mineral resources and energy

Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

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

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

NAME OF APPLICANT: **Alet Maritz Mynbou (PTY) LTD**
TEL NO: **083 312 7485 (Isak Maritz)**
FAX NO: **086 510 7120**
POSTAL ADDRESS: **PO Box 150;**
Dibeng;
8463
PHYSICAL ADDRESS: **15 Eland Street;**
Kathu;
8446

FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/1/2/12986 PR**

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE SCOPING PROCESS

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

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

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

2) Contact Person and Correspondence Address

a) Details of:-

i) Details of the EAP who prepared the report:

Name of the Practitioner:	**ROELIEN OOSTHUIZEN**
Tel No.:	**084 208 9088**
Fax No.:	**086 510 7120**
E-mail address:	roosthuizen950@gmail.com
Physical Address:	**FARM OBERON, KIMBERLEY**
Postal Address:	**P.O. Box 110823,** **Hadisonpark;** **8306**

ii) Appointed by:

Alet Maritz Mynbou (Pty) Ltd

iii) Expertise of the EAP

(b) The qualifications of the EAP

Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)
(with evidence attached as **Appendix 1**)

(2) **Summary of the EAP's past experience**
(In carrying out the Environmental Impact Assessment Procedure)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc.
See attached CV. (with evidence attached as **Appendix 2**)

b) Description of the property

Farm Name:	A PORTION OF THE REMAINING EXTENT OF THE FARM ROSSVILLE NO. 638 KURUMAN DISTRICT, NORTHERN CAPE PROVINCE, REPUBLIC OF SOUTH AFRICA. Title Deed: T678/2012
Application area (Ha)	~37.932555ha (Thirty seven comma nine three two five five five hectares)
Magisterial district:	Kuruman, Northern Cape Province
Distance and direction from nearest town	The property is located 25 km south west of Olifantshoek next to the N14 road to Upington.
21 digit Surveyor General Code for each farm portion	C03700000000063800000

c) Locality map

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

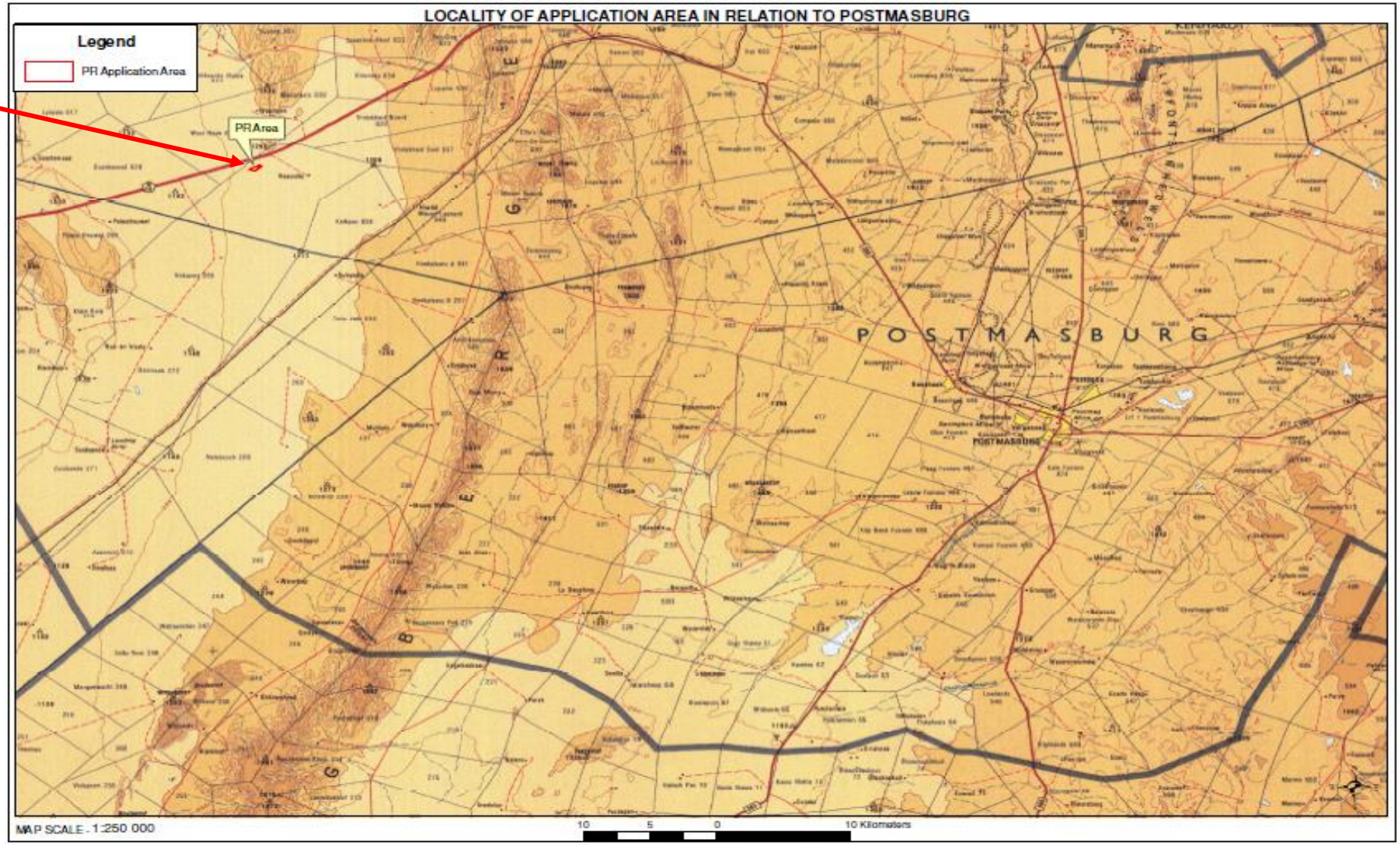


Figure 1. 1:250 000 topocadastral map indicating the application area in RED.

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

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

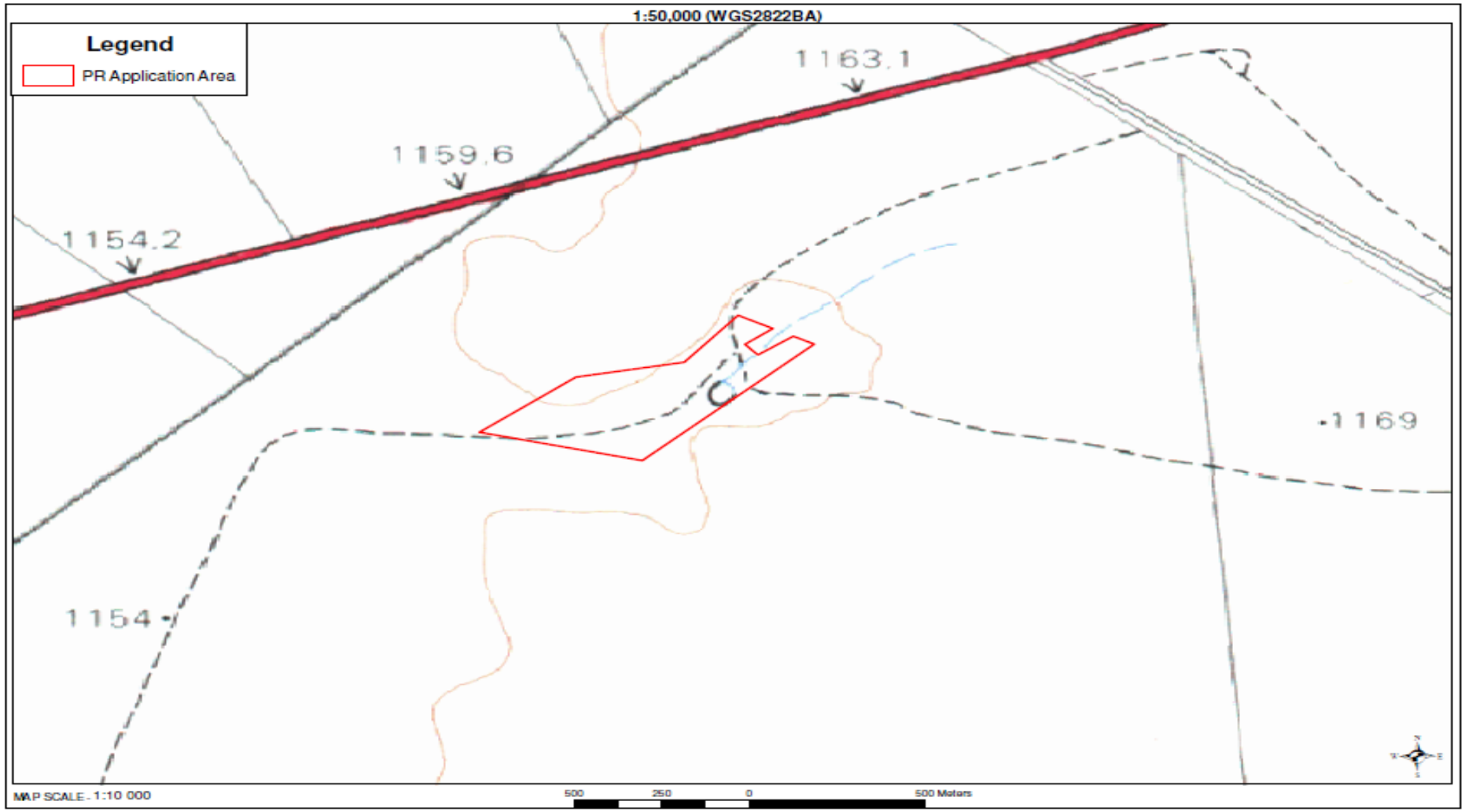


Figure 2. Location, and area (37.932555 ha) of all the aforesaid main and listed activities, and infrastructure to be placed on site.

Table 1. Listed and Specified Activities

Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water distribution Pipelines	X	NEMA: LN1 (GNR327)
Activity 12: "The development of— The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse"** Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.	X	NEMA: LN1 (GNR327)
Activity 20: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including – (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, crushing, screening or washing;	~37.932555Ha Invasive Prospecting Pits 20 pits 2m X 3m X0.5 - 1m 10 trenches 100m X 50m X 0.5 – 1m = 5.012 ha pits that prove to contain kieselgurh (tested positive). It is estimated	X	NEMA: LN1 (GNR327)

But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing notice 2 applies.	that on average 0.5 m of overburden (calcrete and soil) will be removed before accessing the kieselguhr layer (average width 0.5 - 2m).		
Activity 24(ii) of NEMA Listing Notice 1 The development of a road- (i) For which an environmental authorization was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) With a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; But excluding a road- (a) Which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) Where the entire road falls within an urban area; or (c) Which is 1 kilometre or shorter.	±1500m² on the Area.	X	NEMA: LN1 (GNR327)
Activity 27 of NEMA Listing Notice 1 The clearance of an area of 1 hectare or more, but less than 20 ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) The undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	A total of ±5 hectares will be physically disturbed were the kieselgurh material will be removed.	X	NEMA: LN1 (GNR327)
Activity 19 of NEMA Listed Notice 2	~37.932555ha. Although the total area will never be prospected and	X	NEMA: LN2 (GNR325)

The removal and disposal of minerals contemplated in terms of **section 20** of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including- (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing. The Maritz operation directly relates to prospecting of a mineral resource (Kieselgurh) and requires permission in terms of Section 20 (MPRDA), for the removal and disposal of bulk samples of any minerals.	the footprint with the bulk sampling is calculated to be ±5ha.		
Activity 15 of NEMWA Category A The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	0.2ha		NEMWA: Category A (GNR 633)
Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles	± 200 m^2 ± 300 m^2 ± 2 00 m^2 ± 250 m^2 ± 30 m^2 ± 300 m^2 ±300 m^2		Not Listed
Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.	5m x 10m = 50m^2		Not Listed

ii) Description of the activities to be undertaken

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

The initial prospecting activities will be non-invasive and restricted to a desktop study which included a literature survey, plus aerial photograph and satellite image interpretation, and ground validation of targets in the first year. Subsequent phases will be of the invasive-type, typically pitting, or trenching aimed at recovering suitably representative samples to determine grade and quality.

Bulk sample test work will be undertaken to test the grade and quality and ultimately the economic viability of the potential deposit.

A standard phased approach to all prospecting activities will be implemented. Each prospecting activity will be undertaken on a scheduled timeline, with some activities being run concurrently, while others sequentially. Specific milestones will be determined and used as a basis for decisions regarding further activities related to the Prospecting work conducted. The total duration of the prospecting and evaluation activities is planned for five (5) years.

(i) 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)

PHASE 1

Review of Past Exploration Results

In order to direct the exploration programme in an efficient manner, there will be a review of all information and data gathered during previous exploration. A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Imagery Analysis & Geological Mapping

High-resolution satellite images will be studied and used to geologically map the application area.

(ii) DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:

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

PHASE 2

Invasive Prospecting Pits

Invasive Prospecting Pits will be positioned also on a grid of 100m X 100m or 100m X 50 m.

PHASE 3

Bulk Sampling

ACTIVITY		DETAILS		
Number of pits/trenches planned		**20 pits/ 10 trenches**		
	Number of pits/trenches	**Length Depth**	**Breadth**	
	20 pits	2m	3m	0.5 - 5m
	10 trenches	100m	50m	0.5 – 5m
Locality		The location of the trenches will be verified during a site reconnaissance visit and after the pre-feasibility studies has been compiled.		
Volume Overburden (Waste)		Pits (20 X 2 X 3 X 0.5) = 60m³ Trenches (10 X 100 X 50 X ±1) = 50 000m³		
Volume Ore		Pits 360 m³ Trenches 150 000 m³		
Density Overburden		1.8		
Density Ore		0.4		
Phase(s) when bulk sampling will be required		Month 2 – 49 Phase 4		
Timeframe(s)		From time to time during Month 13 - 49		

PHASE 4

Analytical Desktop Study

The project geologist monitors the programme, consolidates and processes the data and amends the programme depending on the results. This is a continuous process throughout the programme and continues even when no prospecting is done on the ground.

Each physical phase of prospecting is followed by desktop studies involving interpretation and modelling of all data gathered. These studies will determine the manner in which the work programme is to proceed in terms of activity, quantity, resources, expenditure and duration.

A GIS based database will be constructed capturing all exploration data.

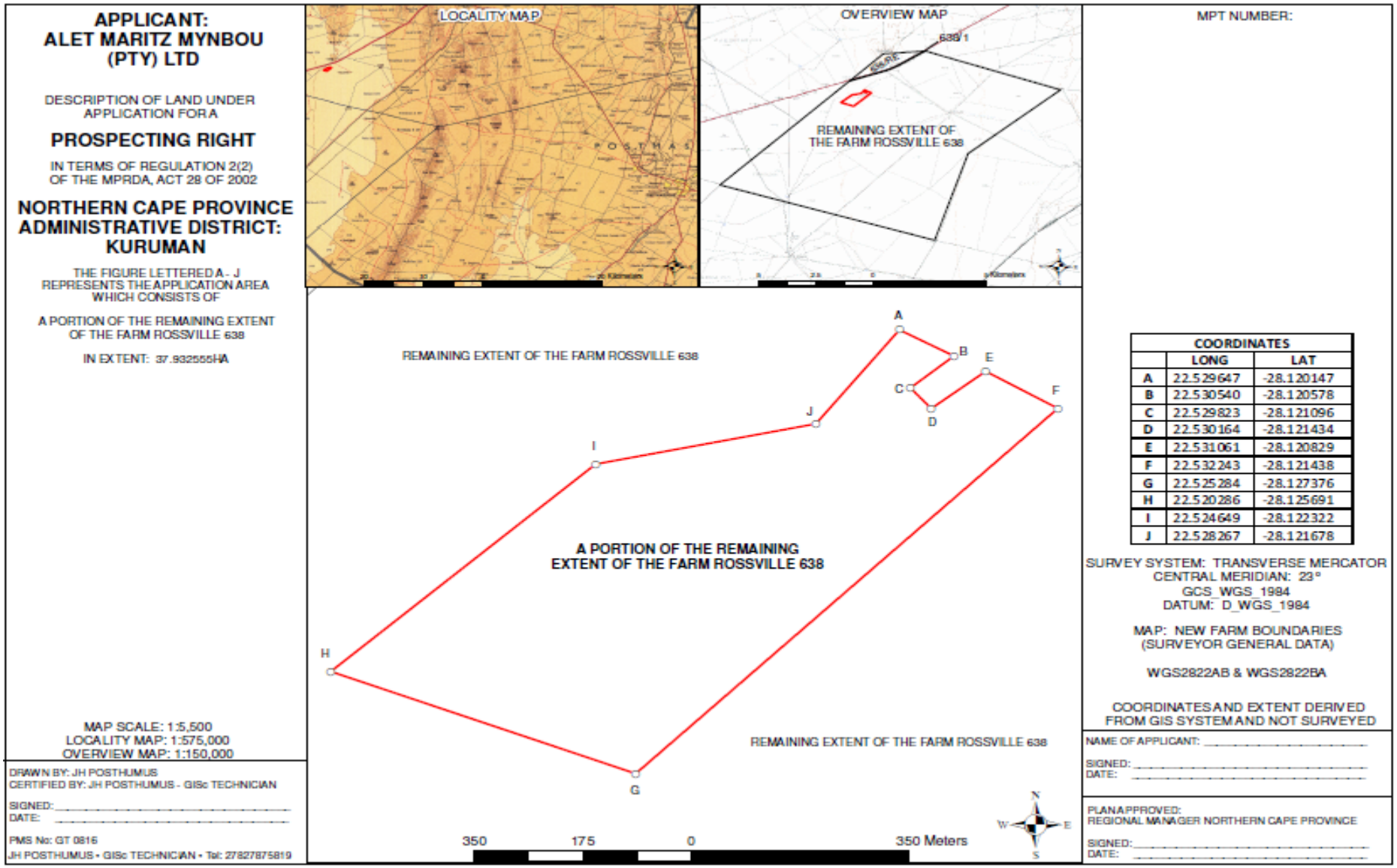


Figure 3. A Portion of the Remaining Extent of the farm Rossville No. 638 (37.932555 ha) in the district of Kuruman.

Waste Management

Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to. Non-biodegradable refuse such as glass bottles, plastic bags, etc. will be sorted and stored in separate lockable containers at a central point. It will be disposed of at a recognised disposal facility regularly. Biodegradable refuse will either be handled as indicated, or be buried in a pit excavated for that purpose and covered with layers of soil when almost full. A final 0,5m thick layer of topsoil will be incorporated where practicable. Provision will be made for the future subsidence of the covering. Refuse will not be dumped in the vicinity of the prospecting area. Waste material with regard to vehicle repairs will be kept in 200 litres steel containers in the maintenance/farmstead area. This material will be disposed of at a recognised disposal facility once a month.

Access Roads

The property is located 25 km south west of Olifantshoek next to the N14 road to Upington. Activities associated with the Mine that is expected to make use of these roads include:-

- The transportation of personnel to and from the site;
- Delivery of supplies and materials;
- The transportation of the product for the market.

These transport operations will make use of passenger vehicles, light delivery vehicles and very limited heavy vehicles.

e) Policy and Legislative Context

Table 2. Applicable legislation and guidelines used to compile the report

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

Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.
Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Prospecting Right has been applied for (NC) 30/5/1/1/2/12986 PR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal) - Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption)	- Control measures are to be implemented upon the approval of the EMPR.

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

	Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List fo Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)	
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa"s natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	- This will be established with a specialist study. It is not anticipated that the prospecting operation fall within any protected area which is known.
National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations)	- To be implemented upon the approval of the EMPR.

	- Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	- A permit application regarding protected tree species need to be lodged with DAFF if necessary. - Control measures are to be implemented upon the approval of the EMPR.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources	- Control measures are to be implemented upon the approval of the EMPR. Fossil finds procedure will be attached to the PIA.

	authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse; (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and;	- A water use application must be submitted and will be submitted as soon as the EIA EMP had been finalized. - Control measures are to be implemented upon the approval of the EMPR.

	- Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))	
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.	- Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- Section 8: General duties of employers to their employees. - Section 9: General duties of employers and self-employed persons to persons other than their employees.	- Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.

Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like; - Agriculture, land survey S10	- To take note.
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR

f) Need and desirability of the proposed activities

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

The major land uses in the region include activities related to agriculture and game farming, and Rossville falls within the North Western Cattle and Game Ranching Rural Livelihood Zone. The land capability for the study area is non-arable, with moderately low potential for grazing and wildlife. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 15 Ha/LSU. Land use on Rossville includes the existing operation of the applicant, which has been ongoing for 30 years. No other land use is practised on the property.

