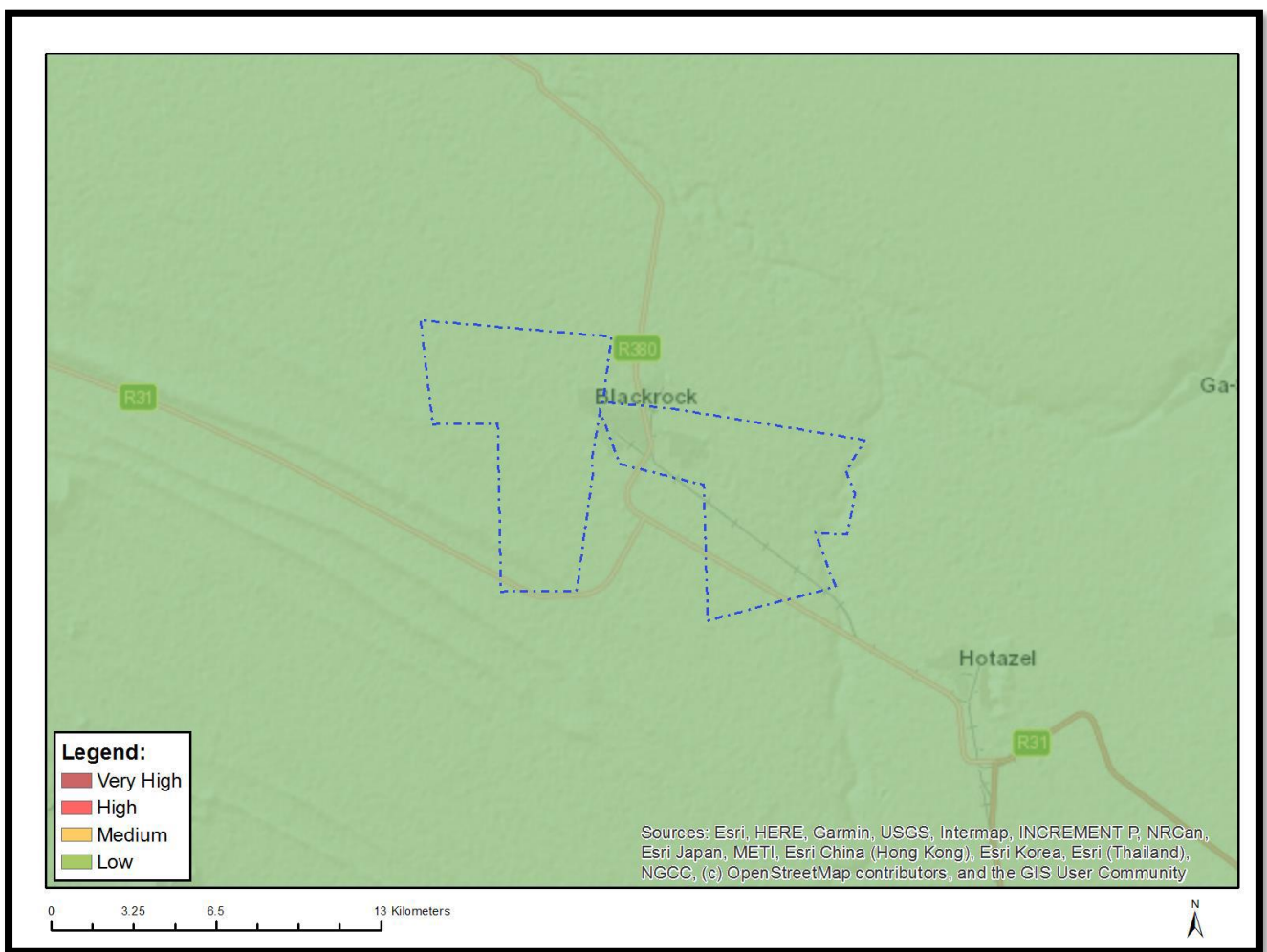


Figure 15: Map of Relative Plant Species Theme Sensitivity

- **Conservation Importance**

Both vegetation classes are classified as non-threatened..

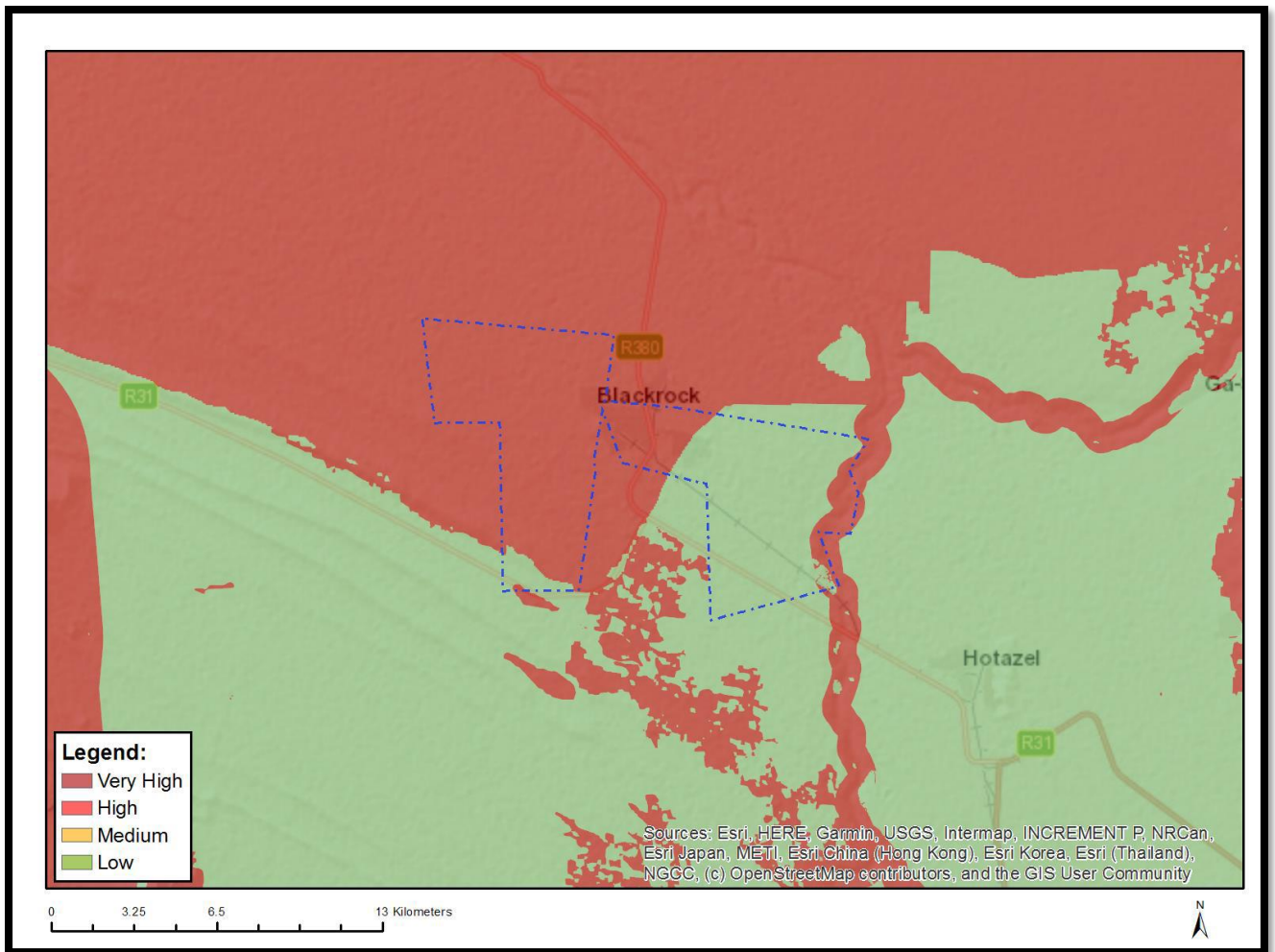


Figure 16: Map of Relative Terrestrial Biodiversity Theme Sensitivity

5.1.7 Heritage Resources

The background study revealed that the area was inhabited by descendants of the Khoisan and early colonial settlers.

- Because archaeological artefacts generally occur below the surface, the possibility exists that culturally significant material and skeletal remains may be uncovered during the construction and operational phases of the development. Should any artefacts or skeletal remains be uncovered, all activities must be suspended, pending further archaeological investigations by a qualified archaeologist in terms of Section 36 (6) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999); and
- Should the need arise to expand the development to beyond the study area the following applies: A qualified archaeologist must conduct a full Phase 1 Archaeological Assessment on the area beyond the study area, which will be affected by the expansion of the development, in order to determine the occurrence an extent of any archaeological sites and the impact the expansion of the development might have on these sites.
- Given the nature of the proposed prospecting activities, it is not likely to adversely impact on any archaeological material of the area. However, it should be indicated that if one of the prospecting sampling sites fall on the site

where stone tools were recorded, a professional archaeologist should be made available to monitor and document all chance finds.

- In the absence of confirmable archaeological or physical cultural resources along the larger project receiving environment, it is recommended that the project be exempted from any further archaeological assessment studies. However, it should be indicated that if one of the prospecting sampling sites fall on the site where stone tools were recorded, a professional archaeologist should be made available to monitor and document all chance finds. This will also aid in the establishment of whether the densities are universally low, or not. The Environmental Control Officer or any person responsible for site management should be aware of the indicators of sub-surface sites, this may include the following:
 - Bone concentrations, either animal or human,
 - Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate),
 - Ceramic fragments, including potsherds,
 - Bone concentrations,
 - Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial),
 - Fossilised remains of fauna and flora, including trees.
- All construction within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or SAHRA officer should be contacted immediately. In the meantime, it is the responsibility of the Environmental officer and the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. It is mandatory to report any incident of human remains encountered to the South African Police Services, SAHRA staff member and professional archaeologist. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA or a professional archaeologist.

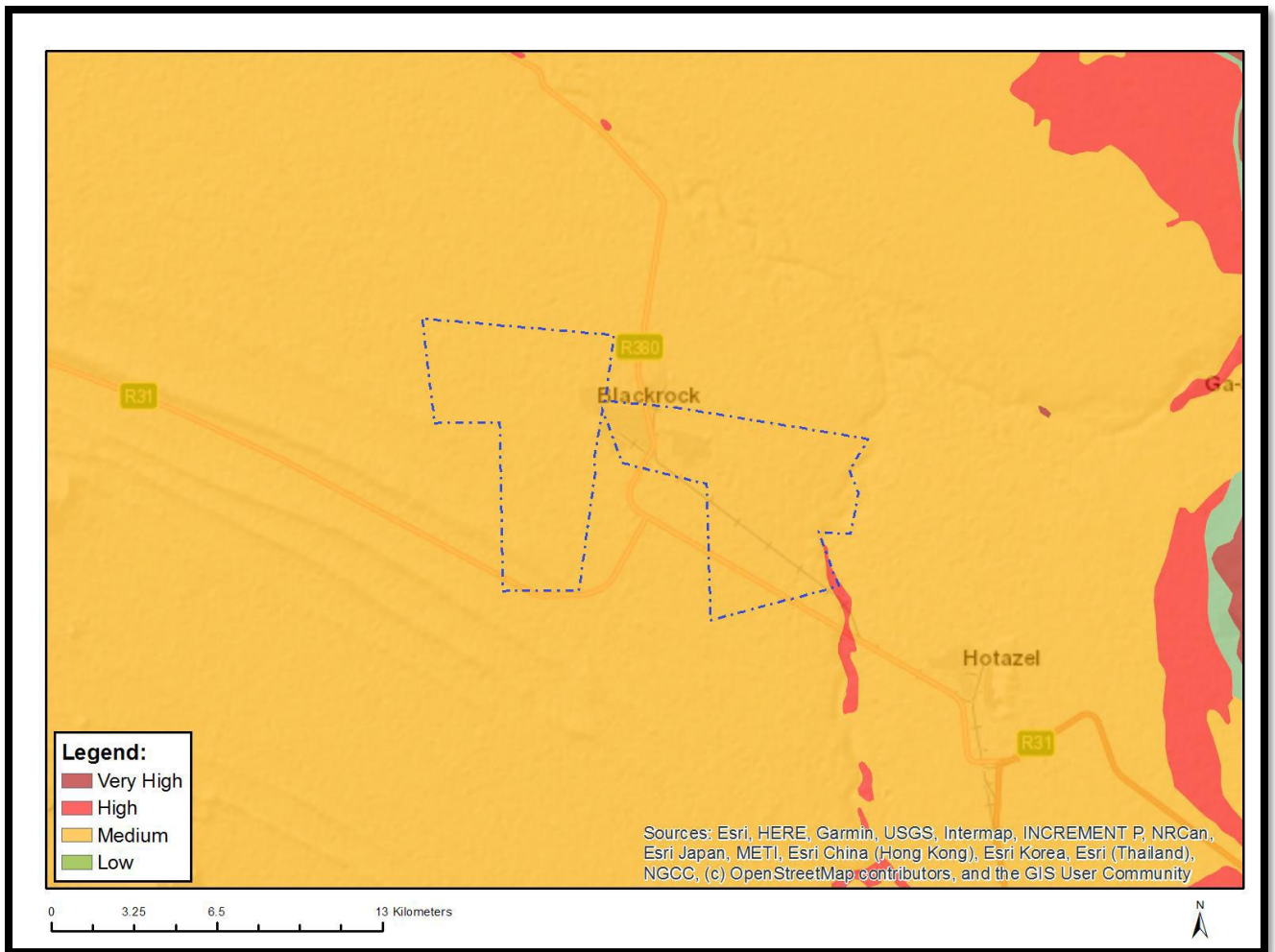


Figure 17: Map of Relative Paleontological Sensitivity

5.2 Regional Socio-Economic Structure

The John Taolo Gaetsewe District Municipality (JTGDM) is situated in the Northern Cape Province and is bordered by (1) The Siyanda and Francis Baard District Municipalities to the south and west; (2) The North West Province (Dr. Ruth Segomotsi Mompati District Municipality) to the east and northeast; and (3) Botswana to the northwest. Administratively, the JTGDM comprises three Local Municipalities: (1) The Gamagara Local Municipality; (2) The Ga-Segonyana Local Municipality; and (3) The Joe Morolong Local Municipality, which encapsulates the geographical area covered by the former District Management Area and the former Moshaweng Local Municipality. (Source: *JT Gaetsewe 2011-12 SDF Review*) JT Gaetsewe is the second smallest district in the Northern Cape, occupying only 6% of the Province (27 293 km²). The largest area within JT Gaetsewe is the former District Management Area (DMA) with over 10 000 km². Joe Morolong covers the next largest area of 9 477 km² (KDM, IDP 2006). The JT Gaetsewe District comprises of 186 towns and settlements of which the majority (80%) are villages in the Joe Morolong Municipality.