The Olifantshoek area is a very water scarce region and live stock farming are stricklty limited due to the small amount of water that is available in the region.

The area applied for is over a portion of the remaining extend of the Rossville 638 farm, the kieselguhr is a diatomaceous earth which consists mainly of accumulated shells or frustules of intricately structured amorphous hydrous silica secreted by diatoms.

The Diatom exists in many different environments and are abundant in regions of oceanic upwelling :12 000 to 16 000 species of diatoms live in fresh, brackish, or saline waters.

As the Olifantshoek area only have the iron ore and manganese operations the Kieselgurh can also be a source of income and the Kieselguhr prospecting operation in the area would provide an income for the region and jobs for the neaby community.

g) Period for which the environmental authorisation is required

5 years.

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

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

In order to ensure that the proposed development enables sustainable development, a number of feasible options must be explored. Motivation for the footprint of the actual prospecting operation (i.e. excavations) will not be provided here, as the location of the prospecting is determined by the possible geological location of the mineral resource (as discussed in section f).

The initial prospecting activities will be non-invasive and restricted to a desktop study which included a literature survey, plus aerial photograph and satellite image interpretation, and ground validation of targets in the first year. Subsequent phases will be of the invasive-type, typically pitting, or trenching aimed at recovering suitably representative samples to determine grade and quality.

Bulk sample test work will be undertaken to test the grade and quality and ultimately the economic viability of the potential deposit.

A standard phased approach to all prospecting activities will be implemented. Each prospecting activity will be undertaken on a scheduled timeline, with some activities being run concurrently, while others sequentially.

i) Details of the development footprint alternatives considered

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

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

(a) The registered description of the land to which the prospecting right application relates:

A Portion of the Remaining Extent of Rossvile 638, Kuruman

Province: Northern Cape

Title Deed No: T678/2012

Extent : 37.932555 ha

Owner: B & S Maritz Familie Trust (IT73/96)

Alternatives considered:-

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

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

(b) The type of activity to be undertaken:

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed development enables sustainable development, a number of feasible options must be explored. The various alternatives were assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality the prospecting operation do not form part of the discussion as the location of the prospecting operation is determined by the geological location of the mineral resource (as discussed in section f).

Land Use

No specialist comparative land use assessments were conducted, but the prospecting areas has agricultural potential and is used for grazing by the property owners.

It would however be feasible to determine if there is any economically viable minerals to mine as prospecting can also generate income for the property owner that can be used for further development of the property.

The prospectors will have to promote rehabilitation strategies to ensure that open pits and trenches are backfilled.

Project Infrastructure

Alternatives and considerations pertaining to the project infrastructure were discussed in section g.

Prospecting Method

The entire proposed prospecting project at Kuruman will be conducted in four phases as described below over a period of 60 months. This prospecting will consist of non-invasive and invasive (Bulk Sampling) activities. The review of available information that exists over the area of interest will be undertaken by means of conducting a literature review from satellite images and other available information.

PHASE 1

Review of Past Exploration Results

In order to direct the exploration programme in an efficient manner, there will be a review of all information and data gathered during previous exploration. A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Imagery Analysis & Geological Mapping

High-resolution satellite images will be studied and used to geologically map the application area.

PHASE 2
Invasive Prospecting Pits

Invasive Prospecting Pits will be positioned also on a grid of 100m X 100m or 100m X 50 m.

PHASE 3

Bulk Sampling

ACTIVITY		DETAILS		
Number of pits/trenches planned		**20 pits/ 10 trenches**		
	Number of pits/trenches	**Length**	**Breadth**	**Depth**
	20 pits	2m	3m	0.5 - 5m
	10 trenches	100m	50m	0.5 – 5m
Locality		The location of the trenches will be verified during a site reconnaissance visit and after the pre-feasibility studies has been compiled.		
Volume Overburden (Waste)		Pits (20 X 2 X 3 X 0.5) = 60m³ Trenches (10 X 100 X 50 X ±1) = 50 000m³		
Volume Ore		Pits 360 m³ Trenches 150 000 m³		
Density Overburden		1.8		
Density Ore		0.4		
Phase(s) when bulk sampling will be required		Month 2 – 49 Phase 4		
Timeframe(s)		From time to time during Month 13 - 49		

PHASE 4

Analytical Desktop Study

The project geologist monitors the programme, consolidates and processes the data and amends the programme depending on the results. This is a continuous process throughout the programme and continues even when no prospecting is done on the ground.

Each physical phase of prospecting is followed by desktop studies involving interpretation and modelling of all data gathered. These studies will determine the manner in which the work programme is to proceed in terms of activity, quantity, resources, expenditure and duration.

A GIS based database will be constructed capturing all exploration data.

There is no alternative prospecting method for the prospecting of kieselghur.

(c) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating prospecting project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for bulk sampling as well as

limited additional impact on the environmental (non-perrennial drainage lines and wind direction), heritage resources and discussions with the relevant Departments.

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

- Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

- Clean & Dirty water system: Berms
  It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the prospecting site.

- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
  A Diesel Car is the only fuel storage that is taking place on the Application area

- Prospecting Area: Area applied for to pit and trench for kieselguhr (bulk sampling).

- Equipment: One 40-t articulated dump trucks supported by 1 excavator and one front-end loader.

- Roads (both access and haulage road on the prosepcting site):
  Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 1500m² of roads, with a width of 8 meters where no reserve exists and where the reserve exists 15 meters. The current access road is deemed adequate for a service road into the prospecting site.

- Salvage yard (Storage and laydown area).

- Residue stockpile area.

- Waste disposal site
  The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:

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

  - Domestic waste;

  - Industrial waste.

  - Temporary Workshop Facilities and Wash bay.

- Water distribution Pipeline.

- Water tank : It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

Alternatives considered:-

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

The proposed prospecting area is not located near any surface water resources such as rivers or dams and thus the only viable water source will be ground water. However, the proposed site does have an non-perrinial drainage line which may contain water during heavy rainfall events, but this is very unlikely since the site is located in a arid region.

In terms of power generation the options available was for Generators or ESKOM power. All of the electricity needs for the operations will be generated by a diesel generator and there would therefore be no additional pressure on the Eskom Electricity Grid.

In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

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

- Technique

  Invasive Prospecting Pits will be positioned also on a grid of 100m X 100m or 100m X 50 m. The location of the trenches 10 of 100m X 50m X 0.5 – 5m will be verified during a site reconnaissance visit and after the pre-feasibility studies has been compiled. The area will be excavated (opencast method) with an excavator, stockpiled next to the open area and loaded onto trucks by a frond end loader. The trucks will transport the Kieselguhr via an existing road as far as possible.

- Technology

  The Kieselgurh is removed from the site no processing of the product takes place and samples are removed for testing of quality and quantity.

Alternatives considered:-

There is no other feasible, alternative prospecting method for the bulk sampling of kieselguhr.

(e) The operational aspects of the activity:

The topsoil will be removed and the Kieselgurh will be loaded with an excavator on to dump trucks for conveyance to the laboratory.

Prospecting activities will primarily make use of existing roads, but additional roads will most likely be created.

Alternatives considered:-

The conventional opencast load-haul-bulk sampling method has been proven to be the most economic viable method currently being used by the kieselguhr fraternity. There is no other feasible, alternative bulk sampling method for the prospecting and extraction of possible kieselguhr.

(f) The option of not implementing the activity:

Potential land use includes agriculture and game farmg and proposed prospecting. The majority of the area is classified to have potential for agriculture and game farming. Therefore, prospecting activities are believed to be one of the potentially beneficial options for the area to establish any potential for mineral resources.

Land Use

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Alet Maritz Mynbou (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area and to determine the possible impact of prospecting on the diversity and ecological status of the application area. Land Use was described and included in this report as part of the ecological study (Appendix 6 to the report).

The major land uses in the region include activities related to agriculture and game farming, and Rossville falls within the North Western Cattle and Game Ranching Rural Livelihood Zone. The land capability for the study area is non-arable, with moderately low potential for grazing and wildlife. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 15 Ha/LSU. Land use on Rossville includes the existing operation of the applicant, which has been ongoing for 30 years. No other land use is practised on the property.

If the prospecting operation does not continue, the grazing capacity and agriculture will continue. Water will be sourced from underground bore holes in close proximity to the plant and pumped with diesel driven pumps. The propecting operation will not abstract any surface water.

Socio-Economy

The operation will make provision for 5 to 10 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Alet Maritz Mynbou (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area and to determine the possible impact of prospecting on the diversity and ecological status of the application area. Biodiversity was described and included in this report as part of the ecological study (Appendix 6 to the report).

The proposed prospecting site does not fall within a critical biodiversity area, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen 2016).

This map identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. The entire site is classified as a Transformed Area.

Similarly, the Mining and Biodiversity Guidelines (DENC et al. 2013) does not classify any section on Rossville to have biodiversity importance, and therefore does not constitute a risk for mining. These guidelines were developed to identify and categorize biodiversity priority areas sensitive to the impacts of mining to support mainstreaming of biodiversity issues in decision making in the mining sector.

Furthermore, none of the habitats in the study area have been identified as threatened ecosystems, but the Gordonia Plains Shrubland has been classified to have Medium Conservation Priority within the Z F Mgcawu District Municipality.The area lies in the Savana Biome (Eastern Kalahari Bushveld) in the Gordonia Plains Shrubland (SVk 16) as described by Mucina and Rutherford (2006).

The implementation of the prospecting operation will have a potential impact on the biodiversity through removal of indigenous vegetation and destruction of habitats. If no prospecting activities were to continue, the status quo would apply and no damage would accrue to the environment.

Heritage and Cultural Resources

Dr E. Matenga conducted and Heritage Impact Assessment per request of Alet Maritz Mynbou (Pty) Ltd. During the site inspection conducted on 5 July 2021 no relics or artefacts were found an no burial grounds were reported. However, a thick grass cover impaired ground visibility. Furthermore, over a long period of time discarded artefacts and manufacturing waste were likely to have been buried by windblown sand (Appendix 4).

The Desktop Palaeotological Impact Assessment Report was compiled by Prof. M. Bamford. The site for prospecting lies on the ancient and non-fossiliferous strata of the Olifantshoek Supergroup, and the Quaternary aeolian sands that are potentially fossiliferous. Fossils could be found in palaeo-spring and palaeo-pan sites but none is visible from the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr (Appendix 5).

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

ii) Details of the Public Participation Process Followed

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

The consultation process with interested and affected parties (neighbouring farmers and land owners) was completed for the Scoping Report that was submitted and consisted of the process below.

The process as described by NEMA for Environmental Authorisation was followed. See table in Appendix 3 for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted.

An Advert (Notice) will placed in the Kathu Gazette on 5 February 2022 to notify all other interested and affected parties.

The Scoping Report was put on disc and was distributed to all the registered parties per registered mail on 7 February 2022.

The document will also be made available at the public library in Olifantshoek.

Site Notices were also placed on the gates at the entrance of the proposed prospecting site. Furthermore, a site notice was placed at the library located in Olifantshoek.

A summary and proof of all the Public Participation conducted with regards to the application can be found in **Appendix 3.**

Photo 1. Notices at Olifantshoek Library.

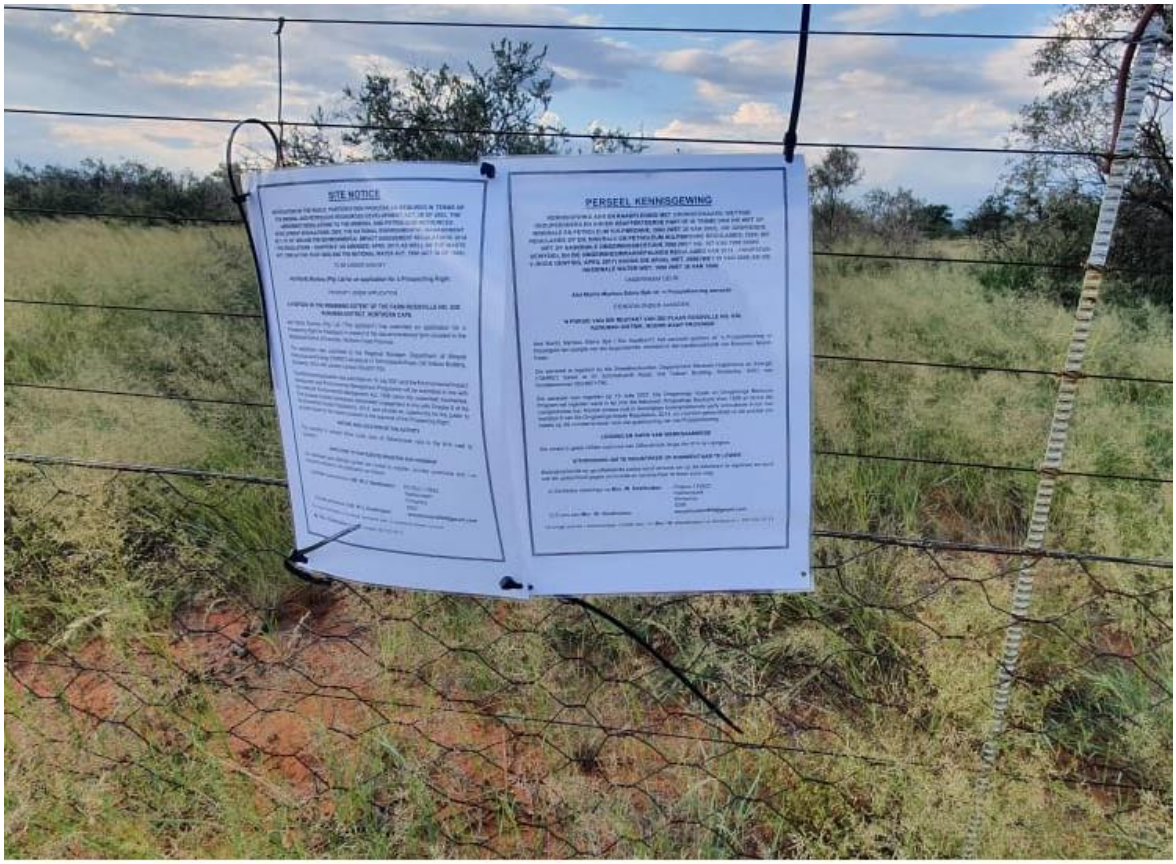
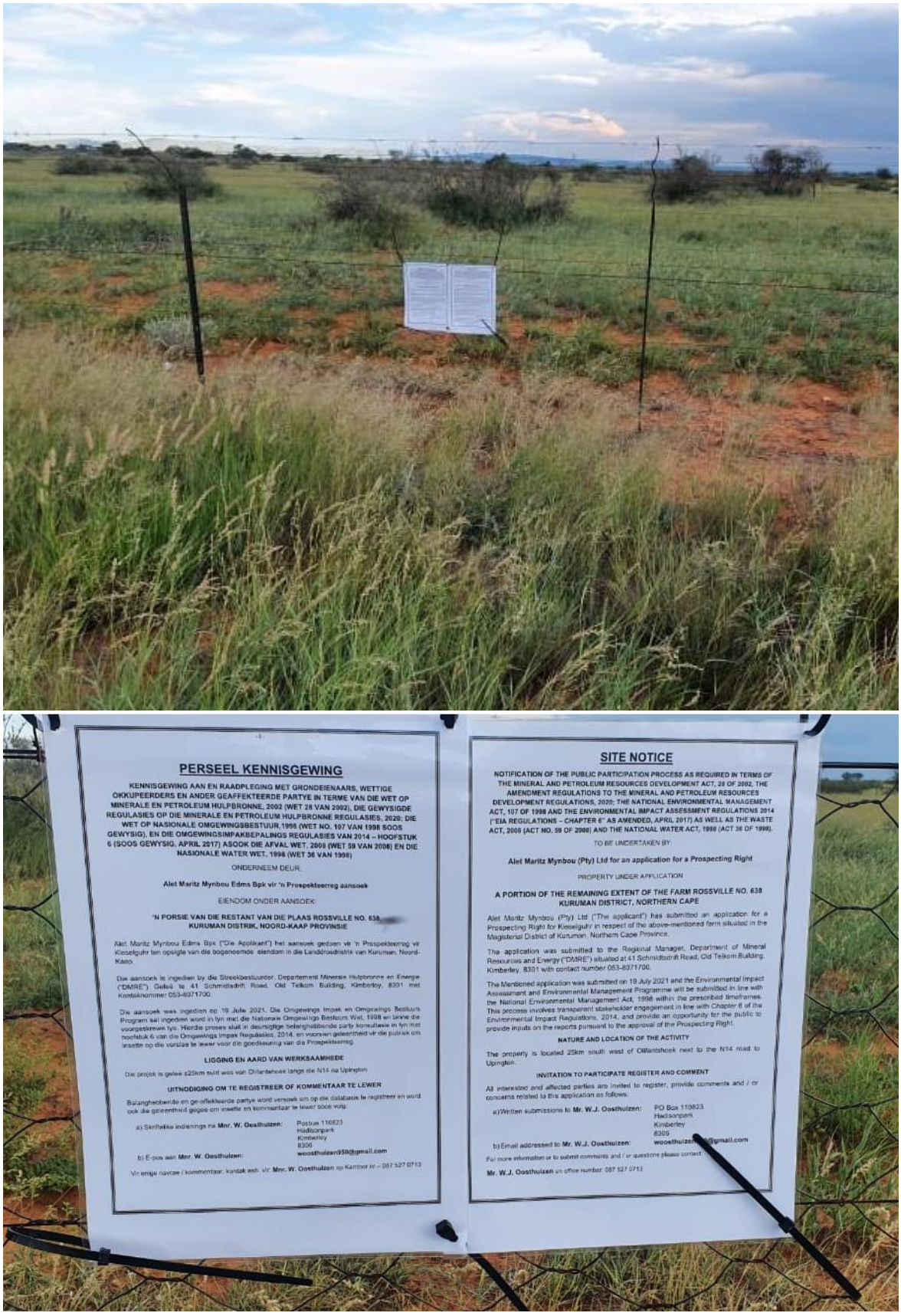


Photo 2. Notice at the entrance of the proposed site.



PERSEEL KENNISGEWING

KENNISGEWING AAN EN RAADPLEGING MET GRONDEIENAARS, WETTIGE OKKUPEERDERS EN ANDER GEAFFEKTEERDE PARTYE IN TERME VAN DIE WET OP MINERALE EN PETROLEUM HULPBRONNE, 2002 (WET 28 VAN 2002), DIE GEWYSIGDE REGULASIES OP DIE MINERALE EN PETROLEUM HULPBRONNE REGULASIES, 2020; DIE WET OP NASIONALE OMGEWINGSBESTUUR,1998 (WET NO. 107 VAN 1998 SOOS GEWYSIG), EN DIE OMGEWINGSIMPAKBEPALINGS REGULASIES VAN 2014 – HOOFSTUK 6 (SOOS GEWYSIG, APRIL 2017) ASOOK DIE AFVAL WET, 2008 (WET 59 VAN 2008) EN DIE NASIONALE WATER WET, 1998 (WET 36 VAN 1998)

ONDERNEEM DEUR:

Alet Maritz Mynbou Edms Bpk vir 'n Prospekteerreg aansoek

EIENDOM ONDER AANSOEK:

'N PORSIE VAN DIE RESTANT VAN DIE PLAAS ROSSVILLE NO. 638
KURUMAN DISTRIK, NOORD-KAAP PROVINSIE

Alet Maritz Mynbou Edms Bpk ("Die Apolikant") het aansoek gedoen vir 'n Prospekteerreg vir Kieselguhr ten opsigte van die bogenoemde eiendom in die Landdrosdistrik van Kuruman, Noord-Kaap.

Die aansoek is ingedien by die Streekbestuurder, Departement Minerale Hulpbronne en Energie ("DMRE") Gelee te 41 Schmidtsdrift Road, Old Telkom Building, Kimberley, 8301 met Kontaknommer 053-8371700.

Die aansoek was ingedien op 19 Julie 2021. Die Omgewings Impak en Omgewings Bestuurs Program sal ingedien word in lyn met die Nasionale Omgewings Bestuurs Wet, 1998 en binne die voorgeskrewe tyd. Hierdie proses sluit in deursigtige belanghebbende party konsultasie in lyn met hoofstuk 6 van die Omgewings Impak Regulasies, 2014, en voorsien geleentheid vir die publiek om insette op die verslae te lewer voor die goedkeuring van die Prospekteerreg.

LIGGING EN AARD VAN WERKSAAMHEDE

Die projek is gelee ±25km suid wes van Olifantshoek langs die N14 na Upington.

UITNODIGING OM TE REGISTREER OF KOMMENTAAR TE LEWER

Belanghebbende en geaffekteerde partye word versoek om op die databasis te registreer en word ook die geleentheid gegee om insette en kommentaar te lewer soos volg:

a) Skriftelike indienings na Mnr. W. Oosthuizen: Posbus 110823, Hadisonpark, Kimberley, 8306

b) E-pos aan Mnr. W. Oosthuizen: wooosthuizen950@gmail.com

Vir enige navrae / kommentaar, kontak asb. vir Mnr. W. Oosthuizen op Kantoor nr – 087 527 0713

SITE NOTICE

NOTIFICATION OF THE PUBLIC PARTICIPATION PROCESS AS REQUIRED IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 28 OF 2002, THE AMENDMENT REGULATIONS TO THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT REGULATIONS, 2020; THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 107 OF 1998 AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS 2014 ("EIA REGULATIONS – CHAPTER 6" AS AMENDED, APRIL 2017) AS WELL AS THE WASTE ACT, 2008 (ACT NO. 59 OF 2008) AND THE NATIONAL WATER ACT, 1998 (ACT 36 OF 1998).

TO BE UNDERTAKEN BY:

Alet Maritz Mynbou (Pty) Ltd for an application for a Prospecting Right

PROPERTY UNDER APPLICATION

A PORTION OF THE REMAINING EXTENT OF THE FARM ROSSVILLE NO. 638
KURUMAN DISTRICT, NORTHERN CAPE

Alet Maritz Mynbou (Pty) Ltd ("The applicant") has submitted an application for a Prospecting Right for Kieselguhr in respect of the above-mentioned farm situated in the Magisterial District of Kuruman, Northern Cape Province.

The application was submitted to the Regional Manager, Department of Mineral Resources and Energy ("DMRE") situated at 41 Schmidtsdrift Road, Old Telkom Building, Kimberley, 8301 with contact number 053-8371700.

The Mentioned application was submitted on 19 July 2021 and the Environmental Impact Assessment and Environmental Management Programme will be submitted in line with the National Environmental Management Act, 1998 within the prescribed timeframes. This process involves transparent stakeholder engagement in line with Chapter 6 of the Environmental Impact Regulations, 2014, and provide an opportunity for the public to provide inputs on the reports pursuant to the approval of the Prospecting Right.

NATURE AND LOCATION OF THE ACTIVITY

The property is located 25km south west of Olifantshoek next to the N14 road to Upington.

INVITATION TO PARTICIPATE REGISTER AND COMMENT

All interested and affected parties are invited to register, provide comments and / or concerns related to this application as follows:

a) Written submissions to Mr. W.J. Oosthuizen: PO Box 110823, Hadisonpark, Kimberley, 8306

b) Email addressed to Mr. W.J. Oosthuizen: wooosthuizen950@gmail.com

For more information or to submit comments and / or questions please contact:

Mr. W.J. Oosthuizen on office number: 087 527 0713

Photo 3. Notice at the opposite side of the road of the entrance to the prospecting area.

iv) The Environmental attributes associated with the development footprint alternatives (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity

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

(1) *GEOLOGY:*

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Alet Maritz Mynbou (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area and to determine the possible impact of prospecting on the diversity and ecological status of the application area. Geology was described and included in this report as part of the ecological study (Appendix 6 to the report).

The prospecting operation is based on kieselguhr deposits associated with the Kalahari Basin. These are diatomaceous earth composed mainly of the fossilised skeletons of diatoms and spicules of sponges and grass skeletons found below the unconsolidated sands of
the Gordonia Formation.

According to Hornsveld (1977) the geological features on Rossville comprise Tertiary to Quaternary deposits, with red to flesh-coloured wind-blown sand covering the entire property. The kieselguhr deposits on Rossville underlie these sands and have not been formally mapped.

Figure 4. The distribution of geological features in the study area.

A Palaeontological Impact Assessment was requested for the project. In order to comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed application by Prof. M. Bamford. The information below was gathered from the PIA Report.

The farm lies on the Proterozoic (ca 1900 million years old) Olifantshoek Supergroup in the Griqualand West region. Much of the area is overlain by the considerably younger Kalahari Group sediments that are of Quaternary age (Figure 5).

The Olifantshoek Supergroup is essentially arenaceous and form a prominent north-trending mountain range (Moen, 2006). It is composed of interbedded shale, quartzite and basic lava that is overlain by a thick succession of coarse red and grey quartzite and minor shale (Moen, 2006). These strata represent a terrigenous succession that was deposited as a fluvial clastic wedge that extended along the western edge of the Kaapvaal Craton (ibid). The Volop Group consists of two upward-fining sequences, the basal Matsap Group and upper Brulsand Group.

Based on the early works of Leicester King, Partridge and Maud (1987, 2000) developed a model of three African Erosion Surfaces for southern Africa, from the Cretaceous to the Pliocene. During the Cretaceous Africa was very high, averaging about 2500-2000m above sealevel but the rifting apart of Gondwanaland and formation of the Atlantic and Indian Oceans, coastal erosion was rapid and the escarpment rapidly receded about 120km inland along the east and south coasts, but only 50km along the west coast. The newly exposed surface was called the African Erosion Surface. Their model has been challenged and modified by a number of researchers (Burke, 2011; Braun et al., 2014) who propose that mantle plumes caused uplift of the continent during the late Cretaceous, followed by erosion and further uplift about 30-20 million years ago, The newer interpretations have been followed here.

Haddon and McCarthy (2005) proposed that the Kalahari basin formed as a response to down-warp of the interior of the southern Africa, probably in the Late Cretaceous. This, along with possible uplift along epeirogenic axes, back-tilted rivers into the newly formed Kalahari basin and deposition of the Kalahari Group sediments began. Sediments included basal gravels in river channels, sand and finer sediments. A period of relative tectonic stability during the mid-Miocene saw the silcretisation and calcretisation of older Kalahari Group lithologies, and

this was followed in the Late Miocene by relatively minor uplift of the eastern side of southern Africa and along certain epeirogenic axes in the interior. More uplift during the Pliocene caused erosion of the sand that was then reworked and redeposited by aeolian processes during drier periods, resulting in the extensive dune fields that are preserved today.

The oldest dated sands are from the northwest of Kuruman at Mamatwan, ca 60 – 58 ka (Thomas and Shaw, 2003; Haddon and McCarthy, 2005). Dates from sands farther to the west and northwest, showed that in much of the southern dune field two significant phases of linear dune development occurred, between about 30 and 23 ka and 17 and 8 ka ago (ibid). OSL dates on minor dune forms within the linear dune field reveal that Holocene dune building activity possibly occurred at 6 and 2–1 ka. Some of these old surfaces have been stabilised by the formation of calcretes, silcretes and duricrusts that formed by chemical action in wet to dry to wet cycles. The "Tertiary limestones" are a catchall phrase for these deposits

There are numerous pans in the Kalahari, generally 3–4 km in diameter (Haddon and McCarthy, 2005). According to Goudie and Wells (1995) there are two conditions required for the formation of pans. Firstly, the fluvial processes must not be integrated, and second, there must be no accumulation of aeolian material that would fill the irregularities or depressions in the land surface. Favoured materials or substrates for the formation of pans in South Africa are Dwyka and Ecca shales and sandstones (ibid).

Most pans in the Kalahari Basin are filled by a layer of clayey sand or calcareous clays and are flanked by lunette dunes formed as a result of deflation of the pan floor during arid periods (Lancaster, 1978a, b; Haddon and McCarthy, 2005). At some localities in the south western Kalahari spring-fed tufas have formed at the margins of pans during periods where groundwater discharge was high (Lancaster, 1986). These tufas may contain evidence of algal mats and stromatolites and may also be associated with calcified reed and root tubes (Lancaster, 1986).Many of the pans are characterised by diatomaceous earth, diatomite or kieselguhr, a white or grey, porous, light-weight, fine-grained sediment composed mainly of the fossilised skeletons of diatoms. Associated with some palaeo-pans and palaeo-springs are fossil bones, root casts, pollen and archaeological artefacts. Well-known sites are Florisbad and Deelpan in the Free State, Wonderkrater in Limpopo and Bosluispan in the Northern Cape. In in this region under study is the Kathu Complex.

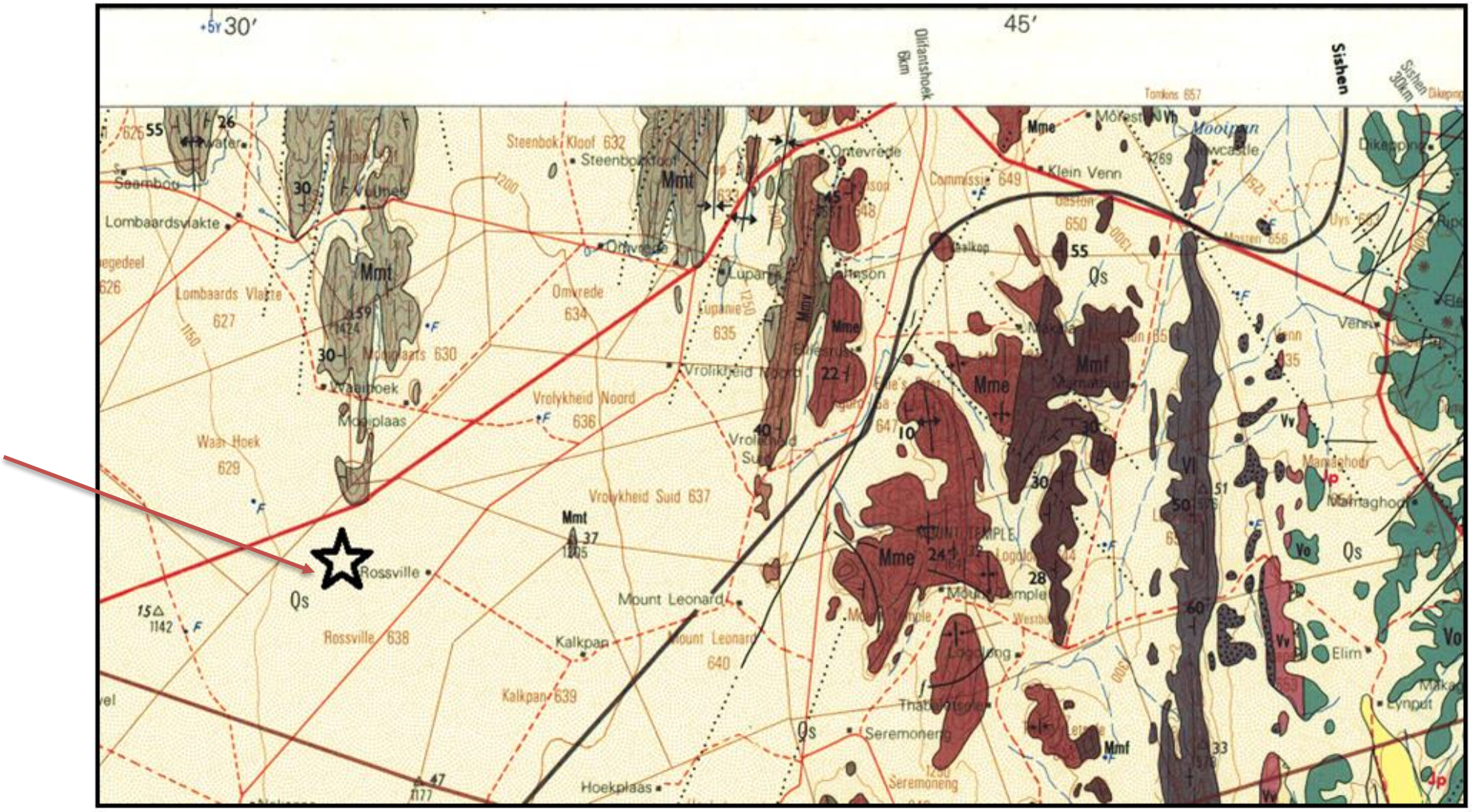


Figure 5. ***Geological map (Council for Geoscience, Pretoria) showing location of the farms. Pink shading (J) - dolerite dykes and sills; Grey shading (c-Pd) - tillites (Dwyka group of Karoo Supergroup); Green shading (Ra) – lavas; Light yellow shading (Qc) – calcrete; Brown shading (Qs) - Red to flesh-coloured wind blown sand; sand dune ; Pale yellow (Qs) - Quaternary to Recent sands and sandy soil of the Gordonia Formation (Kalahari Group).***

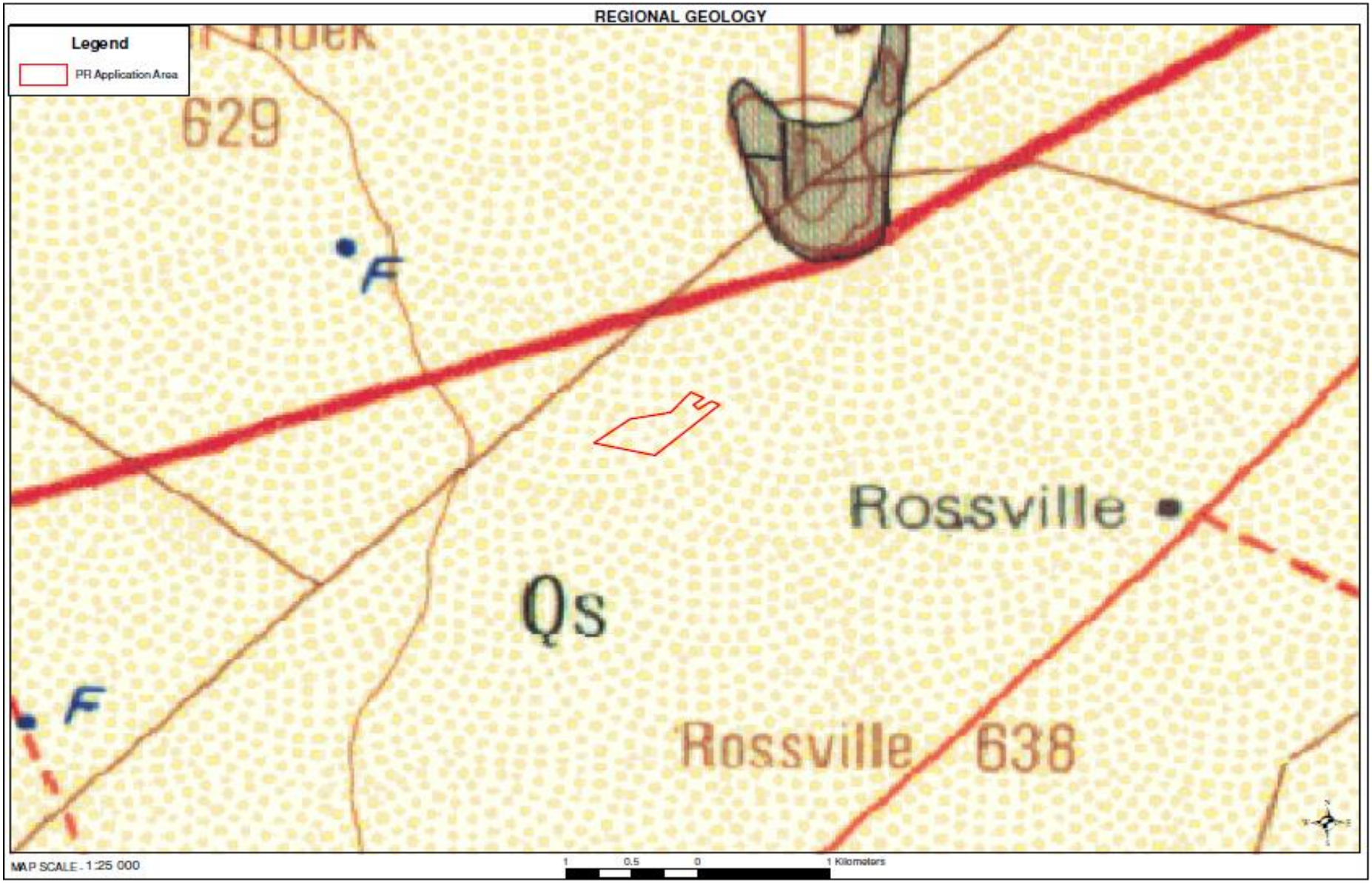


Figure 6. Regional geology of the study area (1:25 000 Scale).

(2) CLIMATE:

Regional Climate

The Olifantshoek/Kathu area is characterised by an arid summer rainfall climate with an average annual temperature of 18.6°C and an average rainfall of 395mm falling predominantly in late summer (highest in March: 74mm). The driest month is July with only 3mm of precipitation. With an average temperature of 25.3°C, January is the warmest month, whilst July is the coldest month with an average of 10.8°C (https://en.climate-data.org/africa/south-africa/northern-cape/kathu-27075/).

(3) *TOPOGRAPHY:*

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The topography of study area is characterised by level plains with some relief. Altitude ranges between 1 150 and 1 160 m above sea level, with the terrain being indicated by a very gentle slope of < 2 % across the site.

(4) *SOILS:*

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Rossville is associated with terrain unit 4 of the Ah1 land type (Figure 7). Here, red-yellow apedal freely drained soils (red to flesh-coloured and white wind-blown sand) with high base status and usually < 15% clay, is present.

The generally level land of the study area produces low water erosion risk, but because the soils primarily consist of shifting sands, the wind erosion risk is increased significantly. If badly eroded, the soils have a low potential to regenerate.

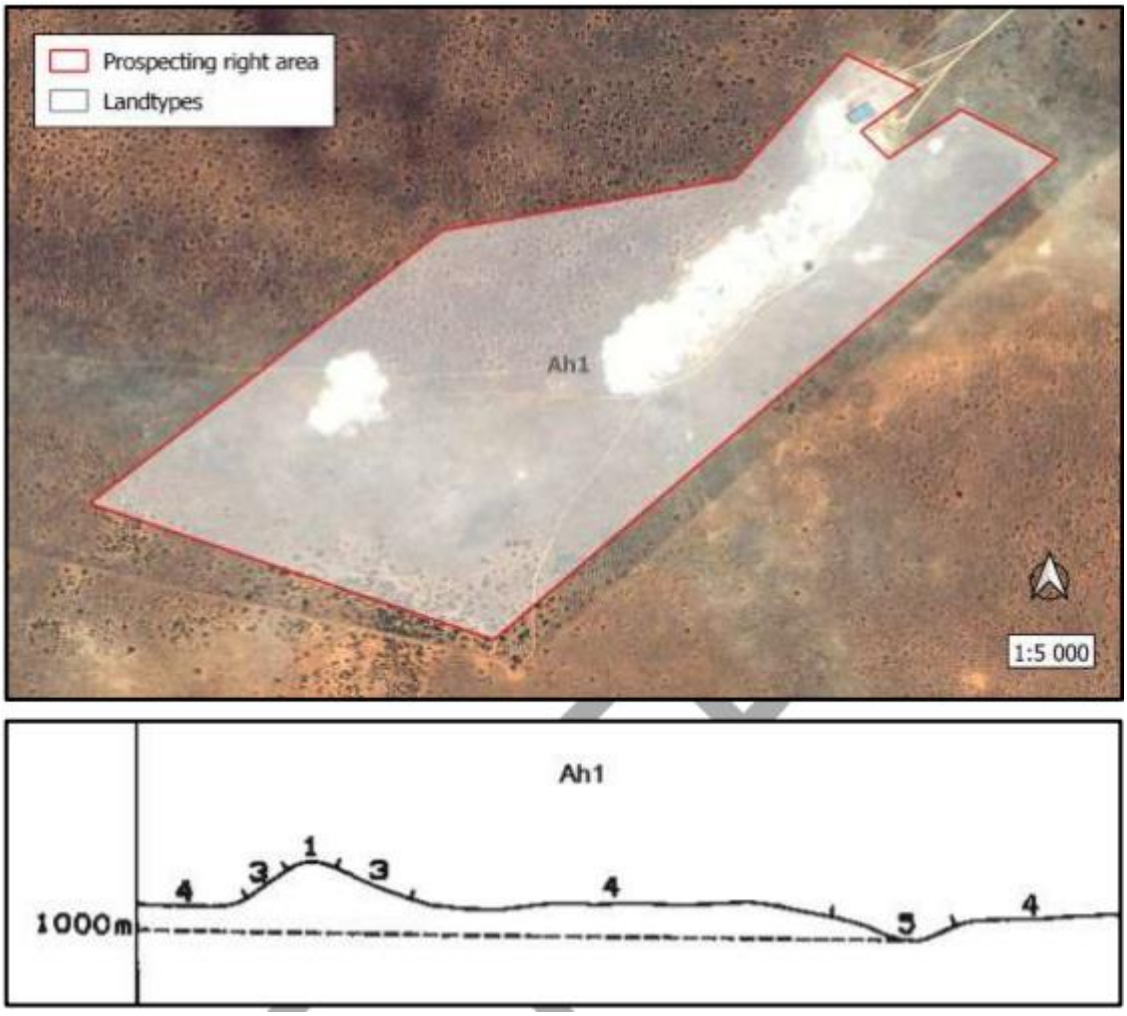

Figure 7. Land types in the area.