In terms of *local population dynamics*, the Joe Morolong LM experienced the bulk of the population

decline, with this LM's population shrinking from 97 945 in 2001 to 89 530 i.e. a decline of -8.6%. The two biggest contributing factors for this dynamic are (1) out-migration from this LM to the Ga-Segonyana and Gamagara LM's, notably the towns of Kuruman and Kathu, and (2) the prevalence of HIV and AIDS in the area. While both the Ga-Segonyana and Gamagara LM's have been recipients of migrants from the Joe Morolong LM, it is the Gamagara LM that has seen a 79.40% and Ga-Segonyana LM an increase of 33% in population during the period 2001 to 2011. There is an increase of 1.60% in the population of the District, compared to the 1.44% for the Northern Cape Province. This may be indicative of the growth in mining activities since 2001.

The average **household size** in the DM in 2007 was 4.06, which was slightly higher than the provincial figure of 3.93 and the national figure of 3.81. It was also the second highest figure amongst the five DM's in the NC Province. The JTGDM figure is markedly lower than the figure for 2001, when the household size in the district was 4.3 (CSIR, 2011). The same downward trend is visible in two of the three LM's in the district, with the household size in (1) the Gamagara LM declining from 4.4 in 2001 to 3.7 in 2004, and (2) the Joe Morolong LM from 4.1 to 3.7. The decline is largely the result of a decline in the former DMA, with the household size declining from 3.6 in 2001 to 2.9 in 2007. In the case of the former Moshaweng LM, the household size declined only marginally from 4.6 in 2001 to 4.5 in 2007 (*Source: JT Gaetsewe 2011-12 SDF Review*). The downward trend in the average household size continued in the 2011 and was 3.73.

5.2.1 Main Economic Sectors

- Agriculture,
- Mining,
- Retail.

5.2.2 Demographic Profile

The demographic profile is tabulated below:

	2016	2011
Population	242 264	224 799
Age Structure		
Population under 15	31.9%	34.0%
Population 15 to 64	63.3%	61.2%
Population over 65	4.8%	4.8%
Dependency Ratio		
Per 100 (15-64)	57.9	63.3
Sex Ratio		
Males per 100 females	96.5	94.1
Population Growth		
Per annum	1.70%	n/a
Labour Market		
Unemployment rate (official)	n/a	29.7%
Youth unemployment rate (official) 15-34	n/a	37.2%
Education (aged 20 +)		
No schooling	9.8%	14.6%
Matric	25.5%	20.5%
Higher education	6.8%	8.4%
Household Dynamics		
Households	72 310	61 331
Average household size	3.4	3.5
Female headed households	40.6%	43.1%
Formal dwellings	80.6%	76.6%
Housing owned	76.1%	55.1%
Household Services		
Flush toilet connected to sewerage	27.3%	26.2%
Weekly refuse removal	24.0%	26.0%
Piped water inside dwelling	19.2%	22.6%
Electricity for lighting	86.3%	87.0%

Figure 18: Demographic Information

5.3 Description of the current land uses.

The application area has road and signs of previous disturbances from mining related activities. No land claims have been confirmed yet for the study area, the request has been submitted to the relevant authorities.

5.3.1 Description of specific environmental features and infrastructure on the site.

The land comprising the application area is characterised by roads, mining areas and the study area was disturbed by historical mining.

5.3.2 Environmental and current land use map.

(Show all environmental, and current land use features)

The land is used for mining (Mukulu Project), farming (sheep) and open veld.

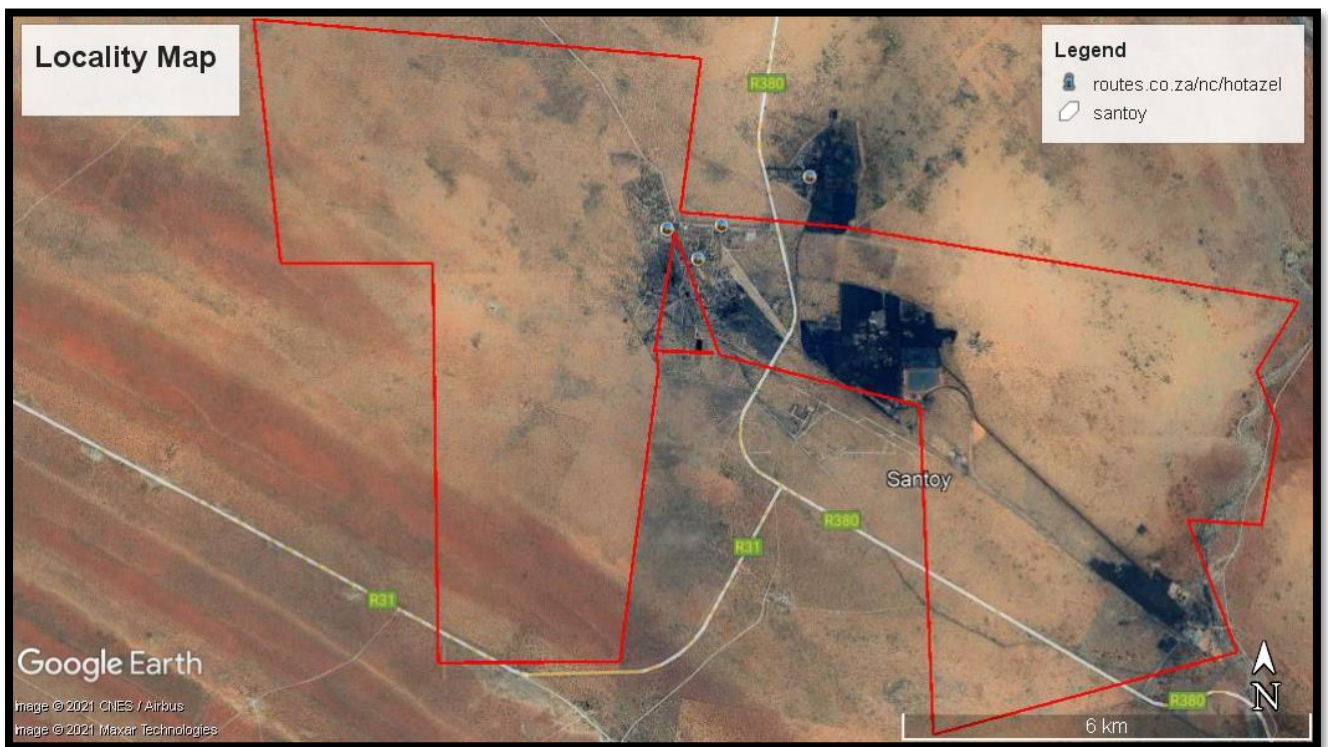


Figure 19: Mining, farming and open Veld

5.3.2.1 Roads

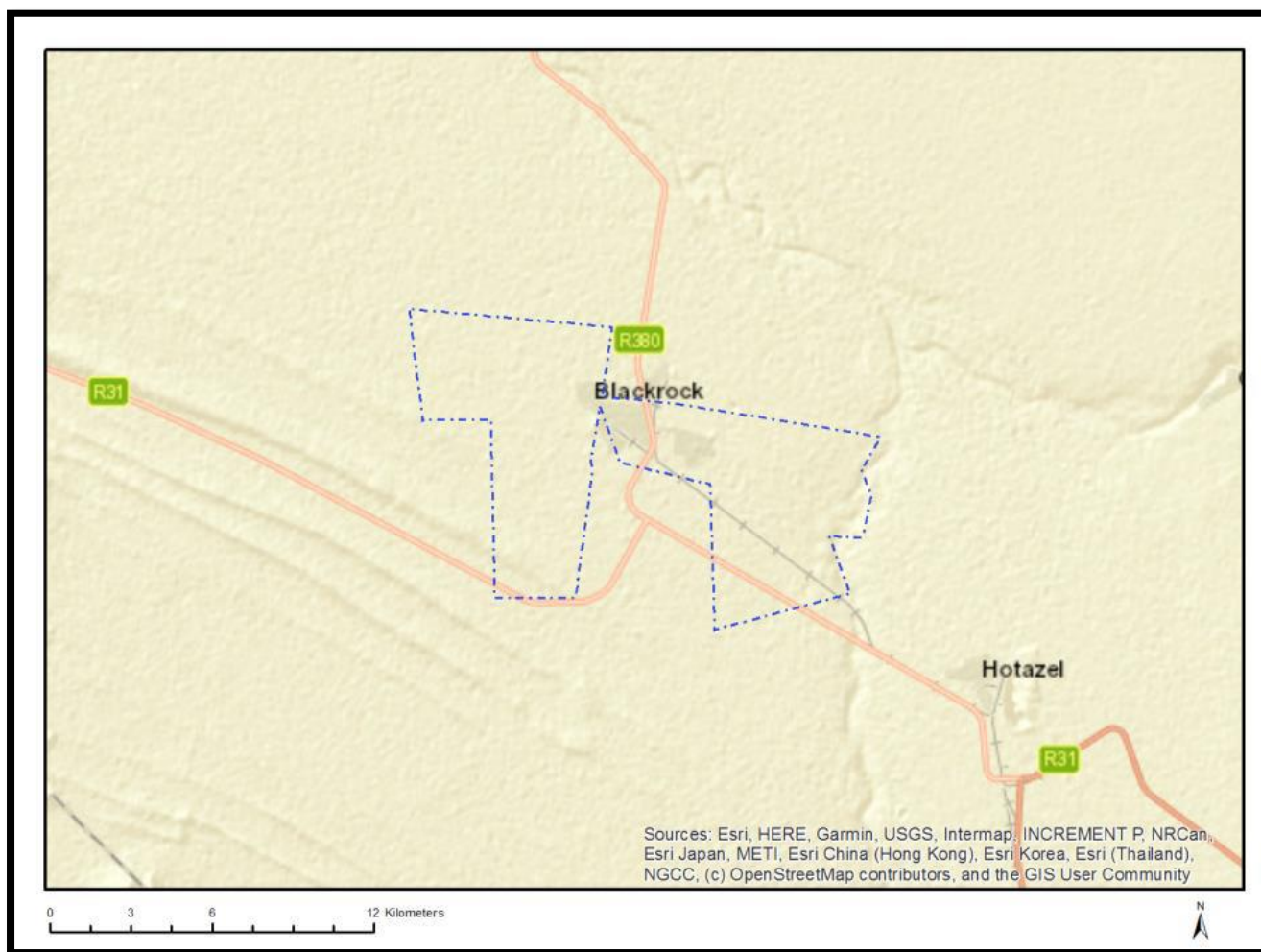


Figure 20: Major Roads

5.3.3 Screening tool Description of specific environmental features and infrastructure on the site.

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

5.3.4 Environmental sensitivity screening.

(Show all environmental, and current land use features)

The Screening Tool Report generated from the National Web Based Environmental Screening Tool in accordance with the latest NEMA Minimum Requirements and Protocol for Specialist 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” (10 May 2020).