(5) LAND CAPABILITY AND LAND USE:

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The major land uses in the region include activities related to agriculture and game farming, and Rossville falls within the North Western Cattle and Game Ranching Rural Livelihood Zone. The land capability for the study area is non-arable, with moderately low potential for grazing and wildlife. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 15 Ha/LSU. Land use on Rossville includes

the existing operation of the applicant, which has been ongoing for 30 years. No other land use is practised on the property.

Land Use before Prospecting

Prior to any prospecting activity the land capability correlated directly with the different soil forms. Before any historical mining/prospecting activity the area would have been suitable for stock grazing.

Evidence of Disturbance
A Mining Permit has been granted to SA Diatomite with some disturbance in the area.

Existing Structures
The prospecting area has a series of access roads and a stores.

(6) *NATURAL FAUNA:*

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Alet Maritz Mynbou (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area and to determine the possible impact of prospecting on the diversity and ecological status of the application area. Fauna was described and included in this report as part of the ecological study (Appendix 6 to the report).

According to Section 3(a) and 4(a) of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009, no person may, without a permit by any means hunt, kill, poison, capture, disturb, or injure any protected or specially protected animals. Furthermore, Section 12 (1) of NCNCA states that no person may, on a land of which he or she is not the owner, hunt a wild animal without the written permission from the landowner.

The landscape features in the study area does not provide diverse habitat opportunities to faunal communities, but the sandy substrates and vegetation provide many micro habitats. Animals likely to be found in the study area are discussed in their respective faunal groups below.

Mammals
As many as 54 terrestrial mammals and seven bat species have been recorded in the region. Of these, six terrestrial mammal species and two bat species are listed either according to the IUCN or South African Mammal Red List. The two listed bat species, Ground Pangolin, African Striped Weasel, South African Hedgehog and Black-footed Cat have a high chance of occurring across the site, given their wide habitat

tolerances or preference for savanna and/or grassland habitats. Leopard and Brown Hyaena have a low potential to be found on site mainly since farm fences are restricting their occurrences across their natural distribution range, and they are also persecuted by livestock farmers.

Furthermore, virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA . Apart from the red listed species already discussed above, those that are specially protected (Schedule 1) include Aardvark, Cape Fox, Bat-eared Fox, Honey Badger, Striped Polecat, Aardwolf, and African Wild Cat. These all have an affinity for savanna-type habitats and therefore a high likelihood to occur on site. Brants' Whistling Rat and Steenbok, both protected under Schedule 2, were recorded on site. The presence of fossorial mammals was also signified through many different burrows, observed during the field survey. Problem animals with a high likelihood to occur here include Black-backed Jackal and Caracal.

Reptiles

The proposed prospecting area lies within the distribution range of at least 46 reptile species, of which none are red listed. However, most are protected either according to Schedule 1, 2 or 3 of NCNCA. Specially protected species (Schedule 1) include Chamaeleo dilepis dilepis (Common Flap-neck Chameleon), Karusasaurus polyzonus (Southern Karusa Lizard) and Python natalensis (Southern African Python). The Southern Karusa Lizard has a low likelihood to be found on site due to their preference for dolerite rock outcrops.

The Southern African Python is associated with a variety of habitats but prefers riverine or rocky areas and is therefore also not expected be found on site. The Namaqua Chameleon, however, has a high chance of occurring on site. They occur in a variety of habitats and is expected to be found high up in shrubs or trees.

The only South African endemic known from the region is Acontias gracilicauda (Thin-tailed Legless Skink). It is fossorial and usually found in moderately mesic soils in open or partly wooded habitats up to 1 600 m.a.s.l. It could potentially occur on site.

Amphibians

Ten amphibian species are known from the region, of which none are red listed. However, all amphibians of the study area are protected according to Schedule 2 of NCNCA. One South African endemic, i.e., Vandijkophrynus gariepensis (Karoo Toad) is known from the region. It is adapted to a wide variety of terrestrial habitats and breeds in different

types of permanent and temporary waterbodies. It could potentially occur on site if any pools form after good rainfall events.
Similarly, any pools forming after large rainfall events are expected to attract most of the remaining frog species for breeding. However, the Bushveld Rain Frog is independent of water and is expected to be found in the study area. Those species that are dependent on perennial waters, i.e., Common Platanna and Common River Frog are not expected to occur on site.

Avifauna

The study site does not fall within or near (< 150 km) any of the Important Bird Areas (IBA) defined by Birdlife South Africa. A total number of 267 bird species have been recorded from the region, of which 28 are listed either in the IUCN or South African Red Data Book of Birds. Of these, Kori Bustard was recorded in the grassland community during the field survey. Furthermore, all birds are protected either according to Schedule 1, 2 or 3 of NCNCA.

Among these, birds with a high affinity for woodland and grassland habitat, i.e. Martial Eagle, Tawny Eagle, Bateleur, Lanner Falcon, Red-necked Falcon, Red-footed Falcon, White-backed Vulture, Secretarybird, Lappet-faced Vulture, Kori Bustard, Roller- and Owl species, have the highest likelihood to occur on site and are expected to forage, nest or pass through the shrubland and grassland communities.

The protected water birds (i.e., Chestnut-banded Plover, Storks, Black-winged Pratincole, Maccoa Duck, Lesser Flamingo and Greater Flamingo) and high-altitude rock associated species (Verreaux's Eagle, African Rock Pipit and Cape Vulture) are not expected to occur on site.

Fish

In addition to those regulations in the NCNCA pertaining to wild animals, Section 32 and 33 of the NCNCA states that no person may, without a permit angle and not immediately release, catch, import, export, transport, keep, possess, breed, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) fish. However, no suitable habitat for fish occurs on site and therefore no fish species are expected to occur in the study area.

Invertebrates

Invertebrates dominate inland habitats and play a significant role in the overall function of the ecosystem (Kremen et al. 1993; Weisser and Siemann 2004). In general, they are widely distributed and extremely diverse, which makes it almost impossible to list all species that may possibly occur on site without a dedicated monitoring programme.

Invertebrates have also not been surveyed as comprehensively as plants and mammals and therefore current available data on their distribution is much scarcer. Nevertheless, key morphospecies and species of conservation concern are discussed here, as well as the major habitats which delimit possible invertebrate communities on site.

Seventeen invertebrate species of the Northern Cape appear on the IUCN Red Data list of threatened species! Among these, one species, i.e., Anthene lindae, Linda's Hairtail (Near Threatened) is known from the study region and could potentially occur on site. The adult butterflies are usually found on scattered Vachellia erioloba trees, which is believed to be the larval host plant. None were however observed during the field survey.

In addition, those species that are specially protected according to Schedule 1 of the NCNCA include all Velvet worms as well as some baboon spider species, Stag Beetles and the Flightless Dung Beetle. Of these, Common Baboon Spiders (Harpactira baviana) have been recorded in the region and could potentially also be found on site. It prefers arid and semi-arid grassland and is found under stones, generally in shallow excavations but sometimes in short burrows a few centimetres deep. All Rock- Creeping- and Burrowing Scorpions are protected according to Schedule 2 of the NCNCA, along with several beetles, butterflies and moths. Of these, burrowing scorpions (Opistophthalmus carinatus), Monster Tiger Beetles (Manticora sp.), Gossamer-winged Butterflies, Skippers, Brush-footed Butterflies and Satyrs have been recorded in the region and have a high likelihood to be found on site.

The major habitat delimiting possible invertebrate communities in the study area is classified as bushveld for insect preference (Picker et al. 2004). Invertebrates associated with this habitat are expected to be widespread and diverse. Insect activity during the field survey was limited by the dormant state of the vegetation, but Cicadas and Community Nest Spiders were common.

(7) Flora:

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Broad-scale vegetation patterns

The study area falls within the Savanna Biome (Mucina and Rutherford 2006). According to the vegetation map of Mucina and Rutherford (2012), the site is represented by one broad-scale vegetation unit, i.e. Gordonia Plains Shrubland (Figure 8).

Gordonia Plains Shrubland is found in the Northern Cape at altitudes between 900 and 1 250 m. It forms a broad north-south band from Van Zylsrust in the north to south-west of Witsand in the south, where it occurs on the flats west of the Korannaberg and Langeberg Mountains, and east of the main Kalahari duneveld area. Some isolated patches are embedded in the duneveld area between Auob and Nossob Rivers in the Kgalagadi Transfrontier Park as well as in the valleys containing Groot and Klein Mier, south of the park.

The topography typically comprises plains with no dunes and the vegetation occurs mainly as open grassland with occasional shrubs Rhigozum trichotomum and Grewia flava. The trees Vachellia haematoxylon and V. erioloba are also sparsely scattered across the unit. The geology and soil comprise aeolian sand underlain by calcrete of the Kalahari Group and land types mainly include Ah and Af.

The unit is classified as least threatened, with 9% being conserved in the Kgalagadi Transfrontier Park. Very little of this unit has been transformed and erosion is very low. Important taxa include Kalahari endemics (Vachellia haematoxylon, Hermannia burchellii and Anthephora argentea), but none are limited to this unit.

Fine-scale vegetation patterns

Plant communities in the study area are delineated according to plant species correspondences and changes in soil structure. They can be divided into two distinct units, which are described below. These descriptions include unique characteristics and the dominant species found in each unit. Those areas that have already been transformed by past mining activities are not included in the vegetation descriptions.

Figure 8. The broad-scale vegetation unit (Mucina and Rutherford 2012) present in the study area.

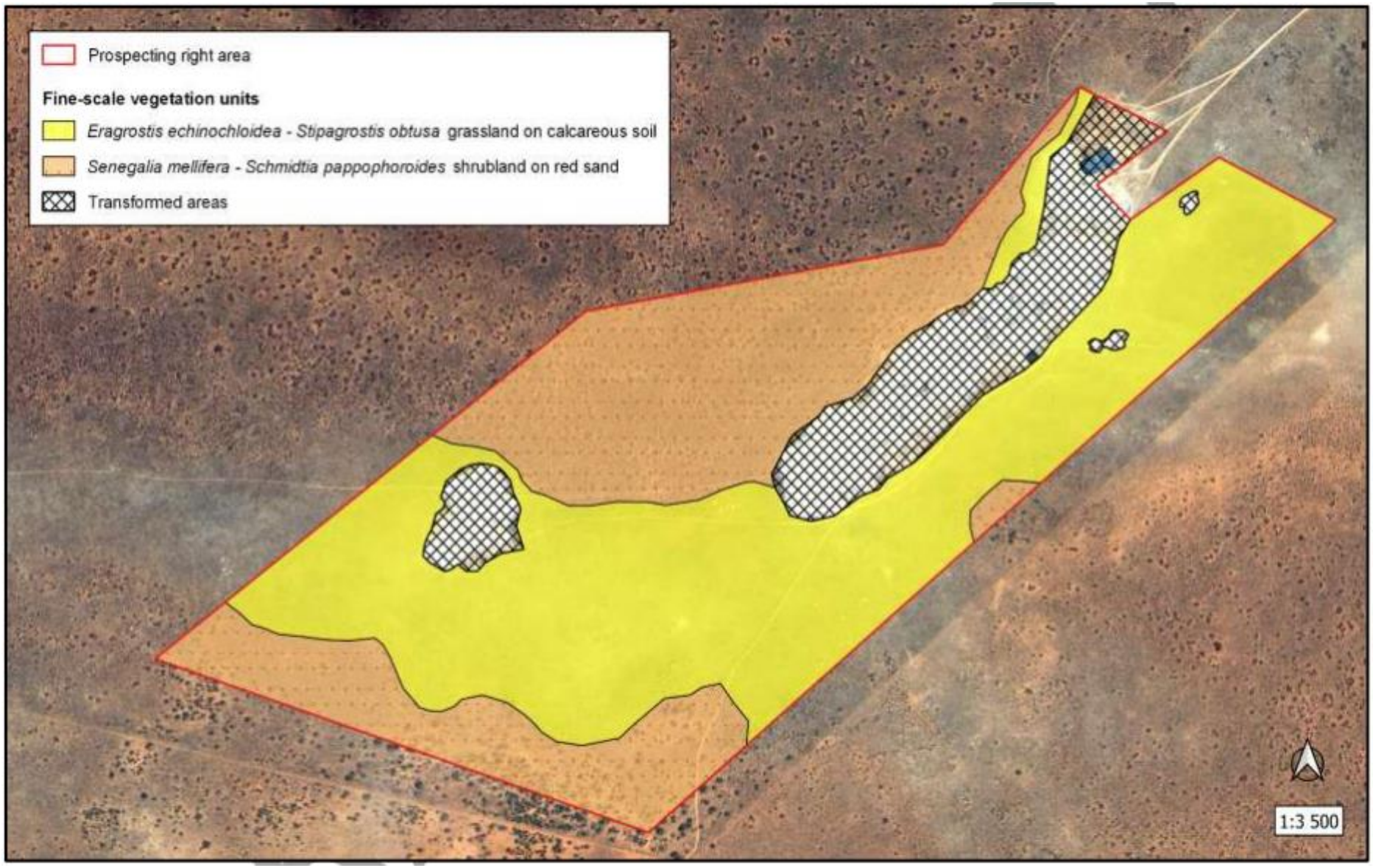


Figure 9. The distribution of fine-scale plant communities in the study area.

i) Senegalia mellifera – Schmidtia pappophoroides shrubland on red sand

This community lines the boundary of the study area in the north and south (Figure 9), where red sand constitutes between 10 and 20 % of the ground cover. The vegetation is primarily presented as a shrubland where Senegalia mellifera dominates the tall shrub layer, while the grassy matrix is dominated by Schmidtia pappophoroides.

Other common trees and tallershrubs that are found scattered in this community include Vachellia erioloba, V. haematoxylon, V. hebeclada, Lycium hirsutum, L. cinereum, Grewia flava, and Rhigozum trichotomum. Low shrubs include Aptosimum marlothii, A.albomarginatum, Plinthus karooicus, Eriocephalus ericoides, Justicia incana, J. divaricata, Pentzia calcarea, Asparagus exuvialis, and Salsola sp.

Apart from the dominant grass species already mentioned, other common grasses include Eragrostis lehmanniana, E. rigidior Stipagrostis obtusa, S. ciliata, and Aristida congesta subsp. congesta.

Dicoma capensis was the only herb species noticeable during the field survey.

ii) Eragrostis echinochloidea - Stipagrostis obtusa grassland on calcareous soil

This community is located across the centre of the study site on the alluvial plains. Here, light-coloured calcareous soil constitutes around 10 % of the ground cover and biological crusts are also common. The vegetation occurs as grassland where a dense grassy layer is intermixed with low shrubs.

The grass layer is dominated by Eragrostis echinochloidea and Stipagrostis obtusa, with Eragrostis rigidior also being abundant. Other grasses include Schmidtia pappophoroides, Aristida congesta subsp. congesta, Stipagrostis uniplumis and S. ciliata.

The low shrub layer is diverse, with Roepera lichtensteiniana, Justicia australis and Salsola sp. being most abundant. Other species include Peliostomum leucorrhizum, Melolobium candicans, Pentzia calcarea, Tetraena simplex, Plinthus karooicus, Oedera humilis, Lycium cinereum, Thesium hystrix, Felicia fascicularis, Eriocephalus ericoides, Barleria rigida, Justicia incana, Aptosimum albomarginatum, A. marlothii, Asparagus exuvialis, Pegolettia retrofracta and Helichrysum lucilioides. Taller woody species, like Vachellia haematoxylon, Grewia flava and Rhigozum trichotomum are sparsely scattered in the grassy matrix.

The herb Geigeria ornativa is common in this unit.

Population of sensitive, threatened, and protected plant species

The SANBI Red List provides information on the national conservation status of South Africa's indigenous plants, while the National Forests Act (No. 84 of 1998) (NFA) and the Northern Cape Nature Conservation Act (Act No. 9 of 2009) (NCNCA) restricts activities regarding sensitive plant species. Section 15 of the NFA prevents any person to cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. Section 49 (1) and 50 (1) of the NCNCA states that no person may, without a permit pick, transport, possess, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) plants. Furthermore, Section 51(2) states that no person may, without a permit, pick an indigenous plant (Schedule 3) in such manner that it constitutes large-scale harvesting.

All species recorded in the region are classified as least concern; a category which includes widespread and abundant taxa. Species protected in terms of the National Forests (NFA) Act No 84 of 1998 include Vachellia erioloba, V. haematoxylon and Boscia albitrunca. The latter species is also protected according to the NCNCA (Schedule 2), but it does not occur in the proposed prospecting area. Vachellia erioloba is restricted to the shrubland on red sand. Here it is scattered across the community, occurring at low densities of ± 2 individuals per hectare, from saplings (80 cm (h) x 1 m (w)) to large adult trees (3 m (h) x 5 m (w)). Vachellia haematoxylon occurs in both communities at low densities. In the grassland, it is scattered sparsely at < 1 individual per hectare and occur as young shrubs (1m (h) x 1m (w)). It is slightly more abundant in the shrubland on red sand, with densities of ± 1 individual per hectare, occurring as larger shrubs of up to 1.5m (h) x 3 m (w). To damage or remove any of these protected trees (seedlings to adults) a licence application must be submitted to the Northern Cape Department of Agriculture, Forestry and Fisheries (DAFF) at least three months prior to such activities.

Protected species in terms of Schedule 1 and 2 of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009 is listed in Table 4 of the study. None of these species were recorded during the field survey, but Jamesbrittenia atropurpurea subsp. pubescens has a high likelihood to occur in the grassland on calcareous soil and Lessertia frutescens subsp. frutescens in the shrubland on red sand. A photographic guide to those species of conservation concern encountered during the survey, and

with a high potential to occur on site is attached as Appendix 3 to the study.

In addition to those protected species listed above; according to Section 51(2) of NCNCA, a permit is required from the Northern Cape, Department of Environment and Nature Conservation (DENC) for any large-scale clearance of all indigenous (Schedule 3) vegetation, at least three months before such activities commence.

Although not formally regulated, the biological soil crusts associated with the calcareous soils of the grassland () are very sensitive microhabitats and an integral component of arid environments. This crust is a thin layer of living material formed in the uppermost millimetres of soil where soil particles are aggregated by a community of highly specialized organisms, including cyanobacteria and other bacteria, microfungi, algae, lichens, and mosses. The crust is crucial for soil stabilization, water retention, and soil fertility and is recognized as having a major influence on global ecosystems (Belnap and Weber 2013). After disturbance, the biological soil crust may take 250 to 1 000 years in very dry regions to recover.

Weeds and invader plant species

Weeds and invasive species are controlled in terms of the National Environmental Management: Biodiversity (NEMBA) Act 10 of 2004, the Conservation of Agricultural Resources (CARA) Act 43 of 1993, as well as the NCNCA (Schedule 6). These are species that do not naturally occur in a given area and exhibit tendencies to invade that area, and others;
at the cost of locally indigenous species. To govern the control of such species, NEMBA and CARA have divided weeds and invader species into categories. All declared weeds and invasive species recorded in and around the study area are listed in Table 3, along with their categories according to CARA, NEMBA and NCNCA.

Table 3. A list of declared weeds and invasive species recorded in and around the study area.

Scientific name	Common name	CARA	NEMBA	NCNCA
Argemone mexicana	Yellow - flowered Mexican poppy	1	1b	S6

Indicators of bush encroachment

Bush encroacher species are controlled in terms of Regulation 16 of CARA; where land users of an area in which natural vegetation occurs and that contains communities of encroacher indicator plants are required to follow sound practices to prevent the deterioration of natural resources and to combat bush encroachment where it occurs.

Declared indicators of bush encroachment in the Northern Cape, which were recorded in and around the study area, are listed in Table 4.

Table 4. A list of declared indicators of bush encroachment in the Northern Cape from the study area.

Scientific name	Common name
Euclea crispa	Blue guarri
Grewia flava	Velvet Raisin
Rhigozum trichotomum	Three-thorn rhigozum
Senegalia mellifera	Black thorn

SURFACE WATER

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Alet Maritz Mynbou (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area and to determine the possible impact of prospecting on the diversity and ecological status of the application area. Surface Water was described and included in this report as part of the ecological study (Appendix 6 to the report).

The National Water Act (36 of 1998) (NWA) provides a framework to protect water resources. According to this Act, a water resource includes a watercourse, surface water, estuary, or aquifer; whereas a water course includes:
a) a river or spring,
b) a natural channel in which water flows regularly or intermittently,
c) a wetland, lake or dam into which, or from which, water flows, and
d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse.

Any reference to a watercourse includes its bed and banks and a water resource does not only include the water within the system, but also the entire water cycle, i.e. evaporation, precipitation, the habitats and processes.

The purpose of this Act (Section 2) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors - (g) protecting aquatic and associated ecosystems and their biological diversity and (h) reducing and preventing pollution and degradation of water resources. No activity may take place within a watercourse unless it is authorised by the Department of Water and Sanitation (DWS). Any

area within a wetland or riparian zone is therefore excluded from development unless authorisation is obtained from DWS in terms of Section 21 (c) and (i).

The study area falls within the Neusberg quaternary catchment D73C of the Lower Orange River Water Management Area (Figure 10). The quaternary catchment has been allocated a Present Ecological State (PES) of 'moderately modified' (C) by Smook et al. (2002) and information regarding mean annual rainfall, evaporation potential and runoff for the quaternary catchment is provided in Table 5.

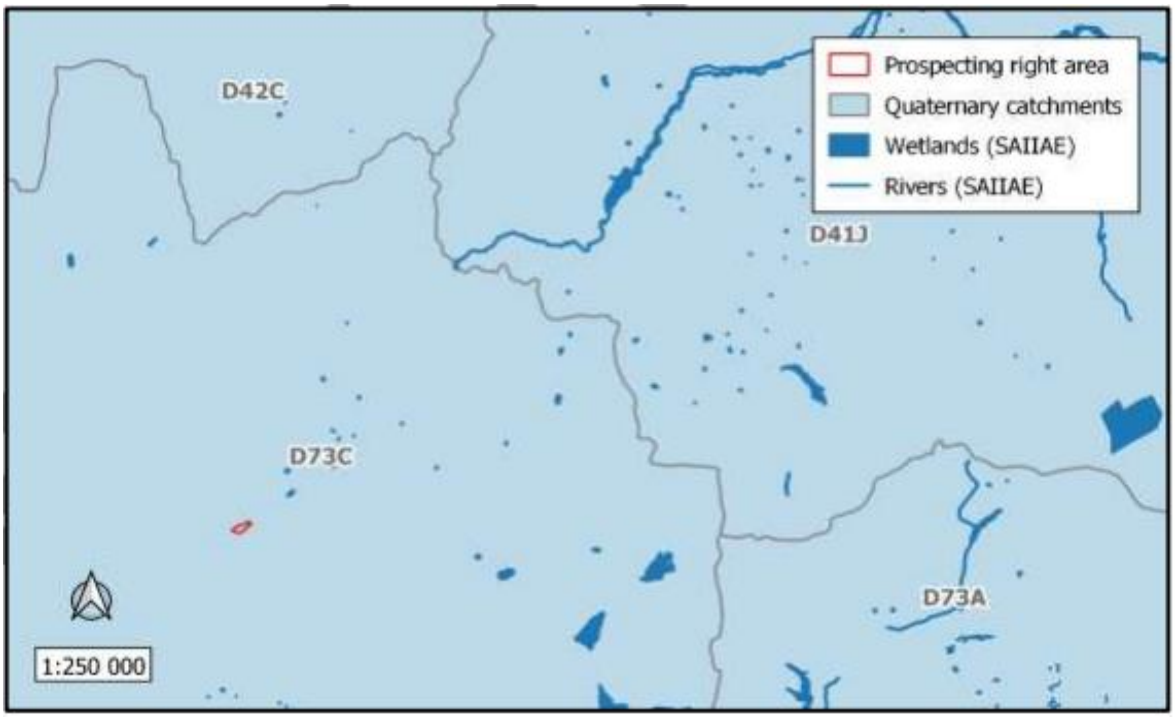


Figure 10. The locality of the proposed prospecting area in relation to the quaternary catchments of the Lower Orange Water Management Area.

Table 5. Catchment characteristics for the Neusberg quaternary catchment in which the study area falls,
as presented by Smook et al. (2002)

Quaternary catchment	Catchment Area (km^2)	Mean Annual Rainfall (mm)	Mean Annual Evaporation (mm)	Mean Annual Runoff (10^6 m^3)
D73C	6 221	230	2 450	30.07

According to the South African Inventory of Inland Aquatic Ecosystems (SAIIAE), the study area falls within the Eastern Kalahari Bushveld Bioregion, where 1.3 % of the land area is covered by inland wetlands, including depressions, floodplains, seeps and valley-bottom wetland

types (Van Deventer et al. 2019). The spatial extent according to the SAIIAE present ecological status per wetland type is depicted in Table 6. Depressions are most abundant in the bioregion, with the majority in natural or near-natural condition. The remaining wetland types have been moderately to severely modified.

Table 6. Percentage of inland wetland spatial extent according to the present ecological status per wetland type of the Eastern Kalahari Bushveld Bioregion

Wetland type	Total Extent (%)	% Natural or near-natural (A/B)	% Moderately modified (C)	% Heavily to severely/critically modified (D/E/F)
Depression	57.1	70.5	5.7	23.8
Floodplain	2.2	0.6	48.8	50.5
Seep	17.2	10	15.1	75
Valley-bottom	23.5	0.9	29.6	69.5

No natural wetlands or rivers occur in the study area. The natural ephemeral drainage line that flows into the property from the north-east has already been altered through past mining activities.

Classification of the Watercourse

Wetlands

In terms of Auquatic Biodiversity Sensitivity the screening report done for the Envirnmental Authorization indicates that the theme has a low risk sensitivity.

Figure 11. Aquatic Biodiversity Combined Sensitivity for the proposed site.

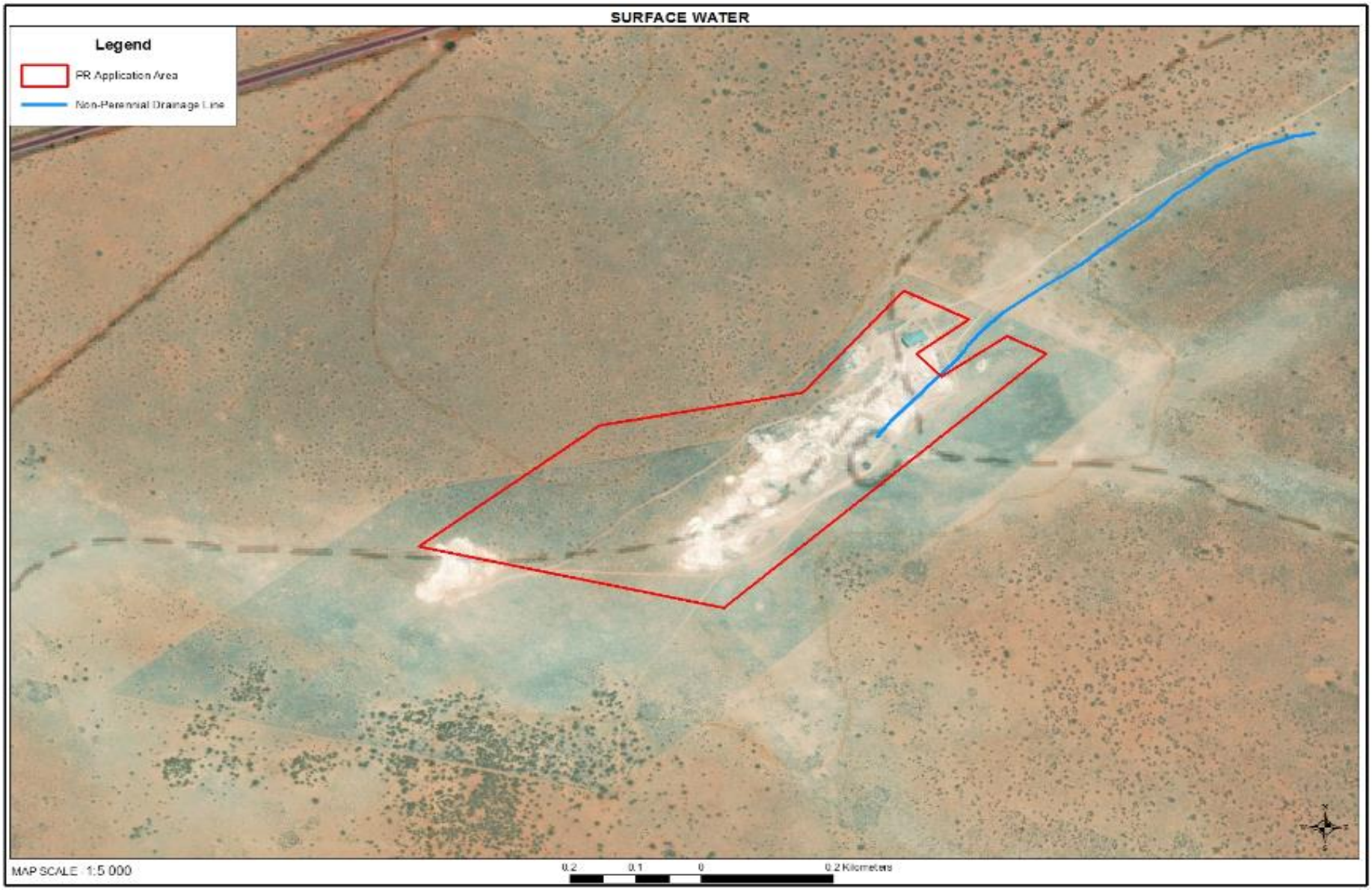


Figure 12. See dry Non- Perrennial Drainage channels indicated in blue on the proposed Prospecting area.

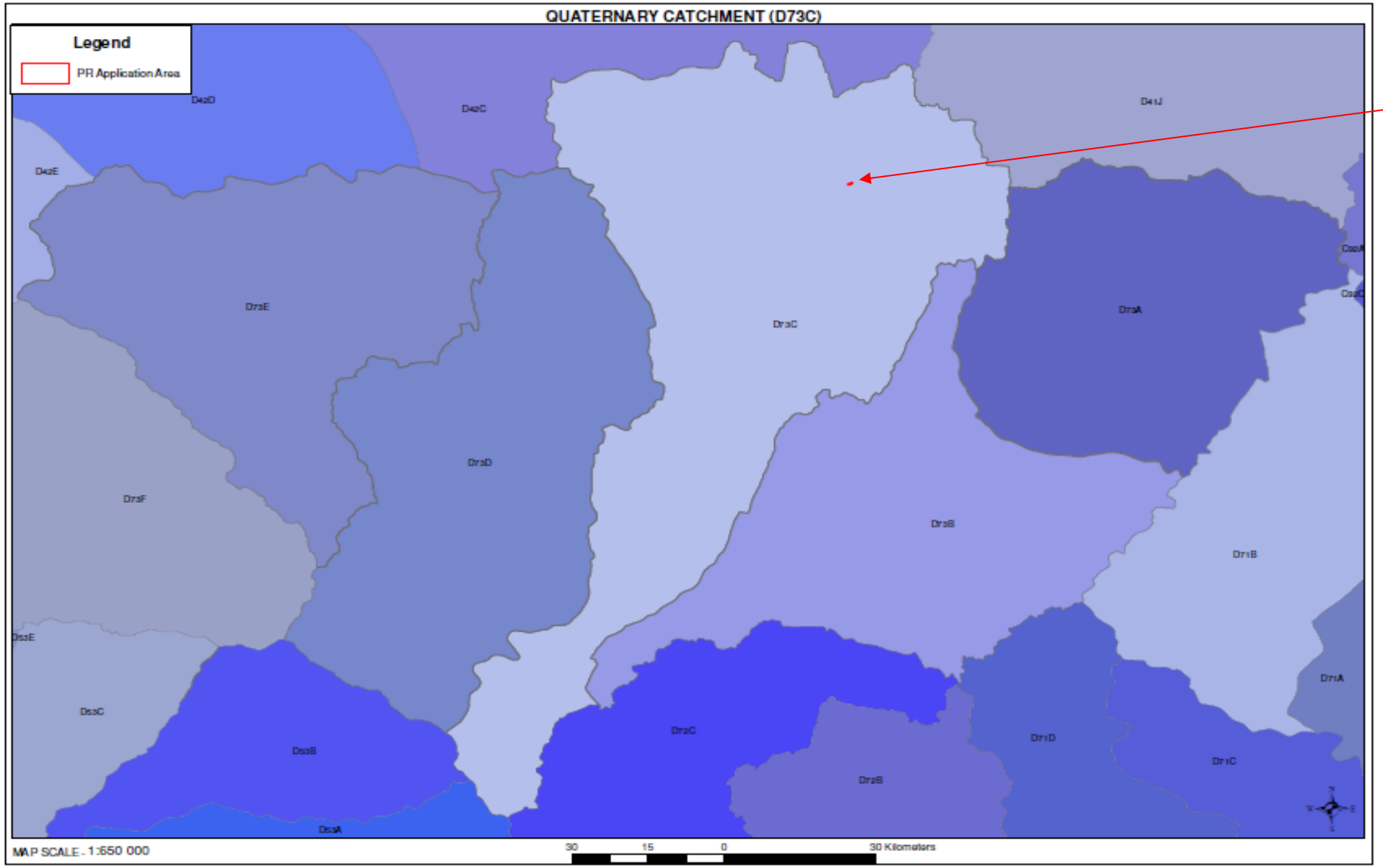


Figure 13. Catchment area

(8) *GROUND WATER:*

Depth of water-table(s):

Ground-water zone:
The kieselguhr bulk sampling does not affect the quality of the ground water in any manner. NO water is used in the process and therefore no no harmful or toxic properties are encountered in the Kieselgurh deposits.

(9) *AIR QUALITY AND NOISE:*

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

Existing Sources
Farming activity, especially ploughing of the irrigation fields, may generate dust during certain periods of the year. Furthermore, dust produced by vehicles moving on gravel roads can reduce the air quality. The general air quality on the area is expected to be good.

New source
The source of air pollution on the farm will be nuisance dust generated by the bulk sampling Prospecting process, the loading of kieselguhr onto the transport trucks, as well as from the movement of trucks and vehicles on the prospecting roads. Gas emissions from machinery will be within legal limits.

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

The dust is controlled by watering down the roadway used by these trucks while bulk sampling.

A complain register for surrounding owners and the community will be kept on site and the management of dust would be guided by these additionally comments of public.

Noise

Existing sources:

Noise on site will come from the equipment used for bulk sampling (tip trucks, front-end loader, back actor). The N14 which goes past the proposed site also contributes to the noice in the area.

There are farming operations on both sides of the proposed prospecting operation. Although these operations do generate noise the overall impact can be described as negligible.

The impact would be of more importance regarding the direct worker environment that should adhere to the requirements in terms of the Mine Health and Safety Act. These noise levels will be continuous and the operators will be issued with earplugs.

Noise is normally encountered during the normal operation hours at the bulk sampling site. Bulk sampling noise and mine vehicles are limited between 7am and 5pm every day during the week. Noise levels will be monitored on the prospecting area and where necessary, protective equipment is used in certain areas where machinery is used.

(10) **VISUAL ASPECTS:**

The prospecting site would possibly be visible form the national tar road, N14. There is however no method of reducing the impact during bulk sampling operations (operational phase), it can only be mitigated by doing concurrent rehabilitation of open pits as prospecting progress.

(11) **AREAS OF CULTURAL-HISTORICAL OR ARCHAEOLOGICAL INTEREST**

Dr. E. Matenga was appointed to conduct a Heritage Impact Assesment for the prospecting right application. The study includes information gathered from a desktop study as well as from a site inspection conducted on 5 July 2021 (Study appended as Appendix 4).

General observations

A thick cover of grass impaired ground visibility. Barring this constraint, over a long period of time the windblown Kalahari sands would tend to cover surface scatters of artefacts.

The Stone Age

No Stone Age tools were found.

The Early Iron Age

No sites dating to the Iron Age were found.

The Later Iron Age

No sites of the Later Iron Age period were found.

Burial grounds

There are no burial grounds on the property.

CONCLUSION AND RECOMMENDATIONS

In light of these findings, it is recommended that the mineral prospecting can go ahead. As a standard precaution, archaeological deposits are usually buried underground. Should archaeological artefacts or skeletal material be exposed in the area during construction, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

Palaeontological

Prof Marion Bamford was appointed to conduct a desktop Palaeontological Impact Assesment for the prospecting right application. (Study appended as Appendix 5).

Palaeontological context

The Kathu Complex includes the excavated sites of Kathu Pan1 (KP1), Kathu Townlands and Bestwood 1 (BW 1). At Kathu Pan, evidence of early hominin occupation has been observed at multiple locations within the pan, but ESA deposits have only been excavated at KP 1. Stratum 4a at KP1 was dated by a combination of OSL and ESR/U-series to ca. 500 k BP. The lithic assemblage from St. 4a is characterized by a prepared core technology that produced both blades and points, and has been attributed to the Fauresmith industry. The lithic assemblage of the underlying St. 4b at Kathu Pan 1 is characterized by well-made handaxes, some bones and other tools (Beaumont, 2004; Walker et al., 2014; Lukich et al., 2020).

Palaeo-pans and palaeo-springs are visible in satellite imagery because of their topography and often are associated with lunette dunes. Vegetation changes are also common. No such features are seen in the Google Earth images. Aeolian sediments that cover most of the region, do not preserve fossils because they have been reworked and windblown.

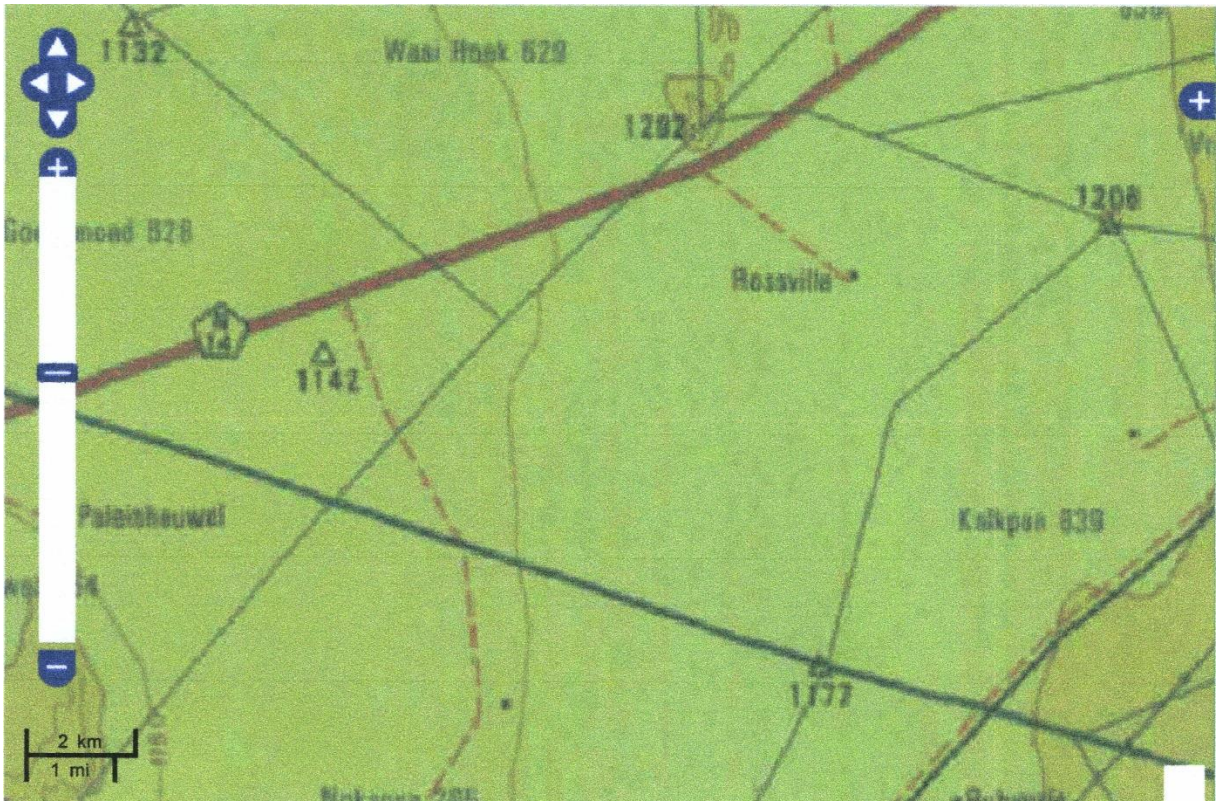


Figure 14. SAHRIS palaeosensitivity map for the site for the proposed Prospecting Rights on Farm Rossville 638 shown within the blue rectangles. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the quartzites, sandstones, shales and sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material. The loose sands of the Tertiary and Quaternary period would not preserve fossils. Only palaeo-pans or palaeo-springs could preserve fossils but no such feature is evident.