5.3.4.1 Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2567	Solar PV	Approved	24
2	12/12/20/2566	Solar PV	Approved	24
3	14/12/16/3/3/2/6 16	Solar PV	Approved	28.1
4	14/12/16/3/3/2/6 15	Solar PV	Approved	0

5.3.4.2 Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

5.3.5 Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

- Agricultural Impact Assessment
- Archaeological and Cultural Heritage Impact Assessment
- Palaeontology Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Aquatic Biodiversity
- Impact Assessment
- Noise Impact Assessment
- Radioactivity Impact Assessment
- Plant Species Assessment
- Animal Species Assessment

5.3.6 Description of aspects to be assessed by specialists

The identified specialists will use the following gazetted protocols available on the link provided in the table below:

No	Specialist assessment	Assessment Protocol	Recommended Studies
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedGeneral_Agriculture_Assessment_Protocols.pdf	Information collated from previous studies and SANBI as none of the vegetation falls within CBA's or ESA.
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedGeneral_Requirement_Assessment_Protocols.pdf	To be assessed
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedGeneral_Requirement_Assessment_Protocols.pdf	To be assessed
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedTerrestrial_Biodiversity_Assessment_Protocols.pdf	Information collated from previous studies and SANBI
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedAquatic_Biodiversity_Assessment_Protocols.pdf	Watercourses have been identified and buffer zones implemented.
6	Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedNoise_Impacts_Assessment_Protocol.pdf	The drilling will be temporary hence no noise impact assessment will be undertaken.
7	Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedGeneral_Requirement_Assessment_Protocols.pdf	None of the elements are naturally radioactive hence the study is not required.
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedPlant_Species_Assessment_Protocols.pdf	Information collated from previous studies and SANBI
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GazettedAnimal_Species_Assessment_Protocols.pdf	Information collated from previous studies and SANBI

A general view of the existing socio-economic structures of the project area will be addressed to identify relevant social aspects and predict the anticipated future social developments and/or changes in the receiving human environment;

- Provide a baseline study describing the environmental socio-economic factors of the affected population;
- Assess negative and positive impacts associated with the project;
- Identify feasible mitigation measures and benefits related with the project.

5.4 Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

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

Table 4: Potential Impacts

ACTIVITY	ASPECT	TYPE OF IMPACT	IMPACT DESCRIPTION
Reconnaissance site visit	No Impact		
Desktop Study	No Impact		
Mapping & Surveying	Vegetation	Negative Medium	Clearing of Vegetation for access to the site
Drilling and sampling	Flora	Negative Medium	Clearing of Vegetation for Access tracks and Clearing of Drilling sites
	Fauna	Negative Medium	The natural habitat of the animals will be disturbed and/or destroyed. Potential roadkill
	Soil	Negative Medium	Removal of topsoil at the drilling and pitting sites
			Soil disturbance from soil sampling resulting in soil erosion
			Soil compaction resulting from repeated use of access roads.
			Oil and Fuel spills from drilling equipment
	Water	Negative Medium	Contamination of ground water and reduction of water quantity
			Change in drainage patterns on areas where the drilling and sampling will occur
			Possible hydrocarbon spills from drill rig. Increased water consumption as water will be used to control dust and for sampling
	Air	Negative Low	Generation of dust on the access tracks and drilling points
Noise	Negative Low	Noise from the drill rig	
Access Road	Air quality	Negative Low	Nuisance dust will be created by the prospecting equipment hauling materials and samples to and from site
	Fauna	Negative High	Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed. Road kills.
	Flora	Negative High	Where new haulage roads will be created the vegetation will be disturbed and/or destroyed.
	Soil	Negative Low	Compaction of soil is expected on the roads that are used by the prospecting operation. Possible hydrocarbon spills from equipment and vehicles.
	Surface Water	Negative Low	If roads are not properly maintained, water erosion after thunderstorms can occur. Possible hydrocarbon spills from equipment and vehicles.
	Visual	Negative Low	The haulage roads will visible to some extent from the immediate surroundings.

Decommissioning	Air quality	Negative Low	Dust emissions from decommissioning activities (including vehicle entrained dust)
	Ground Water	Negative Low	Possible hydrocarbon spills by vehicles and equipment in this area.
	Noise	Negative Low	Noise will be created by the vehicles and equipment in this area.
	Soil	Negative Medium	Soil erosion resulting from the re-spreading of topsoil before vegetation is re-established Ripping of compacted areas
	Surface Water	Negative Low	Possible hydrocarbon spills by vehicles and equipment in this area.
Analysis of Samples	No impact on site		
Consolidation of results	No impact on site		

Table 5: Potential Cumulative Impacts

ASPECT	IMPACTS	DETAILED DESCRIPTION
Climate	Release of greenhouse gas emissions	<ul style="list-style-type: none"> The release of greenhouse gasses and other contaminants to the atmosphere is expected as a result of land-based vehicle activity. The clearing of vegetation negatively affects carbon sequestration efficiency and increase emissions resulting from decomposition. These impacts are regarded as insignificant in terms of contribution. The risks are recognised as a cumulative impact.
Soils	Loss of natural resource (topsoil)	The loss of topsoil as a natural resource as a result of soil contamination and erosion negatively affecting land capability
Hydrology	Surface water pollution	Surface water quality impacts will extend beyond the boundary of the site if not managed appropriately which in turn affects the agricultural sector highly dependent on this surface water resource.
Geohydrology	Groundwater pollution	Groundwater contamination is regarded as a cumulative impact. Regionally there is a high dependency on groundwater resources and all activities which may impact on ground water resources are regarded as significant.
Biodiversity (Flora, Fauna and Avifauna)	Loss of biodiversity and disruption of existing ecosystem functioning	The cumulative impacts relate to land transformation resulting in the loss of habitat from the pitting activities which will affect habitats.
Visual	Visual disturbance and change of landscape character	The cumulative impacts relate to visual disturbance is regarded to impact the regional "sense of place". Regionally the site visual has been affected by mining activities.

5.4.1 Potential impact on heritage resources

Potential heritage impact will only occur once drill sites have been identified and on-site activities commences, and it is therefore recommended that the Heritage Impact Assessment be undertaken prior to these planned activities.

The fact that the prospecting activities will be undertaken in a phased approach will provide the opportunity to the prospecting team to demarcate areas of cultural and/or heritage significance (such as graves). With the early identification of these the impact on these will be avoided. If any resource of heritage significance is encountered during prospecting the South African Heritage Resource Agency should be notified

5.4.2 Potential impacts on communities, individuals or competing land uses in close proximity

The surrounding land uses are mainly mining. There are few people who reside in close proximity to the prospecting site as there are small towns. Table 7 highlights the potential impacts the prospecting activity may have on the surrounding areas

Table 6: Potential Impact on Communities

Aspect	Type of Impact	Impact Description
Air quality	Negative High	The movement of vehicles into the site through gravel roads will generate dust which will affect the local air quality.
Water Quality	Negative Low	The flow of stormwater from the gravel roads into the local surface drainage. The water from the gravel roads would be highly contaminated with sediments and spilled fuels and oils.
Noise	Negative Medium	The drill rig and the drilling tractor would potentially create noise that affects fauna in close proximity. The noise generated would also affect the humans in the close proximity to the site.
Soils	Negative Medium	The movement of the vehicle within the farms would compact the soils rendering the soils unproductive hence prior to decommissioning all roads must be rehabilitated.

5.4.3 Positive Impacts (Advantage)

The application is prompted by the fact that adjacent to the application area there are mining rights in the area and have reviewed the geological information prompting the availability of potential iron ore. While no significant short-term positive impacts are associated with the prospecting activities, in the event that a viable reserve is confirmed, and pending the outcome of a detailed social & environmental impact assessments process, positive socio-economic benefits must be investigated and optimized.

The section below provides a summary of the key management measures associated with the impacts identified in the previous section. The detailed rating and management plan are presented and measures to manage the potential impact on heritage resources

A chance find protocol should be designed and implemented for potential heritage resources where drilling activities are planned. Prior to the establishment of new access roads, heritage induction for all employees and sub-contractors must be undertaken and mitigation and /or management measures for the protection of such resources must be implemented.

Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted and an appropriate Heritage Impact Assessment will be undertaken on the site identified.

Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity

- ❖ Pollution Prevention

Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources utilized by communities, landowners and other stakeholders. These mitigation and management measures are discussed in the following section.

- ❖ Noise due to the undertaking of the site prospecting activities;
 - Directly affected, adjacent landowners and farms in proximity to the site will be informed of the planned dates of the drilling and pitting and a grievance mechanism will be made available.
 - Site activities will be conducted during daytime hours 07h00 – 17h30 to avoid night-time noise disturbances and night time collisions with fauna.
 - Poor access control resulting in impacts on fauna movement, breeding and grazing practices;
 - Access control procedures must be agreed on with farm owners and all staff trained on these procedures,
 - Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime;
 - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
 - The landowner (all private and state landowners) will be notified of unauthorised persons encountered on site
 - If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.

- ❖ Visual Impact
 - Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities sand when needed
 - Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be considered in order to conserve water resources.
 - The portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured.
 - A waste management system will be implemented, and sufficient waste bins will be for onsite. A fine system will be implemented to further prohibit littering and poor housekeeping practices.

5.5 Criteria of Assigning Significance to Potential Impacts

Assessment Criteria Terminology

The assessment of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure.

Table 7: Risk Assessment Terminologies

TERM	DEFINITION
------	------------

Nature of impact	This is an appraisal of the type of effect the activity would have on the affected environmental component. Its description should include what is being affected, and how.
Extent	The physical and spatial size of the impact
Duration	The lifetime of the impact which is measured in the context of the lifetime of the proposed phase
Intensity	This describes how destructive, or benign, the impact is. Does it destroy the impacted environment, alter its functioning, or slightly alter it
Probability	This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time.
significance	Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

Table 8: Criteria Description

CRITERIA	DESCRIPTION			
EXTENT	National (4)	Regional (3)	Local (2)	Site (1)
	The whole of South Africa	Provincial and parts of neighbouring provinces	Within a radius of 2 km of the construction site	Within the construction site
DURATION	Permanent (4)	Long-term (3)	Medium-term (2)	Short-term (1)
	Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	The impact will last for the period of the construction phase, where after it will be entirely negated	The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
INTENSITY	Very High (4)	High (3)	Moderate (2)	Low (1)
	Natural, cultural and social functions and processes are altered to extent that they permanently cease	Natural, cultural and social functions and processes are altered to extent that they temporarily cease	Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected

PROBABILITY OF OCCURRENCE	Definite (4)	Highly Probable (3)	Possible (2)	Improbable (1)
	Impact will certainly occur	Most likely that the impact will occur	The impact may occur	Likelihood of the impact materialising is very low
CRITERIA FOR THE RATING OF CLASSIFIED IMPACTS				
Low impact (3 -10 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.			
Medium (11 -20 points)	Mitigation is possible with additional design and construction inputs.			
High impact (21 -30 points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.			
Very high impact (31 - 48 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.			
Status	Denotes the perceived effect of the impact on the affected area.			
Positive (+)	Beneficial impact.			
Negative (-)	Deleterious or adverse impact.			
Neutral (/)	Impact is neither beneficial nor adverse.			
It is important to note that the status of an impact is assigned based on the status quo – i.e. should the project not proceed. Therefore, not all negative impacts are equally significant.				

5.5.1 Potential Impact of Each Main Activity in Each Phase, and Corresponding Significance Assessment

Table 9: Significance of the Potential Impacts

PROSPECTING POTENTIAL IMPACTS							
E = Extent, D = Duration, I = Intensity, P = Probability of occurrence				Where (E + D + I) X P = Significance			
Phase and Activity	Aspect	Potential Impact	Rating Before Mitigation				Significance before mitigation
			E	I	D	P	
Phase I: Mapping & Surveying	Flora	Loss of Vegetation through clearing of the access tracks	1	2	2	3	15 Negative
Phase II: Drilling & Sampling	Flora	Loss of Vegetation when clearing drilling points	1	3	2	2	12 Negative
	Fauna	<ul style="list-style-type: none"> Loss of habitat during clearing of vegetation Potential roadkill 	1	5	3	3	27 Negative
	Soil	<ul style="list-style-type: none"> Removal of topsoil on the drilling points Soil disturbance from soil sampling Soil compaction resulting from repeated use of access tracks Oil and fuel spills from drilling equipment 	2	3	2	2	14 Negative
	Water	<ul style="list-style-type: none"> Contamination of ground water and reduction of water quantity through spills of hydrocarbons from drill rig Contamination of surface water through the flow of contaminated storm water from site into local water streams 	1	2	2	2	10 Negative
	Air	Generation of dust from gravel access tracks, and drilling points	1	2	1	2	8 Negative
	Noise	Noise emanating from drill rig	1	1	1	2	6 Negative

Phase II: Access Road	Air	Nuisance dust will be created by the prospecting equipment hauling materials and samples to and from site	1	2	1	2	8 Negative
	Fauna	<ul style="list-style-type: none"> Where new haulage roads will be created the natural habitat of the animals will be destroyed Potential road kills 	2	3	2	3	21 Negative
	Flora	Where new haulage roads will be created the vegetation will be disturbed and/or destroyed	1	3	2	2	12 Negative
	Surface Water	<ul style="list-style-type: none"> If roads are not properly maintained, water erosion after thunderstorms can occur. Possible hydrocarbon spills from equipment and vehicles. 	1	2	2	3	15 Negative
	Soil	<ul style="list-style-type: none"> Compaction of soil is expected on the roads that are used by the prospecting operation. Possible hydrocarbon spills from equipment and vehicles. 	1	2	1	2	8 Negative
	Visual	The haulage roads will visible to some extent from the immediate surroundings.	1	2	1	2	8 Negative
Phase III: Decommissioning	Air quality	Dust emissions from decommissioning activities (including vehicle entrained dust)	1	2	1	2	8 Negative
	Noise	Noise will be created by the vehicles and equipment in this area.	1	2	1	2	8 Negative
	Soil	<ul style="list-style-type: none"> Soil erosion resulting from the re-spreading of topsoil before vegetation is re-established Ripping of compacted areas 	1	2	1	2	8 Negative
	Surface Water	Possible hydrocarbon spills by vehicles and equipment in this area.	1	2	1	2	8 Negative

5.5.2 Assessment of Potential Cumulative Impacts

Table 10: Significance of Cumulative Impacts

ASPECT	IMPACTS	Impact rating Before Mitigation				Significance before mitigation
		E	I	D	P	
Climate	<ul style="list-style-type: none"> Release of greenhouse gas emissions is expected as a result of land-based vehicle activity. The clearing of vegetation negatively affects carbon sequestration efficiency and increase emissions resulting from decomposition. These impacts are regarded as insignificant in terms of contribution. The risks are recognised as a cumulative impact. 	1	1	1	2	6 Negative
Soils	The loss of topsoil as a natural resource as a result of soil contamination and erosion negatively affecting land capability	1	2	1	2	8 Negative
Hydrology	Surface water quality impacts will extend beyond the boundary of the site if not managed appropriately which in turn affects the agricultural sector highly dependent on this surface water resource.	2	2	1	2	10 Negative
Geohydrology	Groundwater contamination is regarded as a cumulative impact. Regionally there is a high dependency on groundwater resources and all activities which may impact on ground water resources are regarded as significant.	1	2	1	2	8 Negative
Biodiversity (Flora, Fauna and Avifauna)	Loss of biodiversity and disruption of existing ecosystem functioning – The cumulative impacts relate to land transformation resulting in the loss of habitat	1	2	1	3	12 Negative
Visual	The cumulative impacts relate to visual disturbance is regarded to impact the regional “sense of place”. Regionally the site visual has been affected by mining and prospecting activities.	1	1	1	2	6 Negative

5.6 Proposed Mitigation Measures to Minimise Adverse Impacts

5.6.1 List of Actions, Activities, or Processes that have Sufficiently Significant Impacts to Require Mitigation

Table 11: Activities requiring Impacts Mitigation

ACTIVITY	IMPACT
Drilling and sampling	The drilling activity will create significance impact on the biodiversity, underground and surface water and has the potential to generate noise and dust.