Recommendation

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Quaternary aeolian sands. There is a very small chance that fossils may occur in pans or springs but none is evident. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once drilling or excavations for prospecting have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.

The site for prospecting lies on the ancient and non-fossiliferous strata of the Olifantshoek Supergroup, and the Quaternary aeolian sands that are potentially

fossiliferous. Fossils could be found in palaeo-spring and palaeo-pan sites but none is visible from the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found once drilling or excavations for the prospecting activities have commenced.

Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

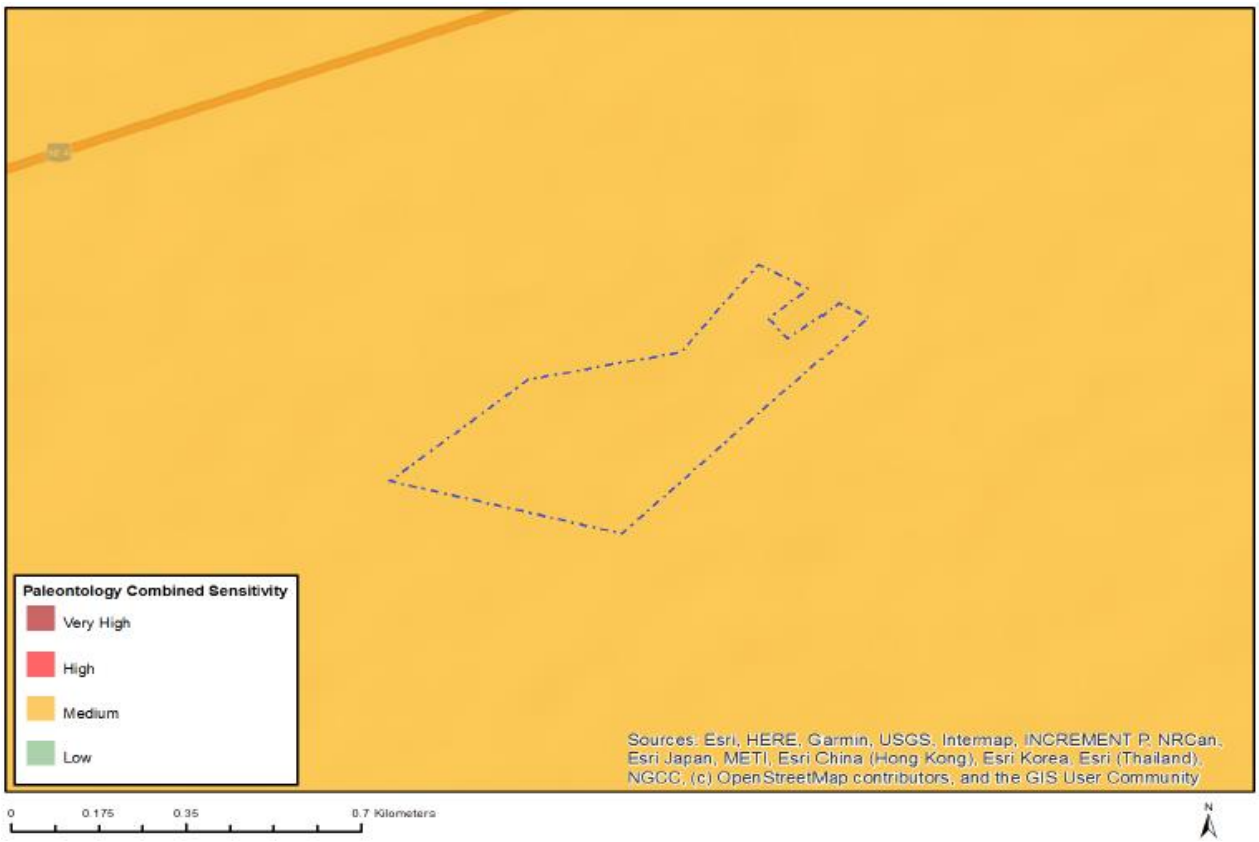


Figure 15. Paleontological Combined Sensitivity for the proposed site.

(12) ***BROAD-SCALE ECOLOGICAL PROCESSES:***

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Alet Maritz Mynbou (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area and to determine the possible impact of prospecting on the diversity and ecological status of the application area. Broad-scale ecology was described and included in this report as part of the ecological study (Appendix 6 to the report).

The proposed prospecting site does not fall within a critical biodiversity area, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen 2016). This map identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. The entire site is classified as a Transformed Area.

Furthermore, none of the habitats in the study area have been identified as threatened ecosystems, but the Gordonia Plains Shrubland has been

classified to have Medium Conservation Priority within the Z F Mgcawu District Municipality.

The National Web based Environmental Screening Tool considers some parts of the study area to be sensitive (Figure 16). This tool is a geographically based web-enabled application which allows a proponent intending to apply for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (as amended), to screen their proposed site for any environmental sensitivity. According to this the entire study area is of low sensitivity based on the Plant Species-, Aquatic- and Terrestrial Biodiversity Themes. In terms of the Animal Species Theme, however, a small area in the north-east is of medium sensitivity. This sensitivity is based on the associated habitat for the Vulnerable Ludwig's Bustard.

The study area also falls within the core area of the Griqualand West Centre (GWC) of Endemism as defined by Frisby et al. (2019) (Figure 17). A centre of plant endemism is an area with high concentrations of plant species with very restricted distributions, known as endemics (Van Wyk and Smith 2001). Relatively small disturbances in a centre of endemism may easily pose a serious threat to its many range-restricted species. Endemics are specifically vulnerable due to their restricted distribution ranges.

Similarly, the Mining and Biodiversity Guidelines (DENC et al. 2013) does not classify any section on Rossville to have biodiversity importance, and therefore does not constitute a risk for mining.

These guidelines were developed to identify and categorize biodiversity priority areas sensitive to the impacts of mining to support mainstreaming of biodiversity issues in decision making in the mining sector.

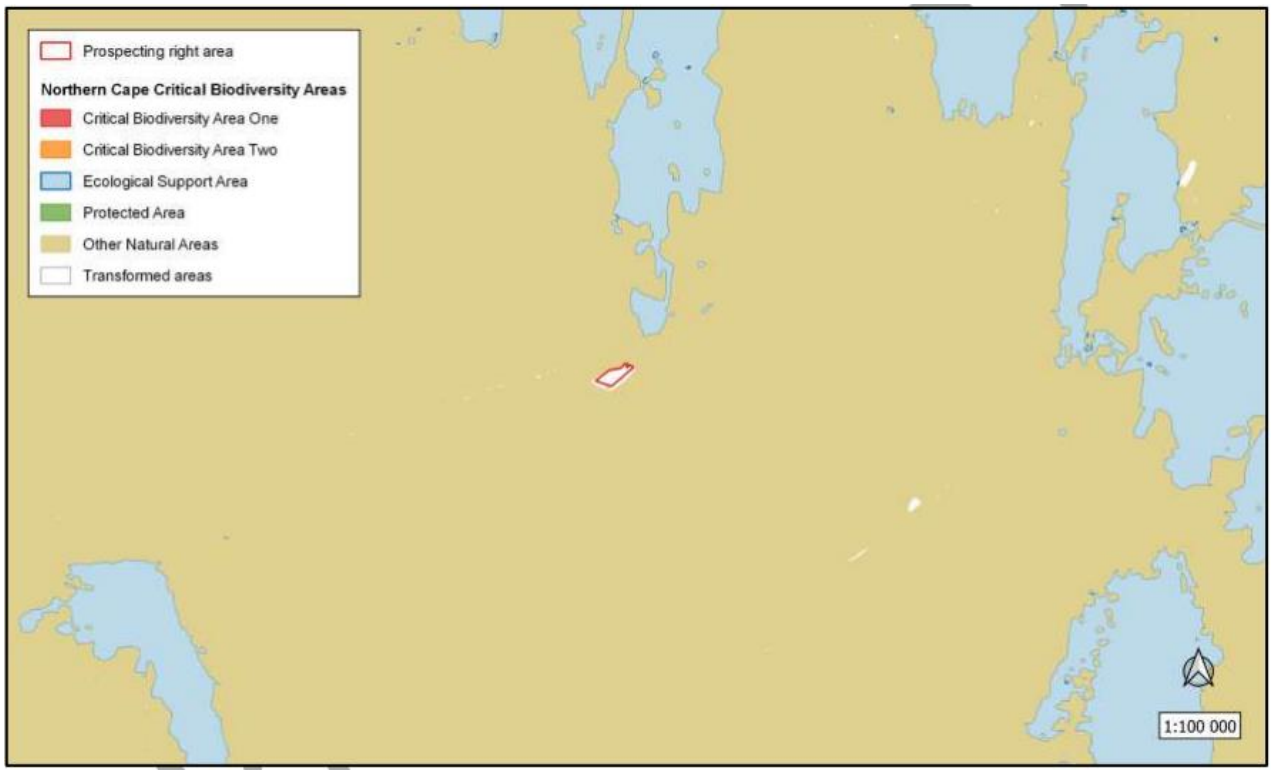


Figure 16. The study area in relation to the Northern Cape Critical Biodiversity Areas.

Figure 17. Environmental sensitivities associated with the study area, according to the National Web based Environmental Screening Tool, with Rossville indicated.

Figure 18. The study area in relation to the GWC core, according to Frisby et al. (2019).

With regards to the broad-scale vegetation units of the study area, according to Mucina and Rutherford (2012) the Gordonia Plains Shrubland vegetation is least threatened, with little transformation. However, mining has contributed significantly to habitat transformation in the region (Figure 18), and this prospecting operation will further contribute to the cumulative impacts thereof.

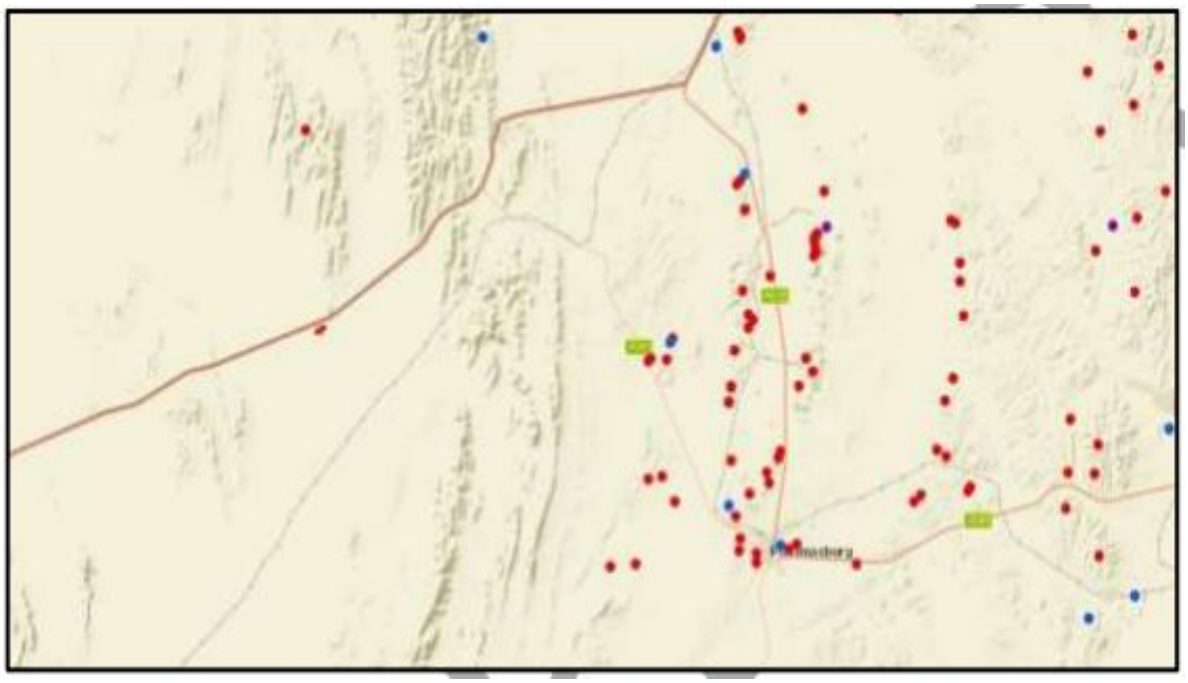


Figure 19. Past and present mining operations near the study area, which increases the cumulative impacts on habitat transformation in the region.

(13) ***SOCIO-ECONOMIC STRUCTURE OF THE REGION:***

The following information is gathered from the Tsantsabane approved 2020/2021 IDP.

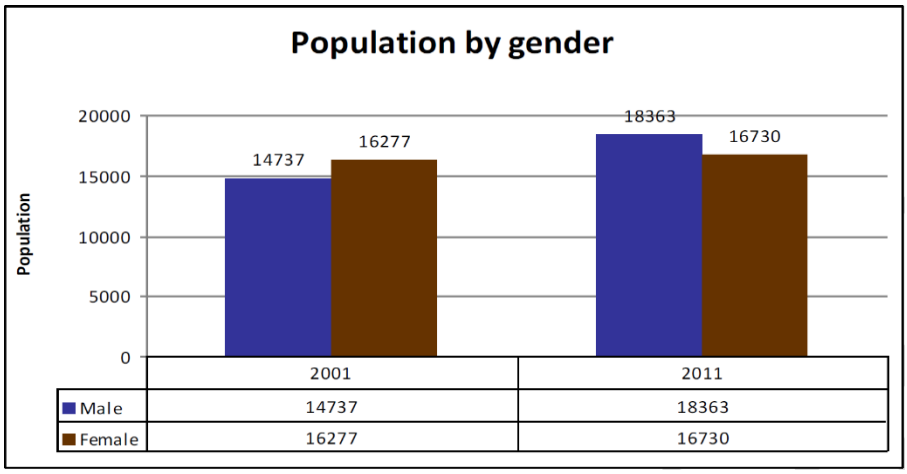
Population density, growth and location

Tsantsabane Local Municipality is situated in the ZF Mgcawu District Municipality and covers geographic area of 5 887km^2. The municipal area falls in the Gamagara Corridor. The NCPSDF (2012: 68) defines the Gamagara Corridor as "comprises the mining belt of the John Taolo Gaetsewe and Siyanda (ZF Mgcawu) districts and runs from Lime Acres and Danielskuil to Hotazel in the north. The corridor focuses on the mining of iron and manganese".

Population Profile

According to the Census 2011 the population figures for Tsantsabane Local Municipality is 35 093, this indicates a population growth of 4079 from population size of 31 014 (Census 2001). However incremental community survey dating indicates that the municipality has 9839 households. The attributing factor to this population growth is the increase of people who come to the municipal area in search for better living conditions or jobs in the mining and solar industrial sectors.

Graph 1 indicates the population growth of the Tsantsabane Municipality by gender. The graph indicates that the total amount of males living in the municipality has increased by 24.6% from 14 737 in 2001 to 18 363 in 2011. An increase in the population of the women in the municipality has also increased from 16277 in 2001 to 16730 in 2011. The municipality has more males than females and the reason could be derived from the male dominated employment industry as there are a lot of mines in the area.



Graph 1: Population by gender for the Tsantsabane Municipality.

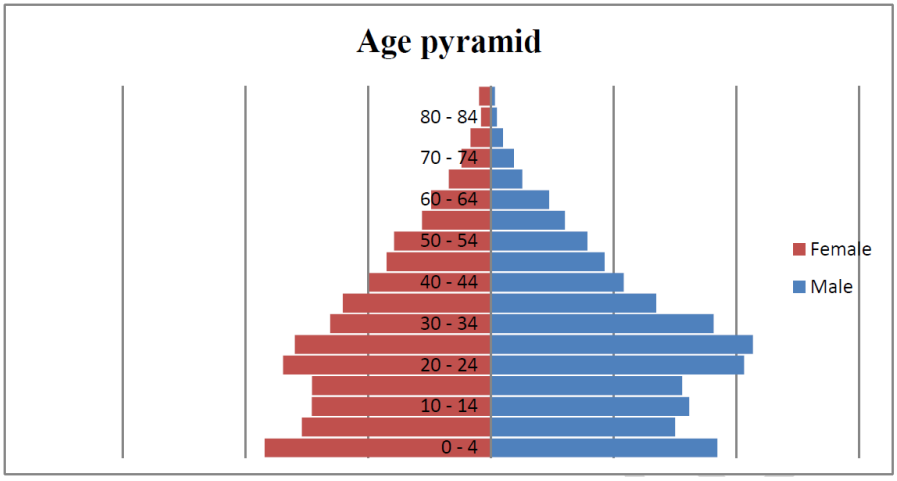
Tsantsabane has a total population of 35 093 and table 7 is a summary of the population by gender and ethnic groups. Out of the whole

population 54% are black male followed by 36% coloured males then 8% white and lastly 1% Indians. For females there are 51% black Africans followed by 40% coloured females then lastly 9% of whites in the municipal area.

Table 7: Population by gender and ethnic groups for Tsantsabane.

	Male	% Male	Female	%Females	Total
Black African	9939	54	8589	46	18528
Colored	6564	50	6620	50	13184
Indian or Asian	185	82	39	18	224
White	1506	51	1427	49	2933
Other	169	76	54	24	224
Total	18363	52	16730	48	35093

The age pyramid (Graph 2) indicates that the population of Tsantsabane is predominantly young people. There is a small percentage of people older than 60 years. The age pyramid further indicates that approximately 31% of the population is under 14 years and approximately 33% is between 15 and 34 years.



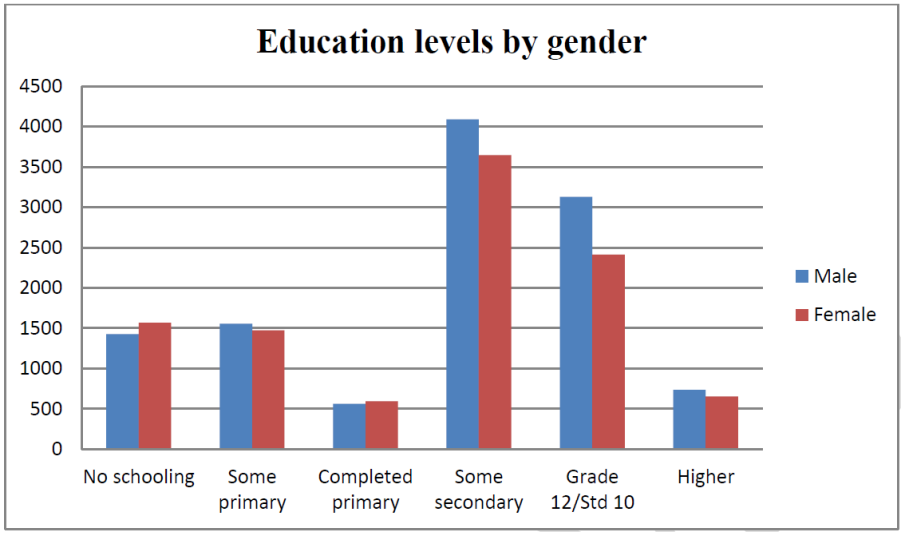
Graph 2: Age pyramid for the Tsantsabane Muncipality.

Education Levels

Education prepares individuals so that they are able to play an active role in the labour market, which directly affects their quality of life as well as the economy of a country and the area they live in. Through the education level, one can understand the skills that an area has and its potential to contribute positively to the economy (Stats SA).

For the Tsantsabane Municipality the statistics indicate that although a high number of students enroll for primary school a very low number of students complete grade 12. This has resulted in a very low probability for employment. Only 5% of those who enrolled for grade 1 make it into tertiary. Less than 15% of the population has a tertiary qualification or have completed Grade 12. It must, however, be mentioned that the

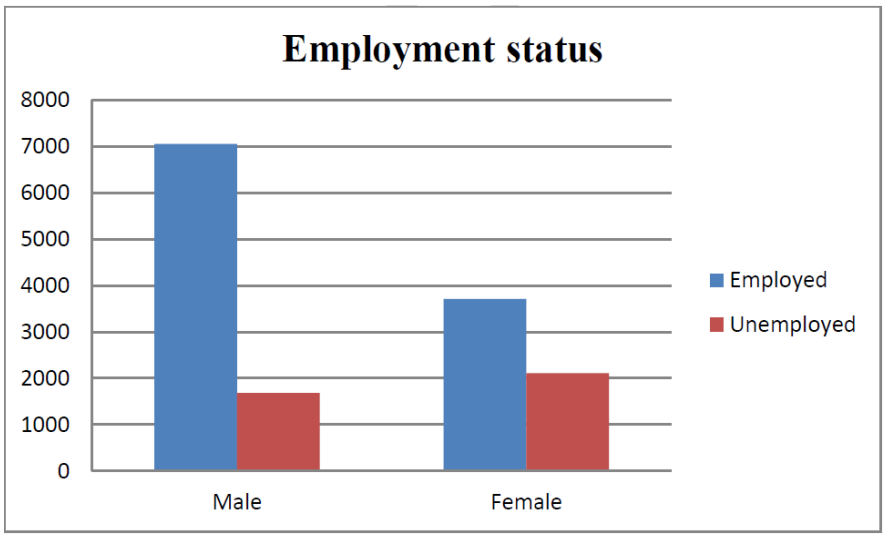
education level is affected negatively by the urbanization process, in the past since it mostly involves matriculates and those with a better qualification, due to the local lack of job opportunities. This can also be attributed to the fact that the nearest University of Technology (Central University of Technology, in Bloemfontein) is almost 400km away and the Sol Plaatjie University has recently started a limited offering of some courses. Males seems to be doing much better when it comes to education levels, as more men have some secondary education, grade 12 and higher education than their female counterparts (Graph 4).



Graph 4: Education levels by gender for the TSantsabane Municipality.

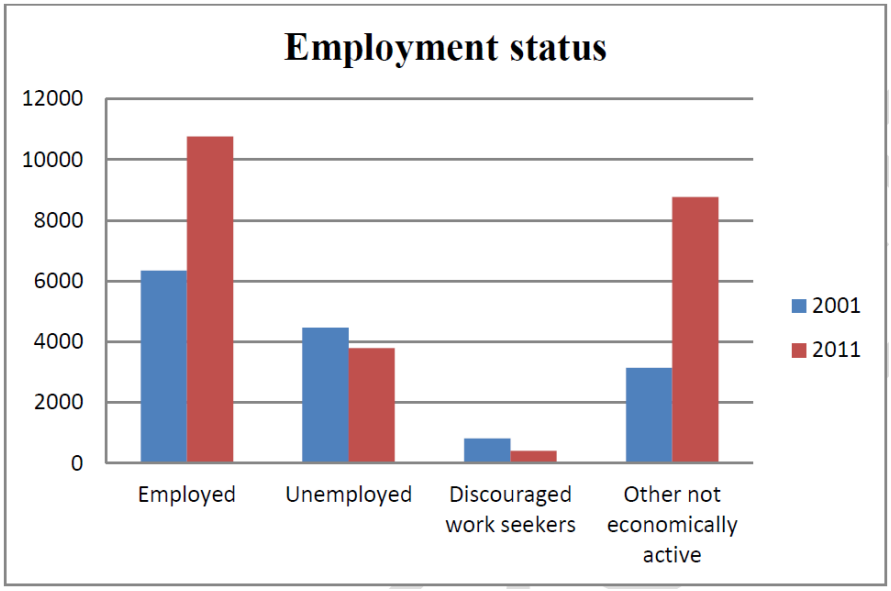
Employment

According to the STATSA unemployment figure for the Tsantsabane Municipality has drastically reduced from 4 466 in 2001 to 3 795 in 2011 this shows a decrease of 15%. Employment has increased by 69% in 2011, this clearly indicates that there are more people working in 2011 than in 2001.



Graph 5: Employment status indicated by gender for Tsantsabane.

There is more employed people in 2011 than in 2001 in the TSantsabane Municipality, however there is a very high level of economically inactive members in 2011 than it was in 2001. The high number of economically inactive could indicate a high level of dependency on those who are employed.



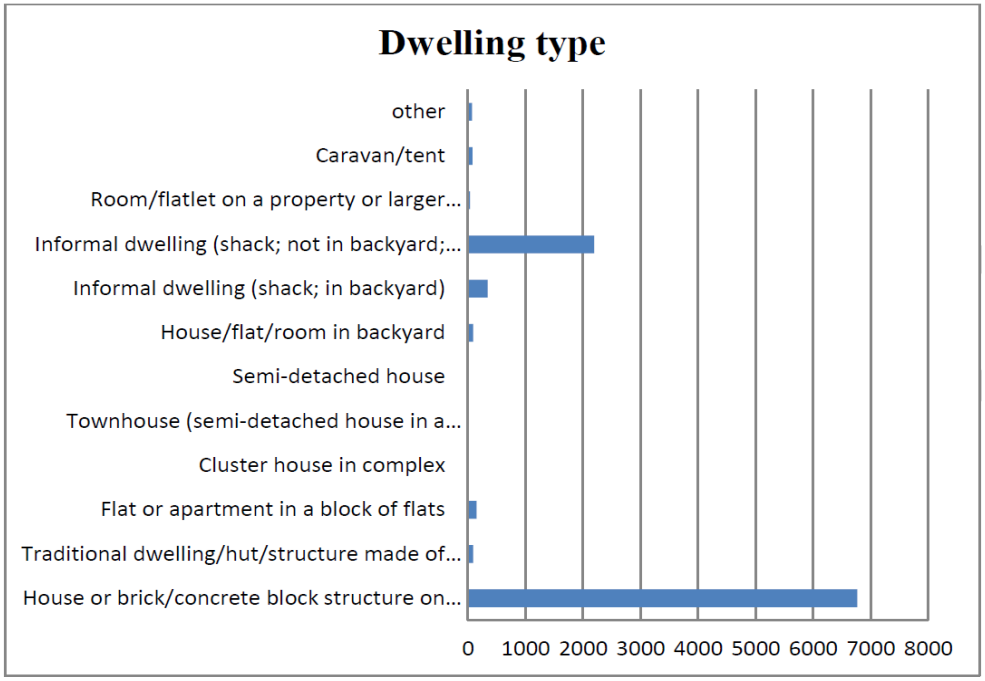
Graph 6: Employment Status for the Tsantsabane Municipality.

Housing

"Mining in Tsantsabane is the highest contributor to both its economic growth and job creation; the town has three new mines in the last 2 years. Tsantsabane is located 200km outside of Kimberley. Tsantsabane has three main traffic routes that provide access to other cities, namely Johannesburg via Kuruman and the Kalahari and Cape Town via Kimberley. More than 99,86% of the municipality is currently vacant/undeveloped. Tsantsabane has no traditional or tribal areas and 90% of the population resides in the urban areas while 10% of the population resides on farms.

Due to the increase in mining activities in the Tsantsabane Municipality, the demand for housing has also increased. There was a 2.7% population growth between 2001–2011. In 2011 over 26% of the population was unemployed and over 30% of the economically active population earned no income. Mining accounts for 55% of the GDP within the region. There are 9,839 households in Tsantsabane, with an average household size of 3.5 people. 72% of the residents live in formal dwellings. 67% of households use a flush toilet connected to sewerage and 45% have piped water inside. 57% receive weekly refuse removal. 59.6% of the houses have been fully paid off".

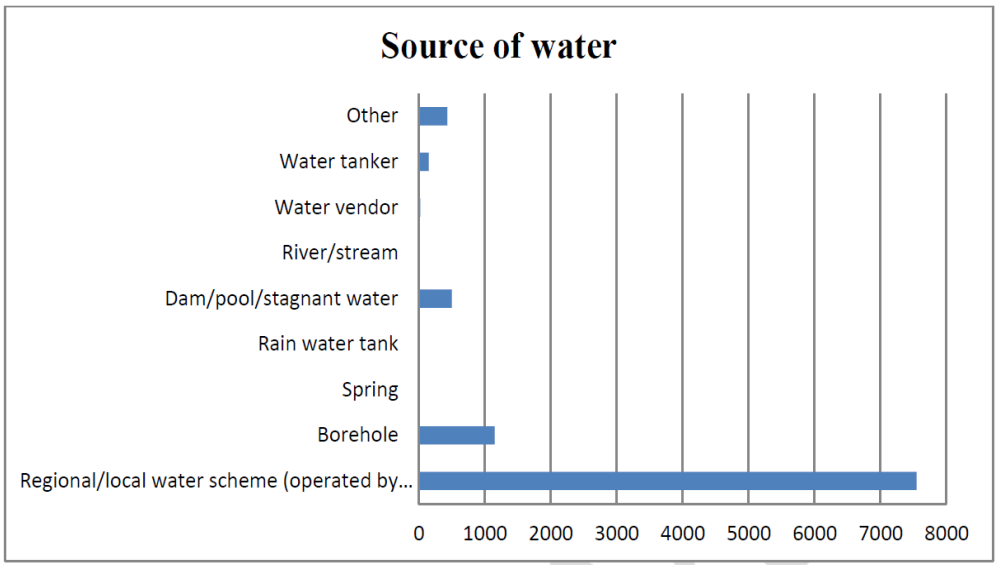
The majority of residents (6767 households) in the Tsantsabane Municipality reside in house or brick/concrete block structure houses, followed by those who live (21952 households) in informal dwelling (shack; not in backyard; e.g. in an informal/squatter settlement or on a farm). It is clear that the municipality needs to look at innovative ways to respond to the plight of people living in informal dwelling, which could be by means of in situation upgrade if the conditions allows for upgrade.



Graph 8: Dwelling types in the Tsantsabane Municipality.

Water

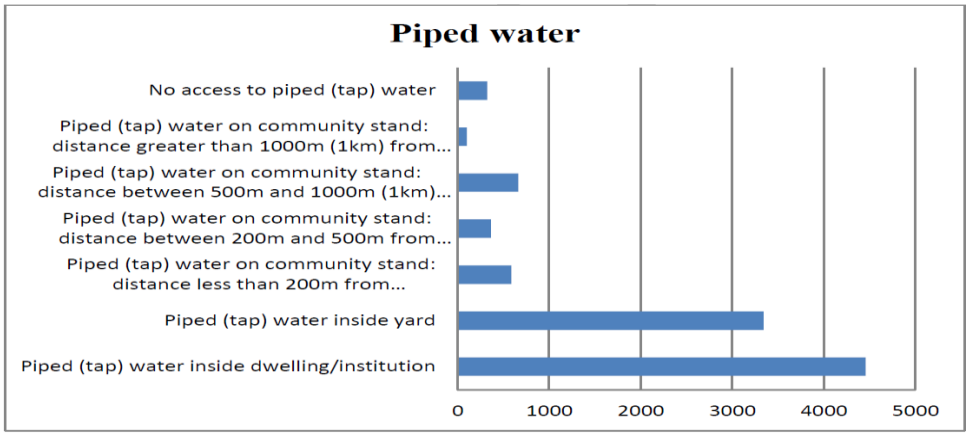
With regard to water provision in the Tsantsabane Municipality the percentage of households having access to pipe water inside their dwellings have also increased from 37.1% to 62% (2001 and 2011 period). The majority of Tsantsabane residents drink water that is from a water scheme. A small percentage drinks water from borehole. A concern is for those who drink water from dam/pool/stagnant water and other source as the water might not be safe to drink.



Graph 9: Sources of water for the Tsantsabane Municipality.

Access to Water

As stated previously, the percentage of total house holds which has access to pipe water inside their dwellings have increased from 37.1% to 62% from 2001 to 2011.

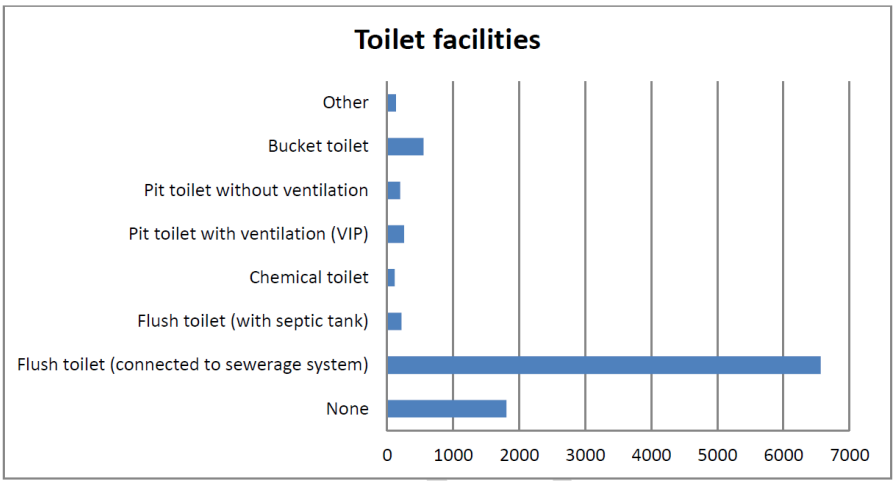


Graph 10: Access to piped water in the Tsantsabane Municipality.

Sanitation

The Millennium Development Goal states the need for "sustainable access to safe drinking water and basic sanitation".

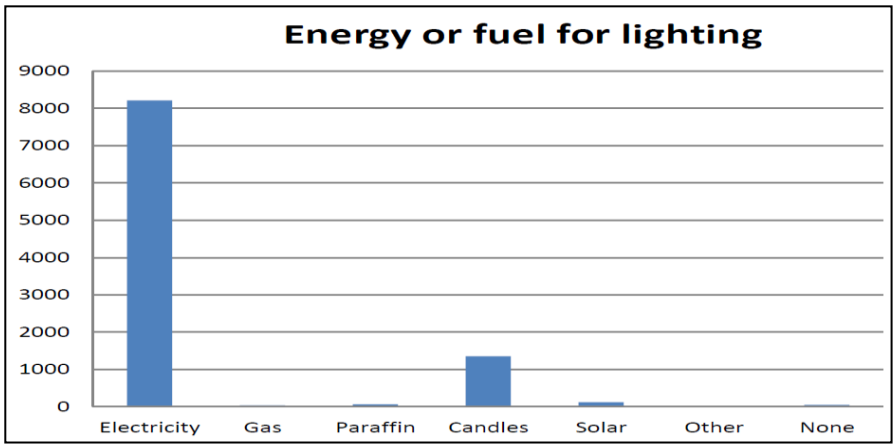
The Community Survey of 2007 for the Tsantsabane Municipality further indicates an improvement in sanitation and sewerage provision. However there are still 552 households that use buckets toilets. The majority of the residents (6563 households) use a flush toilet that is connected to a sewerage system.



Graph 11: Sanitation facilities for the Tsantsabane Municipality.

Electricity

There has been a general increase in the number of people having access to electricity, across the country. 2011 Stats SA indicates that 8211 households use electricity for lighting while 1356 households use candles in the Tsantsabane Municipality.



Graph 12: Sources of energy for the Tsantsabane

(14) ***SENSITIVE LANDSCAPES:***

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

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

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

The relevant specialists will be appointed to conduct specialist studies to assess whether there are any sensitive landscapes within the applicationa area.

(b) Description of the Current Land Use

(1) *Land Use before Prospecting / Mining:*

Land use within the broader study area mainly relates to farming activities. Farming practises consist mainly of cattle and game farming and to a lesser extent sheep and goats. Historically some areas have also been ploughed and irrigated, mainly for the cultivation of lucern, ranging in size between 2ha to 16ha on some farms that had high yielding boreholes. Apart from agricultural practices, mining forms the largest industrial activity in the area

If the prospecting operation proves positive the only other use in this area will be for prospecting / mining.

(2) Evidence of Disturbance:-

On the application area there are existing roads and an existing mining permit for SA Diatomite next to the application area.

(3) Existing Structures:-

The only structures on the application area is the existing roads and a store.
All 100m safety borders from infrastructure will be kept.

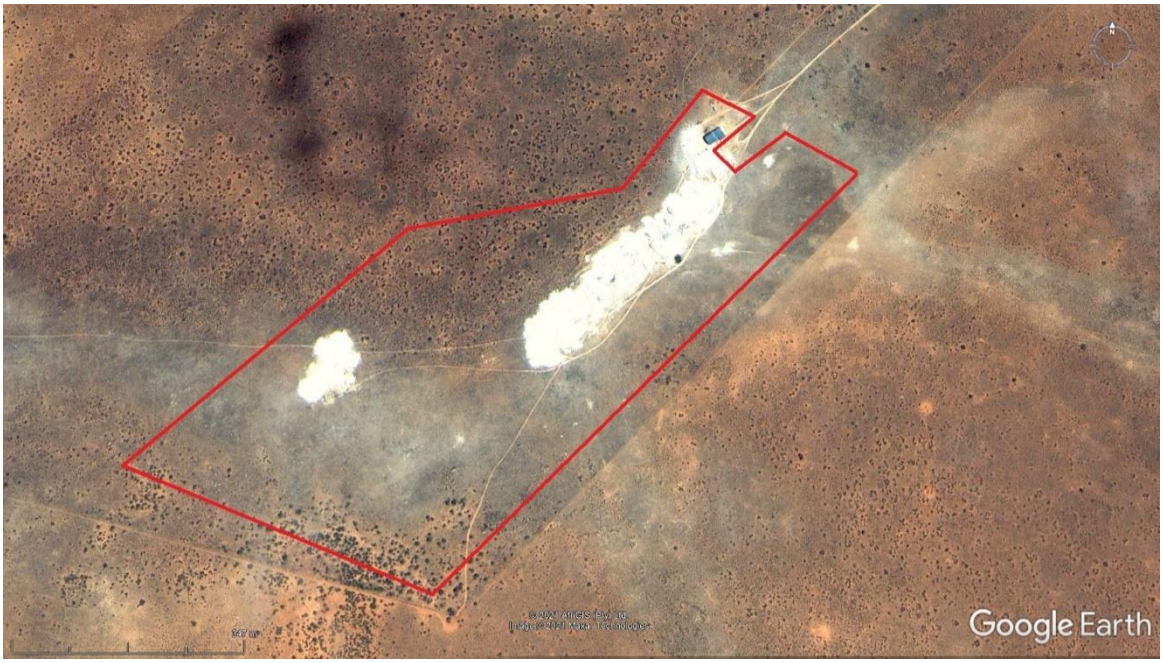


Figure 20. Satellite image of the application area

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

The infrastructure on site comprehensively discussed in section d(ii) as part of the Prospecting / Mining methodology discussion, as well as in section g as part of the mine footprint description. Furthermore, a comprehensive description of the environment was presented in section (i) as part of the baseline report.