Access Road	The clearing of vegetation for access track road to the drilling site and for hauling samples from the site for analysis in the lab. The movement of vehicles on the haul road would also compact the soils.
Topsoil stockpile	The removed topsoil must be stockpiled for rehabilitation purposes.
Decommissioning and rehabilitation	The decommissioning includes the backfill of the drill sites. The potential impacts of this activity include water contamination and generation of dust.

Table 12: Impact Mitigation

Aspect	Impact	Mitigation Measures
Air quality	creation of nuisance dust	<ul style="list-style-type: none"> • Avoidance of unnecessary removal of vegetation; • Routine spraying of unpaved site areas and roads utilized by the prospecting operation with water; • Speed limits of vehicles inside the application area will be strictly controlled to avoid excessive dust or the excessive deterioration of the roads to be used. • All cleared disturbed or exposed areas to be re-vegetated as soon as practically possible to prevent the formation of additional sources of dust.
Fauna	Loss of Fauna	<ul style="list-style-type: none"> • Speed limits of vehicles inside the application area will be strictly controlled to avoid road kills. • Continuous backfilling and revegetation of open excavations. • No hunting (snares) will be allowed at the application area.
Flora	Loss of Fauna	<ul style="list-style-type: none"> • Concurrent rehabilitation should be implemented and revegetation with indigenous species should be implemented • No trees or shrubs will be felled or damaged for obtaining firewood. • Management will take responsibility to control declared invader or exotic species on the site. The following control methods will be used: <ul style="list-style-type: none"> ➤ "The plants will not be uprooted, felled or cut off and can be destroyed completely." ➤ "The plants will be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • Continuous backfilling of open excavations and spreading of previously stored topsoil over the rehabilitated areas. • All rehabilitated areas, where applicable and possible, will be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to prospecting activities commenced if the natural succession of vegetation is unacceptably slow. • The end objective of the re-vegetation program will be to achieve a stable self-sustaining habitat unit
Groundwater	Contamination of groundwater	<ul style="list-style-type: none"> • Vehicle- and equipment maintenance will only be allowed within the maintenance area. Only emergency breakdowns will be allowed in other areas. • The following procedure will be followed if a vehicle or piece of equipment would break down inside an excavation and outside of the maintenance area: • Drip pans will be placed at all points where diesel, oil or hydraulic fluid may drip and in so doing contaminate the soil.

		<ul style="list-style-type: none"> • All efforts will be made to move the broken-down vehicle or piece of equipment to the maintenance area. • If the vehicle/piece of equipment cannot be moved, the broken part will firstly be drained of all fluid. The part will then be removed and taken to the maintenance area. • Equipment used as part of the proposed operation will be adequately maintained so as to ensure that oil, diesel, grease or hydraulic fluid does not leak during operation. • Fuel and other petrochemicals will be stored in steel receptacles that comply with SANS 10089-1:2003 (SABS 089-1:2003) standards. An adequate bund wall, 150% of volume of the largest storage receptacle, will be provided for fuel and diesel areas to accommodate any spillage or overflow of these substances. The area inside the bund wall will be lined with an impervious lining to prevent infiltration of the fuel into the soil (and ultimately groundwater). The latter will be covered by an approved bacterial hydrocarbon digestion agent that is effective in water.
Noise	Generation of Noise from prospecting equipment and vehicles	<ul style="list-style-type: none"> • Working hours will be kept between sunrise and sunset as far as possible. • The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant area and that which may migrate outside the plant area. • Hearing protection will be available for all employees where attenuation cannot be implemented. • If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.
Soil	Contamination of soil	<ul style="list-style-type: none"> • In all places of development, the first 300mm of loose or weathered material found will be classified as a growth medium. The topsoil will be removed, where possible, from all areas where physical disturbance of the surface will occur. • In all areas where the above growth medium will be impacted on, it will be removed and stockpiled on a dedicated area. The maximum height of stockpiles will be 2 meters • The growth medium/topsoil will be used during the rehabilitation of any impacted areas, after sloping in order to re-establish the same land capability. • If any soil is contaminated during the life of the prospecting period, it will either be treated on site or be removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility or company. • Erosion control in the form of re-vegetation and contouring of slopes will be implemented on disturbed areas in and around the site. • Topsoil will be kept separate from overburden and will not be used for building or maintenance of access roads. • The stored topsoil will be adequately protected from being blown away or being eroded. • Compacted areas will be ripped to a depth of 300mm, where possible, during the continuous rehabilitation, decommissioning and closure phases of the operation in order to establish a growth medium for vegetation. • Vehicle movement will be confined to established roads for as far as practical in order to prevent the compaction of soils.
Surface water	Contamination of surface water	<ul style="list-style-type: none"> • All non-biodegradable (recyclable) refuse such as glass bottles, plastic bags and metal scrap will be stored in a container in the waste area and collected on a regular basis and disposed of at a recognized disposal facility. • Erosion and storm water control measures will be implemented.

		<ul style="list-style-type: none"> • During rehabilitation the applicant will endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.
Topography	Alteration of slopes	<ul style="list-style-type: none"> • All open excavations will be backfilled if and when possible and made safe so as to reflect as far as possible the pre-prospecting topography of the area. • All temporary features, e.g. plant, containers and stockpiling, will be removed and handled in the prescribed manner during rehabilitation.
Visual	Creation of an unpleasing visual look	<ul style="list-style-type: none"> • Open excavations will be subject to progressive backfilling and made safe (including the reestablishment of vegetation). • Waste material of any description will be removed from the prospecting area upon completion of the operation and be disposed of at a recognized landfill facility.

Table 13: Significance of Impact after Mitigation

Phase and Activity	Aspect	Potential Impact	Significance before mitigation	Significance After Mitigation
Phase I: Mapping & Surveying	Flora	Loss of Vegetation through clearing of the access tracks	15 Negative	3 Negative
Phase II: Drilling & Sampling	Flora	Loss of Vegetation when clearing drilling points	12 Negative	6 Negative
	Fauna	<ul style="list-style-type: none"> Loss of habitat during clearing of vegetation Potential roadkill 	21 Negative	10 Negative
	Soil	<ul style="list-style-type: none"> Removal of topsoil on the drilling points Soil disturbance from soil sampling Soil compaction resulting from repeated use of access tracks Oil and fuel spills from drilling equipment 	14 Negative	8 Negative
	Water	<ul style="list-style-type: none"> Contamination of ground water and reduction of water quantity through spills of hydrocarbons from drill rig Contamination of surface water through the flow of contaminated storm water from site into local water streams 	10 Negative	3 Negative
	Air	Generation of dust from gravel access tracks, and drilling points	8 Negative	3 Negative
	Noise	Noise emanating from drill rig	6	3

			Negative	Negative
Phase II: Haul Roads	Air	Nuisance dust will be created by the prospecting equipment hauling materials and samples to and from site	8 Negative	3 Negative
	Fauna	<ul style="list-style-type: none"> Where new haulage roads will be created the natural habitat of the animals will be destroyed Potential road kills 	12 Negative	4 Negative
	Flora	Where new haulage roads will be created the vegetation will be disturbed and/or destroyed	21 Negative	10 Negative
	Surface Water	<ul style="list-style-type: none"> If roads are not properly maintained, water erosion after thunder storms can occur. Possible hydrocarbon spills from equipment and vehicles. 	15 Negative	4 Negative
	Soil	<ul style="list-style-type: none"> Compaction of soil is expected on the roads that are used by the prospecting operation. Possible hydrocarbon spills from equipment and vehicles. 	8 Negative	3 Negative
	Visual	The haulage roads will visible to some extent from the immediate surroundings.	8 Negative	3 Negative
Phase III and IV: Decommissioning	Air quality	Dust emissions from decommissioning activities (including vehicle entrained dust)	8 Negative	3 Negative
	Noise	Noise will be created by the vehicles and equipment in this area.	8 Negative	5 Negative
	Soil	<ul style="list-style-type: none"> Soil erosion resulting from the re-spreading of topsoil before vegetation is re-established Ripping of compacted areas 	8 Negative	3 Negative

	Surface Water	Possible hydrocarbon spills by vehicles and equipment in this area.	8 Negative	4 Negative
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6 ENVIRONMENTAL IMPACT STATEMENT

6.1 Summary of the key findings of the environmental impact assessment

The criteria for the description and assessment of environmental impacts were drawn from the Guidelines for EIA Regulations and in terms of the National Environmental Management Act 1998 which provides guidance for conducting impact assessments.

Activities to be undertaken in proposed development and its respective construction and operational phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into two phases from which impacting activities can be identified, namely:

a) Construction phase:

All the construction related activities on site, until the contractor leaves the site.

b) Operational phase:

All activities, including the operation and maintenance of the proposed prospecting.

The activities arising from each of these phases have been included in the tables. This is to identify activities that require certain environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

6.2 Assessment Criteria

The assessment of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure.

6.2.1 Extent

The physical and spatial scale of the impact is classified as:

a) Footprint

The impacted area extends only as far as the activity, such as footprint occurring within the total site area.

b) Site

The impact could affect the whole, or a significant portion of the site.

c) Regional

The impact could affect the area including the neighbouring properties, the transport routes and the adjoining towns.

d) National

The impact could have an effect that expands throughout the country (South Africa).

e) International

Where the impact has international ramifications that extent beyond the boundaries of South Africa.

6.2.2 Duration

The lifetime of the impact, that is measured in relation to the lifetime of the proposed development.

a) Short term

The impact would either disappear with mitigation or will be mitigated through natural processes in a period shorter than that of the construction phase.

b) Short to Medium term

The impact will be relevant through to the end of the construction phase.

c) Medium term

The impact will last up to the end of the development phases, where after it will be entirely negated.

d) Long term

The impact will continue or last for the entire operational life time of the development but will be mitigated by direct human action or by natural processes thereafter.

e) Permanent

This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient,

6.2.3 Intensity

The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as:

a) Low

The impact alters the affected environment in such a way that the natural processes or functions are not affected.

b) Medium

The affected environment is altered, but functions and processes continue, albeit in a modified way.

c) High

Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

6.2.4 Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length during the life cycle of the activity, and not at any given time. The classes are rated as follows:

a) Impossible

The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0%).

b) Possible

The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.

c) Likely

There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.

d) Highly likely

It is most likely that the impacts will occur at some stage of the prospecting. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.

- e) Definite

The impacts will take place regardless of any provisional plans, and or mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.

6.2.5 Mitigation

The impacts that are generated by the prospecting can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

6.3 Determination of significance – Without Mitigation

Significance is determined through a synthesis of impacts as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

- a) No significance

The impact is not substantial and does not require any mitigation action.

- b) Low

The impact is of little importance but may require limited mitigation.

- c) Medium

The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

- d) High

The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

6.4 Determination of significance – With Mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of

the necessary mitigation measures. Significance with mitigation is rated on the following scale:

a) No significance

The impact will be mitigated to the point where it is regarded as insubstantial.

b) Low

The impact will be mitigated to the point where it is of limited importance.

c) Low to Medium

The impact is of importance however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

d) Medium

Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

e) Medium to High

The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.

f) High

The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

6.5 Assessment weighting

Each aspect within the impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it is necessary to weigh and rank all criteria.

6.6 Ranking, Weighting and Scaling

For each impact under scrutiny, a scale weighting Factor is attached to each respective impact (Refer to Figure 21: Description of biophysical assessment parameters with its respective weighting), The purpose of assigning such weight serve to highlight those aspects considered most critical to the various stakeholders and ensure that each specialist’s element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspects criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Extent	Duration	Intensity	Probability	Weighting Factor (WF)	Significance Rating (SR)	Mitigation Efficiency (ME)	Significance Following Mitigation (SFM)
Footprint 1	Short term 1	Low 1	Probable 1	Low 1	Low 0-19	High 0,2	Low 0-19
Site 2	Short to medium 2		Possible 2	Low to medium 2	Low to medium 20-39	Medium to high 0,4	Low to medium 20-39
Regional 3	Medium term 3	Medium 3	Likely 3	Medium 3	Medium 40-59	Medium 0,6	Medium 40-59
National 4	Long term 4		Highly Likely 4	Medium to high 4	Medium to high 60-79	Low to medium 0,8	Medium to high 60-79
International 5	Permanent 5	High 5	Definite 5	High 5	High 80-100	Low 1,0	High 80-100

Figure 21: Description of biophysical assessment parameters with its respective weighting

6.6.1 Identifying the Potential Impacts Without Mitigation (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

$$\text{Significance Rating (WOM)} = (\text{Extent} + \text{Intensity} + \text{Duration} + \text{Probability}) \times \text{Weighting Factor}$$

6.6.2 Identifying the Potential Impacts With Measures (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

Mitigation Efficiency (ME)

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation effectiveness (ME) rating. The allocation of such a rating is a measure of the efficiency and

effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency

or WM = WOM x ME

Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

The key environmental issues listed in the following section have been determined through:

- Potential Views of Interested and Affected Parties;
- Previous Specialist Studies in the surrounding areas;
- Legislation; and
- Experience of the Environmental Assessment Practitioner (EAP).

6.7 Final Site Map

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

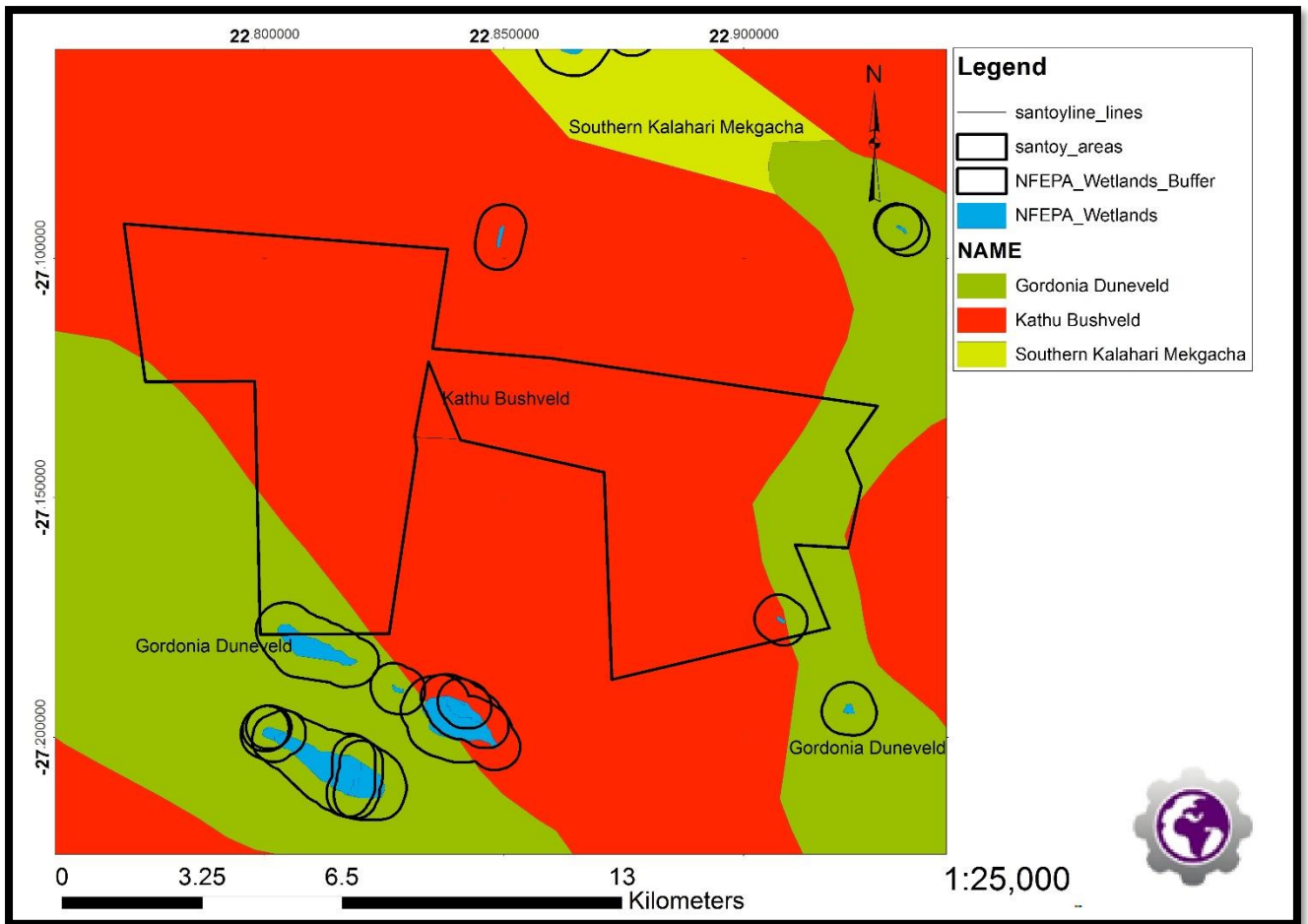


Figure 22: Layout Map

6.8 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Loss of flora and fauna and habitats due to the drilling activities.

Increased ambient noise levels resulting from increased traffic movement during all prospecting phases as well as drilling activities.

Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.

Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.

Increased vehicle activity within the area resulting in the possible destruction and disturbance of fauna and flora.

Poor access control to farms which may impact on animal movement, breeding and grazing practices.

Influx of persons (job seekers) to site because of increased activity and the possible resultant increase in opportunistic crime.

Potential visual impacts caused by drilling activities. Prospecting will be undertaken by specialist sub - contractors and it is not anticipated that employment opportunities for local and / or regional communities will result from the prospecting activities.

Potential impacts per activity and listed activities.

6.8.1 Construction Phase

- Generation of fugitive dust
- Removal of existing vegetation
- Potential negative impact on topsoil seed bank if not stockpiled correctly.

6.8.2 Drilling and sampling

- Loss of flora and fauna including habitats
- Generation of fugitive dust
- Potential hydrocarbon spillage through leaking equipment
- Preparation of vehicle maintenance concrete padding
- Fugitive dust generation
- Spillage of carbonaceous material on roads or other areas

6.8.3 Decommissioning and Closure Phases

- Fugitive dust generation
- Mixing of sub soils with topsoil
- Poor compaction

6.9 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

The objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan prospecting activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance
- Provide a management plan that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures, it is anticipated that the identified social & environmental Impacts can be managed and mitigated effectively. Through the implementation of the mitigation and management measures it is expected that:

- Noise impacts can be managed through consultation and through the restriction of operating hours;
- The pollution of soil and water resources can be effectively managed through containment;
- Ecological impact can be managed through the implementation of pollution prevention measures, minimizing land clearing, restricting working hours (faunal disturbance) and concurrent rehabilitation.
- Risks associated with crime can be mitigated through avoiding recruitment activities on site, as well as monitoring and reporting.

6.9.1 Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

Granting of the prospecting right in conjunction with the environmental authorisation.

6.9.2 Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

As is standard practice, this Basic Assessment Report is based on a number of assumptions and is subject to certain limitations. These are as follows:

- It is assumed that information provided by the applicant and related studies referred to is accurate;

This assessment is based largely on our understanding of the physical and ecological setting based on available literature and based on information that has been gathered in the project area.

The public consultation process will include all invited IAP's from the neighbouring areas, those that responded to the advertisement and the landowner. Comment on all aspects of the process was welcomed during the consultation including comment on the description of the environment. Comments or concerns regarding the description of the environment was raised during public consultation. Notwithstanding the above, Jomela is confident that these assumptions and limitations do not compromise the overall findings of this report.

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

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

"The holder of a permit or authorization remains liable for complying with the relevant provisions of the Act until the Regional Director has issued to him a certificate to the effect that he has complied with the said provisions" The EAP is under the opinion that the applicant has complied with these provisions.

The risks that have been identified can be mitigated. A bank guarantee has provided, indicating that provision has been made for the rehabilitation and removal of species in the proposed area.

6.9.4 Conditions that must be included in the authorisation

- The impacts associated with the invasive elements of prospecting (notably drilling and vehicular access) are likely to be medium to high negative, and of long term to permanent duration, and are not possible to mitigate to any significant degree, and the following suggested mitigation is thus designed to minimise and avoid the impacts. The primary sources of impact will be squashing and breaking of plants by the wheeled vehicles, plus compacting of the soils in these areas, plus actual physical removal of plants.
- As there are few existing tracks in the area the creation of new tracks must be minimized, and creation of the drilling grid must be designed so that turning and reversing of vehicles is minimised.
- Only all-wheel-drive vehicles may be used; this substantially reduces the impact of vehicles on the terrain.
- Prospecting should only be allowed in the dry season, when most of the plants are dormant or below ground, and when the ground is harder and less prone to erosion.
- Any excavated soils not needed for sampling must be replaced within one day of excavation, with topsoil kept aside and replaced last. The top 50cm (500mm) of any hole should be regarded as topsoil.
- Employees and all prospecting contractors must be informed about the importance and sensitivity of the natural vegetation prior to entering the area, and thereafter on an ongoing basis. The following topics should be presented to them: minimizing disturbance, avoidance of disturbance in non-target areas, erosion control, litter management, use of dedicated on site toilets, protection of all fauna and flora.
- Where possible all disturbed and displaced succulents and bulbs (where evident after drilling) should be replanted by hand within the disturbed areas, and the soil compacted by hand around their roots or bulbs.
- Whilst these mitigation measures will lessen the potential negative impacts on the vegetation, they will not entirely mitigate the damage that will be done. Of particular importance is the method of filling holes and replacing topsoil - this must be done concurrently with the drilling process i.e. holes should be filled and rehabilitated almost immediately after sampling is done at each site. It is also imperative that prospecting paths are driven only once. If existing tracks can be used and the number of drill sites and pit sites could be reduced, this would reduce the impacts further. Photographic records of each site pre- and post- drilling should be kept as proof of adequate rehabilitation.

6.9.5 Period for which the Environmental Authorisation is required.

The Prospecting Right has been applied for a period of five years. The Environmental Authorisation must be valid for the term of the prospecting right and until the closure certificate has been received by the applicant.

6.9.6 Undertaking

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

The EAP confirms that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic Assessment report and the Environmental Management Programme report.

6.10 Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

The applicant must make financial provision for the rehabilitation of the environmental has been calculated at **R 137 493**.

6.10.1 Explain how the aforesaid amount was derived.

The financial provision was calculated based on the current master rates in the quantum table noting the area that will be disturbed by the drilling and pitting and vehicle movement.

Refer to section: 1)a)ii)(1) **Determination of the amount of Financial Provision.**

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

It is hereby undertaken that the amount of **R 137 493**, in the form of a bank guarantee for rehabilitation purposes as required in terms the NEMA and MPRDA acts, will be provided to the DMR upon granting of the requested prospecting right.

6.10.3 Specific Information required by the competent Authority

ii) 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.

No specific report was generated for the purposes of the socio –economic conditions. All findings are presented hereafter: The directly and indirectly affected property owners living near the project are likely to be affected by issues relating to noise, dust and vibration from prospecting operations. Directly affected property owners may also be affected

by visual disturbances including night lights and infrastructure. No objections or issues have been raised yet by the directly affected and adjacent landowners.

Mitigation

Tula Coal Group will monitor impacts on affected property owners and their environment and conduct regular dialogue and consultation to identify and manage any adverse impacts. Pro-active monitoring would also assist to determine potential issues before property owners are affected.

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

It should be noted that no graves have been identified yet but consultation with the landowner regarding grave sites and cultural interest on the site will be done prior to drilling, thus activities of will not result on any historical resources being impacted on.

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

Any issues that may arise during the consultation process will be addressed and form part of the final report.

PART B

7 ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

7.1 Draft environmental management programme.

- a) **Details of the EAP**, (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Description of proposed activity has been provided in PART A, of this document

7.2 Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

Description of proposed activity has been provided in PART A, of this document

7.3 Composite Map

The composite map showing rivers or dams are within 32m, 500 for wetlands of the proposed area and biodiversity of ecological sensitivity. Buffer areas should be avoided during the prospecting, should the applicant wish to drill and sample within these buffers the relevant water uses must be applied for with the Department of Water and Sanitation.

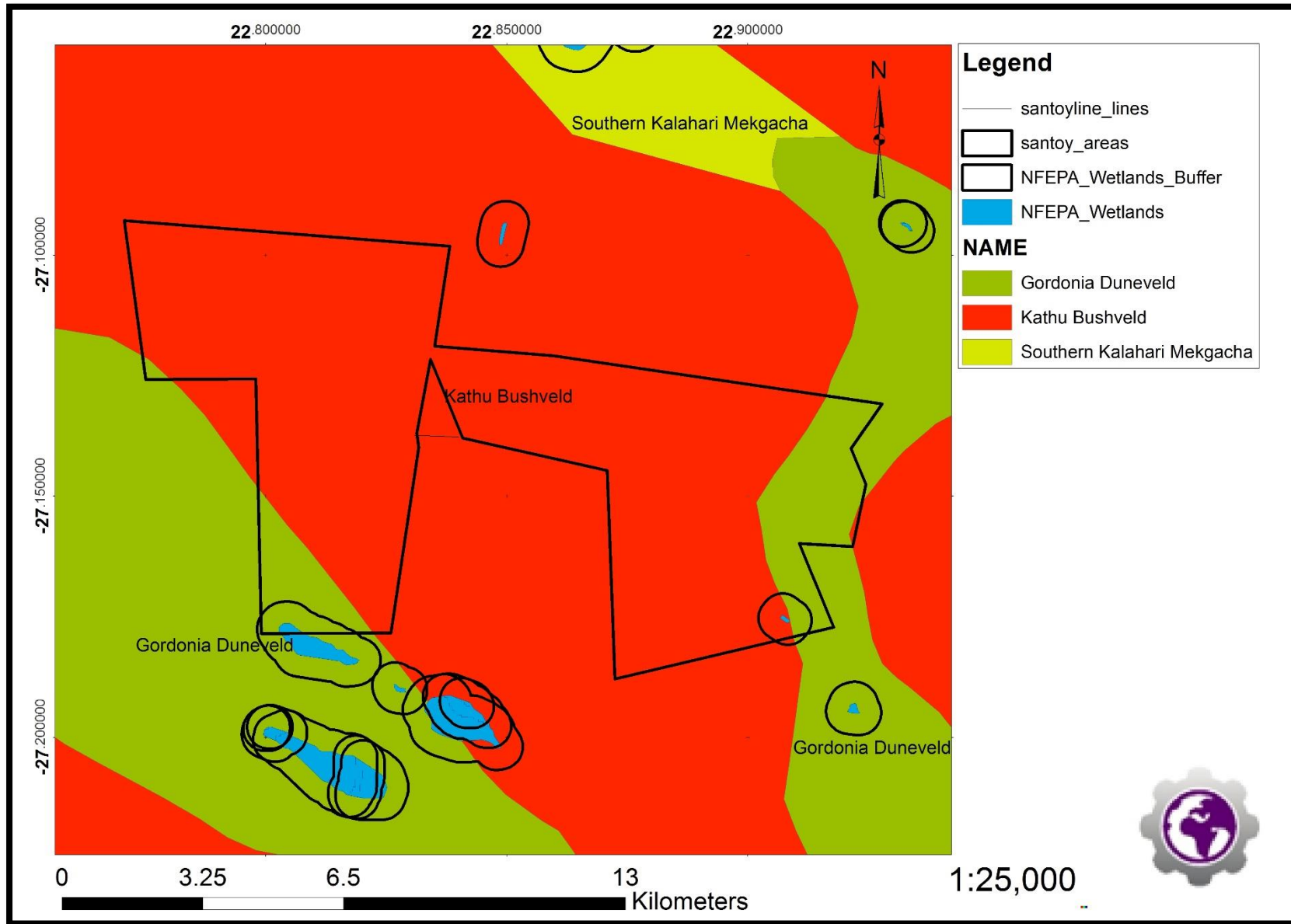


Figure 23: Composite Map

7.4 Description of Impact management objectives including management statements

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

Decommissioning and Closure Phase Activities

In broad terms decommissioning activities associated with the proposed site includes the removal of infrastructure, rehabilitation, preparation of final landforms for closure and prompting vegetation growth in order to reduce the effects of soil erosion and to re-establish landscape functionality.

After decommissioning, closure activities will include maintenance and aftercare that is required to ensure that rehabilitation is successful. In this regard, although closure objectives have not been finalised, one of the options that will be considered is rehabilitation to open veld.

The project plan includes intensive concurrent rehabilitation in conjunction with prospecting activities to ensure a minimum time period is required for final rehabilitation and aftercare once drilling has halted.

The rehabilitation plan has been developed specifically to meet the closure objectives for this project. Concurrent rehabilitation will be undertaken for the drill sites.

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

Tula Coal Group will source water from the local Municipality for drilling and portable use.

ii) **Has a water use licence has been applied for?**

A water use licence is not required for this project however consultation with DWS will be undertaken.

7.5 Impacts to be mitigated in their respective phases

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

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Establishment / construction of camp site	Construction Phase	0.2 ha	Dust suppression •Speed limits • Service equipment regularly	NEMA Air Quality Act Mine Health & Safety Act	Concurrently with the Completion of prospecting activities in an area.
Food preparation	All phases	100 cubic meter space required to Prepares 0.01 ton of food	•Restrict open fires *Maintain firebreaks	Mine Health and Safety Act National Veld and Forest Fires Act MPRDA Reg 65	Concurrently with the completion of prospecting activities in an area.
Maintenance of vehicles	All phases	200 cubic meters	Use oil trays	MPRDA Reg 68 NEMA Waste Act	Concurrently with the completion of prospecting activities in an area.
Disposal of Waste	All phases	200 litre bins	Use waste Receptacles	NEMA Waste Act MPRDA Reg 68	Concurrently with the completion of prospecting activities in an area.
Preparation of vehicle maintenance concrete padding	Operational Phase	0.25 ha	Concurrent rehabilitation	MPRDA Regulations 61 & 62	Concurrently with the completion of prospecting activities in an area.
Drilling	Operational Phase	0.75 ha	Concurrent rehabilitation	Procedures for Managing Significant Impacts Related to Prospecting.	Concurrently with the completion of prospecting activities in an area.
De-establishment and removal of infrastructure/ rehabilitation	Decommissioning and Closure Phases	0.75 ha	Systematic rehabilitation	Procedure for Emergency Preparedness and Response Procedure	Concurrently with the completion of prospecting activities in an area.

7.6 Impact Management Outcomes

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

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATIONTYPE E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Establishment / construction of camp site	Dust, Noise	Loss soil resources	Construction Phase	Dust suppression <ul style="list-style-type: none"> •Speed limits • Service equipment regularly 	NEMA Air Quality Act Mine Health & Safety Act
Food preparation	Air pollution	Loss soil resources	All phases	<ul style="list-style-type: none"> •Restrict open fires *Maintain firebreaks 	Mine Health and Safety Act National Veld and Forest Fires Act MPRDA Reg 65
Maintenance of vehicles	water contamination	Loss soil Resources	All phases	Use oil trays	MPRDA Reg 68 NEMA Waste Act
Disposal of Waste	dust, water contamination	Loss of Fauna and Flora	All phases	Use waste Receptacles	NEMA Waste Act MPRDA Reg 68
Preparation of vehicle maintenance concrete padding	noise, dust	Loss soil resources	Operational Phase	Concurrent rehabilitation	MPRDA Regulations 61 & 62
Drilling	Loss of flora and fauna, habitat, Dust, Noise, water contamination	Dust emissions. loss of flora and fauna, Loss of habitats Impacted drainage patterns	Operational Phase	Concurrent rehabilitation	Procedures for Managing Significant Impacts Related to Prospecting.
De-establishment and removal of infrastructure/rehabilitation	Noise, air pollution	None	Decommission and Closure Phases	Systematic rehabilitation	Procedure for Emergency Preparedness and Response Procedure

7.7 Impact Management Actions

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Establishment / construction of camp site	Dust, Noise	Dust suppression •Speed limits • Service equipment regularly	Construction Phase	NEMA Air Quality Act Mine Health & Safety Act
Food preparation	Air pollution	•Restrict open fires *Maintain firebreaks	All phases	Mine Health and Safety Act National Veld and Forest Fires Act MPRDA Reg 65
Maintenance of vehicles	water contamination	Use oil trays	All phases	MPRDA Reg 68 NEMA Waste Act
Disposal of Waste	Dust, water contamination	Use waste Receptacles	All phases	NEMA Waste Act MPRDA Reg 68
Preparation of vehicle maintenance concrete padding	noise, dust	Concurrent rehabilitation	Operational Phase	MPRDA Regulations 61 & 62
Drilling	Flora and Fauna, soils, Dust, Noise, water contamination	Concurrent rehabilitation	Operational Phase	Procedures for Managing Significant Impacts Related to Prospecting.
De-establishment and removal of infrastructure/rehabilitation	Noise, air pollution	Systematic rehabilitation	Decommission and Closure Phases	Procedure for Emergency Preparedness and Response Procedure

7.8 Financial Provision

(1) Determination of the amount of Financial Provision.

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

The rehabilitation plan has been developed specifically to meet the closure objectives for this project.

Final end land use: - Natural veldt, potentially sheep grazing and aloe farming

Environmental objectives:

- After direct placement of topsoil, the area will be profiled to a free-draining landform.
- The soils will be ripped, treated and re-vegetated using a natural grass / shrub / tree mixture.
- The re-vegetation must use an indigenous seed mix which restores the land to a stable and non-erodible landform.
- The rehabilitated areas will be monitored for declared weeds and invasive plants. This will be controlled and managed as per the normal procedure.
- Grazing of rehabilitated areas will be avoided for the first 3-5 years until the desired nutritional status and vegetation coverage has been achieved.
- With proper rehabilitation and fertilisation techniques, this can be reduced to a minimum to ensure that the rehabilitated area is sustainable and will not degrade further due to erosion.
- Allowance will be made for a maintenance period of one year following rehabilitation.

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

This Basic Assessment Report and Environmental Management Plan will be made available to each registered stakeholder for review and comment. All comments will be captured in the issues and response section and will be included into the final report.

7.10 Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main prospecting activities, including the anticipated prospecting area at the time of closure.

Rehabilitation of Camp Site - upon completion of the entire prospecting phase.

Rehabilitation of drill sites - immediately after drill completion.

Rehabilitation of Access Roads - Once the use of specific roads ceases and upon completion of the prospecting work on site

General surface rehabilitation - concurrent with prospecting activities

8 LEADING CLOSURE OBJECTIVES

8.1 Leading Closure Objectives

8.1.1 Socio Economic

Closure Management Objectives

The retrenchment processes will be followed as per requirements of the applicable legal process.

Specific Performance Criteria

- The rehabilitated prospecting environment shall be made safe and deemed safe;
- Where possible infrastructure will remain for social investment opportunities, this will be decided in conjunction with the Integrated Development Plan (IDP) of the area and the local authorities (i.e. municipality). The soils and land capability will be rehabilitated.
- The location and details of any buried hazards will be clearly defined, and robust markers will be installed and maintained.
- All fences **IF ANY** erected around the prospecting area will be dismantled and either disposed of at a permitted disposal site or sold as scrap (provided these structures will no longer be required by the post-prospecting landowner). Fences erected to cordon-off dangerous excavations will remain in place and will be maintained as required.

Monitoring and Reporting

- Commitments made by Tula Coal Group to I&APs in the issues register will be followed up on a regular basis.
- PPP reports and meeting minutes will be made available to all who attended, and copies kept on site. This will include an issues and response register.
- The stakeholder engagement manager will be responsible for keeping all records and following up on commitments made to affected parties.

Action Required

- Any commitments made to I&APs will be attended to the relevant I&AP satisfaction as agreed upon between the I&APs and Tula Coal Group.

8.1.2 Traffic and Safety

Closure Management Objective

- Ensure that all roads rehabilitated and or left behind is safe in good working condition, ensuring public safety and access to site and monitoring points.

Monitoring and reporting

- The site manager will inspect the roads for degradation and spillages.
- Speed limits will be enforced on site where appropriate and feasible.
- All incidences and issues will be recorded, as will the actions taken to address issues and records of such actions kept on site.

Action required

- Any degradation to roads will be repaired with consultation of the roads department.

8.1.3 Topography and erosion control

Closure Management Objectives

- Former Digital Terrain Measurements (DTM) will be used to establish what contours were present prior to waste dump and these will be used to help shape the area according to the final topographical plan.
- The area will have contours constructed to prevent soil erosion.

Specific Performance Criteria

- Surface water bodies shall not be left in any prospecting voids unless the operations manager demonstrates there will be no significant environmental impact (such as salinization, reduction in water availability, toxicity, algal problems, attraction to pest species or a local safety hazard).
- All slopes which may incur erosion will be profiled in such a way that a preferential down drain can be installed.
- Rehabilitated profiles must ensure free drainage of water and should be contoured to fit in with the catchment dynamics.
- Erosion control measures such as contour banks and cut off berms should be constructed, and soil vegetated in rehabilitated areas. On gentle slopes, water will be encouraged to flow off the rehabilitated surface as surface flow, as quickly as possible without causing erosion.
- Where areas of potential ponding is noted, is to be re-profiled to be free draining thereby minimising the potential for ponding.
- All other slopes will have contour drains installed to prevent erosion at intervals of no more that 5m vertical and have a slope of no steeper that 1:250. These contour drains will have an upslope basin with down slope berms.

- Batter board positions at 50m intervals will be set out with the desired slope; these batter boards are to ensure that rehabilitation is completed to within 10% of the final landform. Grid pegs will be set out using the detailed 10m grid in the final profiling to achieve compliance.
- On achieving the profile to within 10% of the final elevation, the fill areas can be pegged out with stakes and these cut off on the elevation of the final profile. The final fill material will be placed around these until the stakes are covered.
- Erosion control measures such as contour banks and cut off berms should be constructed, and soil vegetated in rehabilitated areas. On gentle slopes, water will be encouraged to flow off the rehabilitated surface as surface flow, as quickly as possible without causing erosion.

Monitoring and Proposed Actions

- During decommissioning, the environmental site manager together with the site manager will monitor construction activities at least weekly.
- After rehabilitation the site will be monitored for any pooling or erosion on site, especially after rainfall. This will be the responsibility of the environmental site manager.
- The area needs to be surveyed every two months to monitor differential settlement.
- The environmental site manager will ensure annual soil assessments be conducted by specialist pedologists after rehabilitation of the site.
- Monthly inspections will be conducted by the environmental site manager for any erosion which must be addressed immediately if observed, and together with the site manager will inspect all pipelines and associated dirty water channels/compartments to ensure no leaks or damage to these.
- All dirty water separation and containment facilities will also be inspected at least weekly (and after each rainfall event), to ensure adequate functioning of all systems to prevent leaks into the environment which will negatively impact on the soils.
- The environmental site manager will ensure monthly inspection of surrounding areas for soil compaction.
- Ensure surface water monitoring and action plans are implemented.
- Rehabilitated sites will be inspected for soil erosion on a monthly basis, together with the visual inspection regards to the vegetation cover abundance.
- The rehabilitated areas must be monitored for the type and depth of soil cover used.
- Monitoring of any ecologically sensitive species should they be observed on site will be done as and when required.
- The site will be monitored for alien invasive species at least every 6 months. This will, however, be dependent on the species of alien invasive species on site.
 - Floral surveys will be conducted on rehabilitated areas on an annual basis, together with the soil quality and depth monitoring.

- All reports will be kept at the prospecting offices. All incidences and issues will be recorded, as will the actions taken to address issues. The environmental site manager will be responsible for inspection of sites and keeping records of all monitoring activities.
- The site manager is responsible for ensuring that all vehicles, remaining on site during the decommission phase, are serviced on a regular basis in terms of the maintenance plans.

Action Required

- Should it be noted that designs are not being followed, construction activities will cease, and corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary.
- Any pooling will be addressed by filling depression and / or grading areas and re-vegetating such sites.
- Any erosion will also be addressed utilising contour berms, gabion structures if necessary or a specialist will be consulted if necessary. Any eroded soils will be lifted and returned to the affected area.
- Any deficiencies will be corrected by placing material in these areas as per the rehabilitation plan.
- Additional material or soil will be brought in if required.
- Where topographical areas are exceeded and create storm water drainage issues, excess material will be removed, and area rehabilitated as per the rehabilitation plan.
 - Any recommendations made by specialist pedologist after annual surveys of rehabilitated areas will be considered for implementation as proposed.
 - Any eroded soil will be lifted and replaced to the area which has been eroded.
 - The area will be rehabilitated as per the rehabilitation plan.
 - Erosion control measures, such as gabion structures, will be considered at areas where erosion is persistent.
 - Records of soil placement and package thickness will be kept on a monthly basis during the prospecting phase.
 - Where the soil depth is compromised the areas will be filled with topsoil.
 - Material will be brought in if necessary.
 - Silt build-up in water management facilities / dams will be cleared and deposited in residue deposits if dirty.
 - Any compacted soils will be ripped or diced and re-vegetated with indigenous flora. Vegetation will then be monitored in these areas.
 - Should any erosion be observed on site, it will be reported to the site manager and environmental site manager. The issue will be addressed, and consideration given to:
 - Increasing vegetative cover in problem areas through manual seeding/planting.
 - Implementing erosion control measures such as contour berms or gabion baskets.
 - Consulting specialists.
 - Should soil depth be inadequate in the rehabilitated areas, then more soil will be brought in and deposited on the site.
 - The area will also be inspected for erosion to determine the reason for soil loss. This will be addressed immediately.

- All recommendations made by the specialists will be implemented where deemed appropriate.
- Manual seeding or planting should vegetative cover be inadequate.
- An alien invasive management program will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised will be used responsibly. Where required DWS will be consulted with regards to the use of certain chemicals.

8.1.4 Surface Water Control

Closure Management Objectives

- Surface water will be managed as per GN704 and all clean water will be diverted around the rehabilitated area.
- All water that falls on the rehabilitated area will be managed in such a way that no erosion will occur through the use of contour drains.
- Potential dirty water will be directed to containment dams or silt dams.
- The filled and rehabilitated area will be shaped to facilitate run-off towards the catchment area.
- There shall be no long-term reduction in the availability of water to meet local environmental values.

Specific Performance Criteria

- Actions shall be taken during rehabilitation to ensure that surface and groundwater hydrological patterns/flows will not be adversely affected by the rehabilitation.
- Surface and groundwater levels and quality will reflect original levels and water chemistry;
- Any water runoff or leaching from overburden dumps and residual infrastructure shall have quality compatible with maintenance of local land and water values. Before rehabilitation commences, clean water diversion drains are to be installed around the area. Once the final re-profiling has been completed and the clean water diversions are constructed on the rehabilitated ground, the decant from these areas should be minimal and the in-pit water will reduce.
- Run-off from un-rehabilitated areas will be directed away from any rehabilitated areas. Runoff from rehabilitated areas will be channelled to sedimentation structures so that eroded soil does not leave the property.
- Where seepage/decant may occur deep cut off trenches will be created to intercept the ground water where it daylight downstream and directed or pumped to the containment dam upslope of the void.
- Natural drainage lines will be followed to reduce loss of water in the natural catchments.

Monitoring and Proposed Actions

- The environmental site manager will ensure that surface water management is adhered to during the closure phase.
- Water management features will be upgraded as necessary if water quality issues arise from these structures.
- The rehabilitated area will be monitored for ponding.

- Any areas where ponding occurs will be filled and reshaped as per the rehabilitation plan to ensure surface water runoff from the area and discourage ponding.

Water Quality Monitoring and Reporting

- Biannual water testing will be implemented
- This monitoring program will include various upstream and downstream monitoring points and various sources on site.
- Database of results will be maintained by the environmental site manager and quarterly and annual reports will be compiled and submitted to the management and will be submitted to DWS.
- All samples will be submitted to an accredited laboratory for analysis.
- The following chemical parameters are recommended for the closure phase analysis:
 - ✓ Total Dissolved Solids;
 - ✓ Electrical Conductivity;
 - ✓ pH level;
 - ✓ Alkalinity;
 - ✓ Carbonates;
 - ✓ Magnesium;
 - ✓ Calcium;
 - ✓ Sodium;
 - ✓ Potassium;
 - ✓ Sulphate;
 - ✓ Chloride;
 - ✓ Fluoride;
 - ✓ Iron;
 - ✓ Manganese;
 - ✓ Aluminium
- Water use and consumption on site must be monitored at various strategic locations on site.

8.1.5 Ecology

Closure Management Objectives

- Areas will be fenced off once seeded to prevent surface disturbance to the site and allow for vegetation to establish and stabilise.

Specific Performance criteria

- Vegetation in rehabilitated areas will have equivalent values as surrounding natural ecosystems.
- The rehabilitated ecosystem will have equivalent functions and resilience as the target ecosystem.
- Soil properties will be appropriate to support the target ecosystem.
- The rehabilitated areas will provide appropriate habitat for fauna
- Fauna utilisation, abundance and diversity appropriate to specified post prospecting land use.

- Berms will be maintained. This will be undertaken by vegetating all berms to ensure that they are stable. The berms will also be inspected to ensure that there are no cracks, which could cause leakage. The berms will only be demolished should the area prove to be free draining with no pollution potential after rehabilitation.

Monitoring and Proposed Actions

- Services of a qualified person will be used to monitor the re-vegetation of the rehabilitated areas,
- Records of the monitoring will be kept on site.
- The environmental site manager will ensure that an alien invasive monitoring, eradication and control programme is established during closure and the area will be inspected at least every 3 months and more frequently in areas where alien species were observed.
- The environmental site manager will be responsible for inspecting and managing any protected flora that may be identified by specialists. Specialists will be consulted regarding relocation of these species if necessary during rehabilitation or closure.
- All incidences and issues during closure will be recorded, as will the actions taken to address issues. These will be filed and kept at the offices.
- Rehabilitation will be visually inspected at least monthly with regards to vegetation cover abundance.
- The rehabilitated area will be inspected monthly for general erosion and vegetative cover.
- Rehabilitated areas will be monitored for soil quality and depth annually.

Action Required

- Should it be noted that designs are not being followed, rehabilitation activities will be amended to ensure corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary.
- The specialist's recommendations from biomonitoring and from annual floral surveys of rehabilitated areas will be implemented as soon as possible.
- Should any erosion be observed on site, it will be reported to the site manager and environmental site manager. The issue will be addressed, and consideration given to:
 - Increasing vegetative cover in problem areas through manual seeding/planting.
 - Implementing erosion control measures such as contour berms or gabion baskets.
 - Consulting specialists.
- Should soil depth be inadequate in the rehabilitated areas, more soil will be brought in and deposited on the site.
- The area will also be inspected for erosion to determine the reason for soil loss.
- All recommendations made by the specialists will be followed.
- Manual seeding or planting should vegetative cover be inadequate.
- An alien invasive management programme will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised must be used responsibly.

- Should it be noted that designs are not being followed, rehabilitation activities will cease, and corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary.

8.1.6 Land use

Closure Management objectives

- To ensure that rehabilitation (physical and chemical) is done to such an extent that land use potential is regained.

Specific Performance Criteria

- Soil samples will be taken from rehabilitated areas annually over the full period of closure to determine soil fertility, depth compaction, acidity and prospecting related pollution. This should be conducted by qualified specialist who will also recommend actions and remedial measures to correct any issues observed on site.
- Only after the levelled areas have been inspected and approved by the Site Manager will topsoil be placed to a depth of 0.5m (where possible the original topsoil types should be placed back into the area where it was found). The topsoil layer must be as even as possible, i.e. it must be smooth, and the depth must remain consistent throughout.
- Once the topsoil has been replaced, vehicle movement will be restricted to prevent compaction of the topsoil. All runoff from freshly topsoiled areas will be channelled to pollution control structures so that eroded soil does not leave the property.
- Rehabilitated areas will be vegetated within the same growing season (before or during the rainy season). A suitable seed bed will be prepared to enhance the penetration and absorption of water, thereby giving the seed the best possible chance to germinate. The seeding depth should be very shallow to provide better germination. For most grass species seeding depth is approximately 5- 15mm.
- Rehabilitated areas will be re-vegetated with local indigenous flora as far as possible.
- Once the seed mixture has been sown the land must be rolled using to ensure consolidation around the seeds and effective moisture retention. Access to seeded areas will be restricted to protect the newly established pasture.

Monitoring and Measurement

- A detailed monitoring and reporting programme will be established and followed.
- Rehabilitated areas will be monitored for vegetation cover and alien invasive encroachment at least monthly by visual means.
- Areas of failed growth will be fertilised if necessary and re-seeded or planted with seedling plugs. All exotic and invasive vegetation should be removed.

8.1.7 Ground water

Closure Management Objective

- A cut-off intercept drain will be constructed to capture any seepage.
- Monitoring will continue to detect and report on changes in round water regime

Groundwater Quality and Quantity Monitoring and Reporting

- Up slope and down slope groundwater monitoring will be conducted on a biannual basis during the closure phase;
- Water management features will be upgraded as necessary if water quality issues arise from these structures.
- The environmental site manager will be responsible for the implementation and maintenance of the groundwater monitoring and results obtained.
- The groundwater quality and levels will be monitored on a biannual basis.
- All monitoring boreholes must be demarcated and protected to prevent damage or tampering.
- All samples will be submitted to an accredited laboratory for analysis.
- The following chemical parameters are recommended for the analysis during the closure phase:

Total Dissolved Solids / Electrical Conductivity;

- ✓ pH level;
 - ✓ Alkalinity;
 - ✓ Carbonates;
 - ✓ Magnesium;
 - ✓ Calcium;
 - ✓ Sodium;
 - ✓ Potassium;
 - ✓ Sulphate;
 - ✓ Chloride;
 - ✓ Fluoride;
 - ✓ Iron;
 - ✓ Nitrate;
 - ✓ Manganese; and
 - ✓ Aluminium
- Water use and water consumption on site will be monitored at various strategic areas on site.

General Monitoring and Reporting

- The environmental site manager and site manager will ensure that the integrity of the lining of all dirty water management facilities is tested at least annually.
- The environmental site manager and site manager will inspect all water management facilities and associated pipelines at least weekly to ensure there are no leaks which would result in loss of water and that they are functioning optimally.

- The groundwater flow dynamics will be calibrated every two years with updated monitoring data. This will assist with management and long-term risk prediction and management.
- The environmental site manager will be responsible for inspection of sites and keeping records of all monitoring activities.
- All incidences and issues will be recorded, as will the actions taken to address issues. These will be kept at the site offices.

Action Required

- Should significant changes in qualities or levels be observed then:
- All high-risk facilities will be inspected to ensure no severe problems occur in these areas which have resulted in poor quality leachate.
- Any issues observed will be reported to the environmental site manager and respective site manager.
- A geo-hydrologist will be consulted with regards to any additional mitigation or management activities which can assist in resolving potential pollution, such as cut-off drains.
- Should substantial decreases in groundwater levels or quality be observed in boreholes utilised by surrounding community then the applicant will need to find solutions in conjunction with affected parties.
- Should spikes be observed in water consumption then these will be investigated immediately, and sources identified.
- All leaks identified will be repaired.

8.1.8 Air Quality and Noise

Closure Management Objectives

Dust suppression should be undertaken at site especially during the dry season and during windy conditions.

Monitoring and proposed actions

- Dust suppression techniques and/or frequency will be altered as necessary should dust levels become excessive and exceed target values during rehabilitation.
- Air quality monitoring and reporting will be conducted according to the GNR 827 –Dust control regulations;
- The environmental site manager will be responsible for managing the air quality database and implementing actions, should target levels and frequencies be exceeded. PM10 and PM2.5 monitoring will be conducted if required as per the air quality act and also fall within the responsibility of the environmental site manager.
- Ambient noise will be monitored bi-annually on the prospecting boundary in at least four compass directions.
- Occupational noise will be monitored monthly as part of Safety, Health and Environment.
- The environmental site manager will be responsible for managing noise level database and implement actions should acceptable noise levels be exceeded.
- The site manager will be responsible for ensuring that all vehicles, including those of contractors, are maintained as per their maintenance plan.

- All incidences and issues will be recorded, as will the actions taken to address issues. These will be kept at the project offices.
- Specialists will be consulted where necessary.

Action required

- Should ambient dust levels exceed recommended standards and frequencies as per the Air Quality Act, then the management plan for dust will be re-evaluated and assessed to improve dust control on site. Actions could include:
 - Use of dust binding agents in areas of high dust generation.
 - Consideration of sprinkler systems in areas of high dust generation.
 - More frequent spraying.
- Should ambient noise levels exceed target levels:
 - Additional noise measurements will be taken at all sensitive receptors beyond the prospecting area boundary in question, initially those nearest to the area and working further away until levels are within acceptable levels.
 - Should levels at sensitive receptors still exceed target levels, and it is due to prospecting activities, then the noise management plan will be re-evaluated to reduce noise at these sensitive receptors to within acceptable limits.
- Additional actions can include:
 - ✓ Utilisation of sound buffers or screens around noise sources.
 - ✓ Enclosing point sources in sound-proof enclosures if possible.
 - ✓ Utilising silencers on equipment.
 - ✓ Considering quieter equipment.

8.2 DOMAIN SPECIFIC CLOSURE CRITERIA

The following is a list of domain specific criteria which can be tested and quantified. These closure criteria include post-closure environmental outcomes which must be linked to the monitoring and measurement schedule and program. Please refer to the financial provision for closure for the cost associated with these domains.

Domain 1 _ Mobile Office and Administration

- Offices will be mobile and temporary hence no demolition will be required
- Roads traversing the site area will be rehabilitated as part of the overall rehabilitation of the prospecting area.
- Any contaminated surface material will be removed and disposed of on the co-disposal dump. Waste material will be removed to specific registered waste sites which handle that specific waste.
- Roads and infrastructure areas will be ripped down to 1m, in order to break up the severe compaction before rehabilitation proceeds. Tillage to 30cm will be needed to break up clods. The area will be contoured and seeded with local, indigenous species as per the recommendation of a specialist. Slopes must be kept as shallow as possible to reduce wind friction. The soils placed on the rehabilitated ground must be slightly compacted and not exceed a slope of 18° to ensure suitable substrate for vegetation and to reduce risk of erosion.

Domain 2 _ Waste and Water Related Infrastructure

- All pollution control structures if any will remain on site during closure to ensure the protection of the surrounding environment. These will only be rehabilitated once water runoff quality is of adequate quality to release into the environment.
- The storm water diversion trench will remain in place after decommissions to reduce run-off over the rehabilitated area and reduce erosion.

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

Due to the nature of the activities, the impacts will be very limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. The areas for prospecting purposes will be the main area experiencing impacts. In this event the activities will be temporary in nature, and a detailed management plan has been provided to address potential impacts associated with these activities. The closure plan will assist to achieve the following objectives:

- management accountability and ownership of closure activity;
- ensure that stakeholders' needs, concerns and aspirations are considered when considering closure;
- comply with relevant or applicable legislative requirements;
- ensure the health, safety and welfare of all humans and animals are safeguarded from hazards resulting from prospecting activities that have been terminated;
- limit or mitigate adverse environmental effects to an extent that it is acceptable by all parties;
- mitigate socio-economic impacts in relation to a area in which an operation is located following decommissioning and subsequent closure as far as reasonably possible; help protect indigenous values;
- provide a reasonable basis on which the financial consequences of closure can be estimated, recognised and managed so that rehabilitation and closure is efficiently and cost effectively;
- avoid or minimise costs and long-term liabilities to the company and to the government and public;
- ensure land is rehabilitated to, as far as is practicable, its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development and;
- Ensure investment decisions include appropriate consideration of closure, including both quantitative and qualitative impacts of closure.

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

Table 14: Financial Rehabilitation

CALCULATION OF THE QUANTUM (REAL RATES)

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	17,4	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	238,71	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	351,79	1	1	0
3	Rehabilitation of access roads	m2	500	42,72	1	1	21360
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414,61	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226,15	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	477,42	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	242984,15	1	1	0
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	166847,44	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	207805,47	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	603565,59	1	1	0
9	Rehabilitation of subsided areas	ha	0	139709,6	1	1	0
10	General surface rehabilitation	ha	0,5	132171,31	1	1	66085,655
11	River diversions	ha	0	132171,31	1	1	0
12	Fencing	m	0	150,77	1	1	0
13	Water management	ha	0	50255,25	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,6	17589,34	1	1	10553,604
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		9799,259
1	Preliminary and General	11759,91108			weighting factor 2		11759,91108
					1		
2	Contingencies				9799,9259		9799,9259
					Subtotal 2		119559,10
					VAT (15%)		17933,86
					Grand Total		137493

8.3.2 Confirm that the financial provision will be provided as determined.

The financial provision will be provided as determined in the form of a bank guarantee for rehabilitation purposes as required in terms of the NEMA and MPRDA acts to the DMR upon granting of the environmental authorisation and prospecting right. The PR will only be executed once the financial provision has been settled.

8.3.3 Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, Including Monitoring of Impact Management Actions, Monitoring and reporting frequency, Responsible persons, Time period for implementing impact management actions, Mechanism for monitoring compliance

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities (For Monitoring Programmes)	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Establishment / construction of camp site	Visual inspection of soil erosion and / or compaction	Dust suppression •Speed limits •Service equipment regularly	Site Manager	Once-off upfront consultation with affected parties. As required as grievances are received. 1. Consultation to be signed off by Environmental Management. 2. All grievances to be signed-off by Environmental Management
Food preparation	Visual inspection of soil erosion and / or compaction	Restrict open fires *Maintain firebreaks	Site Manager	Weekly and after rain events
Maintenance of vehicles	Visual inspection of soil erosion and / or compaction	•Use oil trays	Site Manager	Weekly and after rain events
Disposal of Waste	Visual inspection of soil erosion and / or compaction	Use waste receptacles	Site Manager	Weekly and after rain events
Preparation of vehicle maintenance concrete padding	Visual inspection of soil erosion and / or compaction	Concurrent rehabilitation	Site Manager	Weekly and after rain events
Drilling	Visual inspection of soil erosion and / or Compaction, dust	Concurrent rehabilitation	Site Manager	Weekly during the drilling program (prior and post drilling) 1. Consultation to be signed off by Environmental Management. 2. All grievances to be signed-off by Environmental Management
De-establishment and removal of infrastructure/rehabilitation	Follow up inspections and monitoring of rehabilitation	Systematic rehabilitation	Site Manager	Monthly for a period of 6 months after rehabilitation activities are concluded. 1. Monthly monitoring reports to be signed-off by the Environmental Manager. 2. Corrective action to be confirmed and signed-off by the Environmental Manager. 3. Consolidated monthly monitoring reports (including the corrective action taken) to be submitted to the Department of Mineral Resources. Assessment report for site closure to be submitted to the Department of Mineral Resources for approval.

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

Performance assessments must be undertaken on the EMP every two years by an external auditor. These reports must also include the assessment of the financial provision. The reports should be submitted to the DMR.

8.3.5 Environmental Awareness Plan

An environmental awareness training manual will be developed for the prospecting project.

All employees must be provided with environmental awareness training to inform them of any environmental risks that may result from their work and of the manner in which the risks must be dealt with to avoid pollution or the degradation of the environment.

Employees should be provided with environmental awareness training before prospecting operations start. All new employees should be provided with environmental awareness training. Environmental awareness and training is an important aspect of the implementation of the EMP. The onus is on the different parties involved in the various stages of the life cycle of the project to be environmentally conscious. Hence, it is suggested that all members of the project team are familiar with the findings of the site-specific EA report and the EMP. For instance, the contractor is responsible for the lack of environmental knowledge of his/her crew members. The contractor could forward internal environmental awareness and training procedures to the project manager and environmental officer for comment prior to the commencement of the project. Likewise, the above is applicable to the programming, design, operations and maintenance, and decommissioning teams. Environmental awareness ensures that environmental accidents are minimized, and environmental compliance maximized.

All staff and contractors will be submitted to an annual training / awareness course as to inform the staff of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment.

Section 39 (3) (c) requires that an applicant who prepares an Environmental Management Programme or Environmental Management Plan must “develop an environmental awareness plan describing the manner in which the applicant intends to inform his or her employees of any environmental risks which may result from the work and the manner in which the risks must be dealt with in order to avoid pollution and degradation of the environment”. Environmental Awareness is required not only for management and employees (as described in Section 39 (3) (c) but also for visitors to the site. the following strategies and plans will be put into place for each of the parties.

Visitor Environmental Awareness

Visitor/sub-contractor environmental awareness will be generated through the provision of a signboard describing very briefly the environmental considerations applicable to them. The signboard should contain the following information:

- Statement of the applicant's commitment to environmental principles;
- List of the "rules" to which the visitor must abide. This will include:
 - No littering. Dispose of all waste in the bins provided;
 - No fires;
 - Stay on demarcated roadways and paths only;
 - Kindly report any environmental infringements they may notice;
 - Check your vehicle/equipment for diesel/oil leaks.

Senior and Middle Management Environmental Awareness:

Achieving environmental awareness at upper levels of management is slightly different from the process at the operational level. There is often a fair level of the general value of environmental awareness, but site-specific issues will most often need to be communicated. This will be achieved by:

- Management must make themselves fully familiar with the EMP;
- Ensuring that there is a spare copy of the approved EMP at his/her disposal; management is encouraged to make notes in the document regarding the difficulty / ease of implementing the environmental management measures. These notes should be sent to the consultants to assist in future revisions of the EMP;
- The manager must ensure that the operators perform regular monitoring of their workstations / areas.

During the management's execution of their activities/being at the site, the management must be constantly be aware of and observant of especially the following:

- Dust levels - movement outside of demarcated areas;
- Litter management - general housekeeping;
- Topsoil management - fuel/oil management/leaks/changes;
- Success of operational re-vegetation; and
- Alien vegetation.

Operator / Workforce Environmental Awareness:

Achieving environmental awareness amongst the operators and labour is probably the most important because they are usually present at the place where most environmental transgressions take place or in fact cause them. It is the aim of increased environmental awareness to reduce any such environmental transgressions.

Increasing environmental awareness at these levels can be achieved through the following strategies:

- Induction environmental training must take place prior to any contract period.
- Training: Each and every employee (contractor or not) must go through an environmental training process where at least the following items area covered:
 - The oil/fuel management policy must be explained to the employees. The reason for the policy must also be explained (i.e. to not impact on groundwater, surface water, soil quality etc.);
 - The domestic and industrial waste management policy & method must also form part of the training;
 - The topsoil handling method and the reasons for preserving topsoil (i.e. post prospecting re vegetation, erosion prevention etc.);
 - Alien vegetation management: How to recognize and remove such species;
 - Protection of the natural veld by not driving/manoeuvring or walking through the demarcated protection areas. Reporting that demarcation posts/tape is broken or removed;
 - Emergency management procedures such as dealing with oil spills or fires must also be drilled; and
 - Such training will, in this case, be carried out by the site manager/resident engineer.

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

Environmental awareness training will be provided as well as ongoing awareness through the use of relevant environmental topics included in daily toolbox talks.

Basic Environmental Awareness

Management is responsible to provide training of employees and contractors on:

The importance of conformance with the environmental management plan (EMP).

The significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance.

Their roles and responsibilities in achieving conformance with the EMP, including emergency preparedness and response requirements.

The potential consequences of departure from specified operating procedures.

Comprehension Training

Comprehension training must include:

Emergency preparedness and response

Spill management

Water management

Incident reporting

Storage of chemicals

Each supervisor is responsible to ensure the above are discussed with all employees and contractors, for which attendance must also be recorded. Records must be submitted to management.

Scheduling and conducting of training

After the training needs have been identified, it is the responsibility of Management or appointed representatives to ensure that personnel attend the relevant identified training. Progress on compliance with the training program must be verified during the Management meetings.

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

The role that the Environmental Awareness Plan plays in reducing the risk of pollution or degradation of the environment is best understood in its entirety. Tula Coal Group will implement an environmental management system to assist in the implementing and monitoring of commitments included in this BAR and EMP report.

8.3.8 Specific information required by the Competent Authority

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

- Financial statements will be declared to the competent authority annually
- Any disturbance (including driving and walking) should be prohibited during all times in restricted areas.

8.4 UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&APs;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed;

y. Gutsona

Signature of the environmental assessment practitioner:

Jomela Consulting (Pty) Ltd

Name of company:

24 October 2021

Date:

-END-