(d) Environmental and current land use map (Show all environmental, and current land use features)

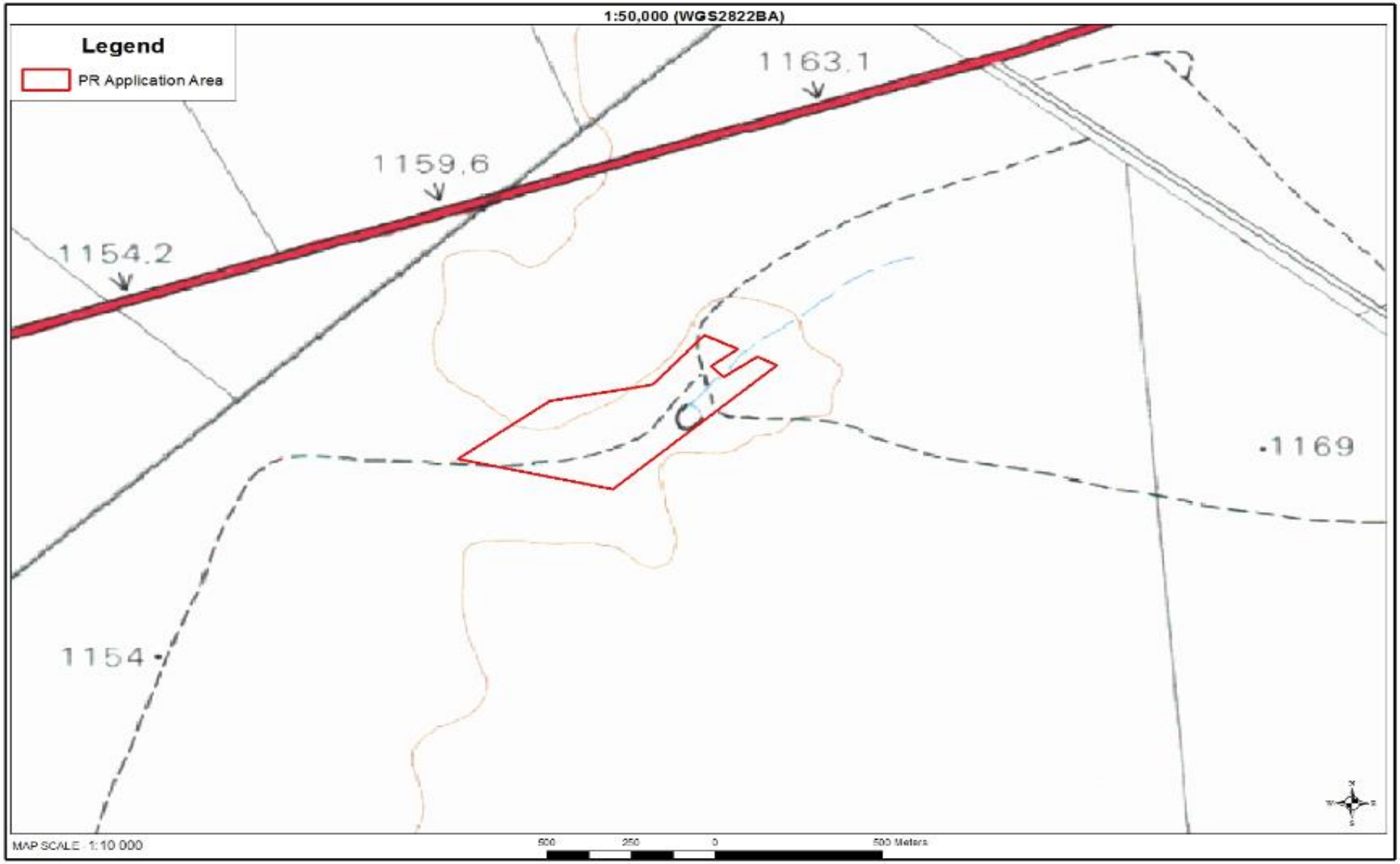


Figure 21. *Environmental and current land use map* on 1:50 000 topgraphical map

v) Impacts identified

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

Nature of Impact	Significance	Probability	Duration
Sterilisation of mineral resources.	Low	Highly unlikely	Decommissioning
Changes to surface topography due to topsoil removal, prospecting pits (bulk sampling), placement of infrastructure and development of residue deposits.	Low to medium	Certain	Permanent Post-closure
Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Low to medium	Possible	Long Term Life of prospecting operation
Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Low to medium	Possible	Short term
Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation of prospecting pits.	Low to medium	Possible	Short term
Pollution of underground water sources.	Low to medium	Possible	Long Term Life of operation
Deterioration of water resources through prospecting.	Low to medium	Possible	Long Term Life of operation
Deterioration in water quality through spillages and runoff from site.	Low to medium	Possible	Long Term Life of operation
The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function when bulk sampling.	Low to medium	Certain	Long Term Life of operation
Proliferation of alien invasive plants species.	Low	Possible	Long Term Residual
Displacement of faunal species.	Low	Possible	Long Term Life of operation
The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Low	Possible	Long Term life of prospecting operation
Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling	Low	Certain	Life of Operation Decommissioning

operations, wind erosion of stockpiles and vehicle entrainment of road dust.			
Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by means of increased noise and vibration.	Low to medium	Certain	Long Term Life of Operation
Visual impact of the mine infrastructure, slimes dams and stockpile; visibility of dust.	Low to medium	Certain	Life of Operation Decommissioning
Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low to medium	Possible	Life of Operation Decommissioning
The deterioration of sites of cultural and heritage importance.	Low	Possible	Life of Operation
Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during site closure.	Low to medium	Certain	Short-term and Closure
Loss of trust and a good standing relationship with the IAPs.	Low to medium	Possible	Life of Operation Decommissioning
Positive socio-economic impacts during operation, upliftment of previously disadvantaged communities.	Low to Medium	Certain	Life of Operation Decommissioning to residual

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

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

The limits were defined in relation to the Prospecting Characteristics. Those for probability, significance and duration are subjective, based on rule of thumb and experience. The significance of the impacts is defined as follows:

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

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. This is classified as follows:

- **Local**
  The impacted area extends only as far as the activity, e.g. a footprint.
- **Site**
  The impact could affect the whole, or a measurable portion of the property.
- **Regional**
  The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.

Duration
The lifetime of the impact which is measured in the context of the lifetime of the proposed phase (i.e. construction or operation).

- **Short term**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term**
  The impact will last up to the end of the prospecting period, where after it will be entirely negated.
- **Long term (Residual)**
  The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**
  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.

Intensity
This describes how destructive, or benign, the impact is. Does it destroy the impacted environment, alter its functioning, or slightly alter it. These are rated as:

- **Low**

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

- **Medium**
  The affected environment is altered, but function and process continue, albeit in a modified way.
- **High**
  Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

  This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

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. The classes are rated as follows:

- **Improbable**
  The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- **Probable**
  There is a possibility that the impact will occur to the extent that provisions must be made therefore.
- **Highly probable**
  It is most likely that the impacts will occur at some or other stage of the development.
- **Definite**
  The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact.

Determination of significance

Significance is determined through a synthesis of impact characteristics. 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. The classes are rated as follows:

- **No significance**
  The impact is not likely to be substantial and does not require any mitigatory action.
- **Low**
  The impact is of little importance, but may require limited mitigation.
- **Medium**
  The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
- **High**
  The impact is of great importance. Failure to mitigate, with the objective to reduce the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

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

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

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

During the construction and prospecting operation, there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusuable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

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

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

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. Vehicle traffic generates dust which can

reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present can be destroyed during the bulk sampling operation.

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

The transformation of natural habitats to prospecting and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to prospecting activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the temporary prospecting and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

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

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

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

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

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

It is difficult to predict the actual impact of the prospecting closure in advance, but it is acceptable to assume that the prospecting closure will have a negative impact on the local and regional economy with a high probability of occurrence, a medium severity due to small scale and a medium significance.

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

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

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

Geology and Mineral Resource

Level of risk: Low

Mitigation measures

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

Topography

Level of risk: Low to medium

Mitigation measures

- Prospecting with bulk sampling and rehabilitate material back up to natural ground level.
- Do controlled dumping.
- Employ effective rehabilitation strategies to restore surface topography of the area and plant site.
- Stabilise the bulk sampling sites.
- All temporary infrastructures will be demolished during closure.

Soil Erosion

Level of risk: Low to medium

Mitigation measures

- At no point may plant cover be removed within no-development zones.
- All attempts must be made to avoid exposure of dispersive soils.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- The prospecting operation must co-ordinate different prospecting activities in order to optimise the utilisation of the invasive prospecting and thereby prevent repeated and unnecessary activities.
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers.
- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Excavated and stockpiled soil material are to be stored and bermed on the higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Stockpiles susceptible to wind erosion are to be covered during windy periods.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- Rehabilitation of the erosion channels and gullies.
- Dust suppression must take place, without compromising the water balance of the area.
- Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.

Soil Pollution

Level of risk: Low to medium

Mitigation measures

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

Land Capability and Land Use

Level of risk: Low to medium

Mitigation measures

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities.
- Surface agreement to be signed with land owners.
- Employ effective rehabilitation strategies to restore land capability and land use potential of the area.
- All activities to be restricted within the demarcated areas.
- Ensure that land which is not used during construction is made available for grazing if possible.

Groundwater

Level of risk: Low tp medium

Mitigation measures

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

Surface Water

Level of risk: Low to medium

Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- Under no circumstances may ablutions occur outside the provided facilities.
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.
- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- At all times care should be taken not to contaminate surface water resources.
- Store all litter carefully to prevent it from washing away or blown into any of the drainage channels.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The prospecting area should be cleared daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution.

Indigenous Flora

Level of risk: Low to medium

Mitigation measures

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

All Invasive Plants

Level of risk: Low to medium

Mitigation measures

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

Fauna

Level of risk: Low

Mitigation measures

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

Habitat

Level of risk: Low

Mitigation measures

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

Air Quality

Level of risk: Low

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for bulk sampling only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- The length of time where prospecting areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed where possible.
- Dust suppression methods should, where logistically possible, be implemented at all areas that may/are exposed for long periods of time.
- For all prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and Vibration

Level of risk: Low to medium

Mitigation measures

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

Visual Impacts

Level of risk: Low to medium

Mitigation measures

- Infrastructure should be placed to optimise the natural screening capacity of the vegetation.
- Where practical, protect existing vegetation clumps in order to facilitate screening during the prospecting operations.
- Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the prospecting site free from additional unsightly elements.
- Dust suppression procedures should be implemented especially on windy days during earth works.
- Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species.
- Implement a management plan for the post-prospecting site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Traffic and Road Safety

Level of risk: Low to medium

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage Resources

Level of risk: Low to medium

Mitigation measures

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

Socio-Economic

Level of risk: Low to medium

Mitigation measures

- The mine must ensure that false expectations are not created regarding job creation.
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants.

- Contractors and employees should not be permitted to wander outside the prospecting area.
- Uncontrolled settlement of contractors and workers outside of the site will be prevented.
- The expectations of what benefits can accrue to the community must be managed from the initiation of the project.

Interested and Affected Parties

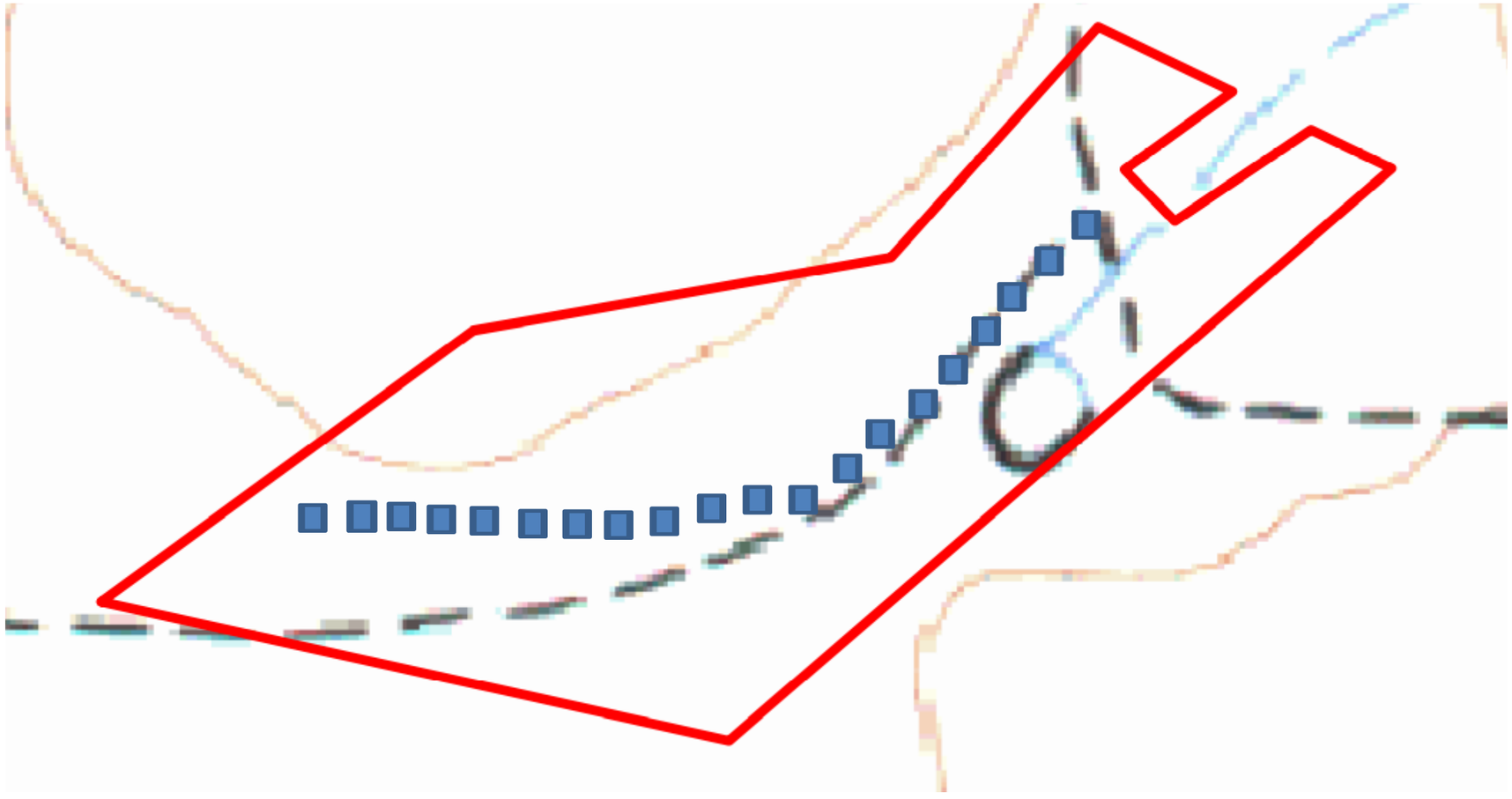
Level of risk: Low to medium

Mitigation measures

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

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

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



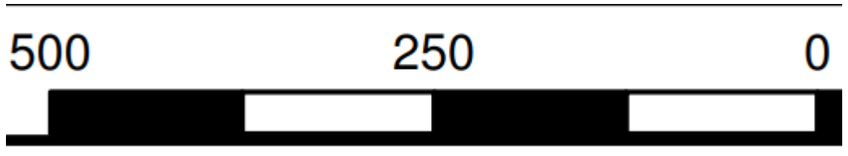


Figure 22. Final site layout plan with pits provisionally indicated in blue blocks (Pits not to scale) trenches will beplanned after pits have been done to establish target areas.

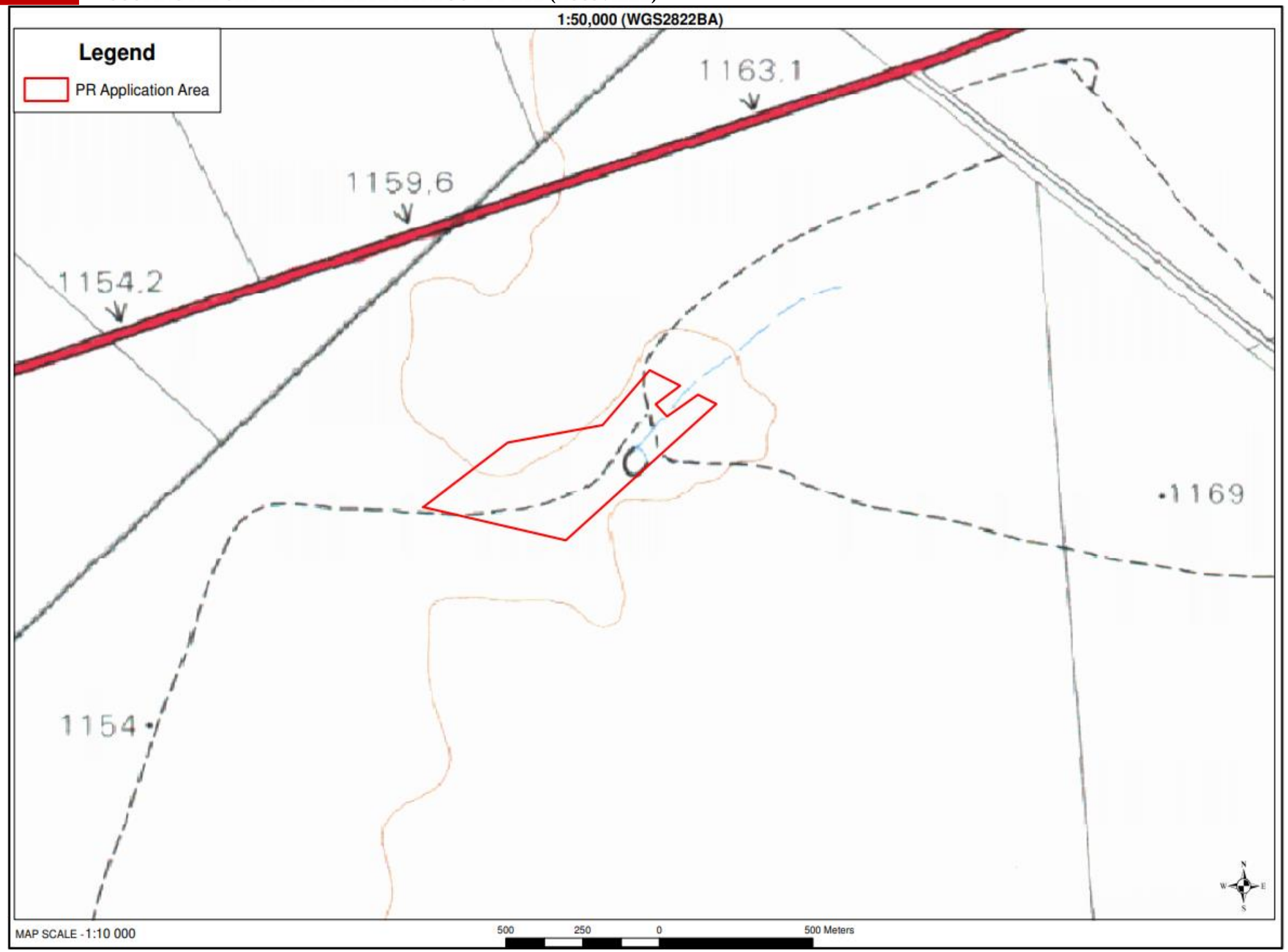


Figure 23. ***Final site layout plan***

x) Motivation where no alternative sites were considered

No alternative location for the proposed prospecting operation was considered, as the proposed kieselguhr deposits occur in this area. There is therefore no other alternative with regard to the overall operation footprint.

xi) Statement motivating the preferred site.

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

Not applicable. There is no alternative development location for the site as this is the area with the possible mineral resource.

i) Plan of study for the Environmental Impact Assessment Process

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

- Land use development alternatives:
  The site layout may vary, depending on the operational requirements. However the final design and layout of the infrastructure have been planned and decided upon by the developer on the grounds of reserves, and placement of infrastructure based on hauling distance, environmental features such as wind direction, heritage findings, protected species, and stormwater management on the mine.

- No-go option:
  The following positive impacts will be lost if the proposed prospecting project is not developed:
  - TAX and VAT obligations to SARS as well as Royalties;
  - CAPEX spent locally and regionally;
  - Employment opportunities;
  - Payroll income;
  - Operating expenditure and maintenance (OPEX);
  - Revenue.

Prospecting activities are believed to be the most economically beneficial option for the area as the prospecting activities indicated to be positive.

If the operation does not continue it would hold back any potential employment for Kuruman/ Olifantshoek and the families who are likely to benefit from the positive employment opportunities. Substantial tax benefits to the State and Local Government will also be inhibited.

Prospecting and Mining forms an integrated part of the social and economical growth of South Africa and more specifically the Northern Cape Province.

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

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

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

2. The stripping and stockpiling of topsoil.

3. Load and Haul Operation for the prospecting operation (bulk sampling).
   - Loading, hauling.

4. Altering the characteristics of surface water features.

5. The development of temporary stockpiles:
   - Topsoil storage area;

6. The rehabilitation of footprint areas where the bulk sampling sites have been excavated.

7. Loading, hauling and transporting of bulk sampling material.

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

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

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

i. Description of aspects to be assessed by specialists:

An Archaeologist and Palaeontologist have already done impact assessments on the farm for heritage and palaeontology sensitive areas. Also an Ecological study will be done and possibly a wetland delineation. All information will be used to identify areas that can be sensitive and to make the necessary provision to avoid these areas. Any other Specific specialist reports will be done when specifically requested by any Department or in interested and affected party consultation referred to.

ii. Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives:

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

The identification of potential impacts of the prospecting activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process. Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the prospecting activities include impacts on air quality, noise, fauna, flora, terrestrial ecology, heritage resources, socio-economy, visuals, storm water and erosion.

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed project enables sustainable prospecting, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, method and proceeding without the prospecting operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the prospecting operation will however not form part of this consideration, as the location of the prospecting site is determined by the possible geological location of the mineral resource.

iii. The proposed method of assessing duration significance:

The lifetime of the impact will be measured in the context of the lifetime of the proposed phase or activity.

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

- **Short term**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term**
  The impact will last up to the end of the prospecting period, where after it will be entirely negated.
- **Long term**
  The impact will continue or last for the entire operational life of the prospecting, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**
  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.

iv. The stages at which the Competent Authority will be consulted:

Consultation with the Competent Authority will take place throughout the application process, however more specifically; consultation will take place before submission of the Scoping Report and again before submission of the EIA/EMPR Report.

v. Particulars of the public participation process with regard to the Impact Assessment process that will conducted:

1. Steps to be taken to notify interested and affected parties:

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

The consultation process with interested and affected parties (neighbouring farmers and land owners) was completed for the Scoping Report that will be submitted and consisted of the process below.

The process as described by NEMA for Environmental Authorisation was followed. See table in Appendix 3 for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants were consulted.

An Advert (Notice) was placed in the Kathu Gazette to notify all other interested or affected parties to register on 05 February 2022.

The Scoping Report was put on disc and was distributed to all the registered parties per registered mail on 07 February 2022. The document will also be made available at the public library in Olifantshoek.

Proof of notification and consultation is attached as Appendix 3. The consultation process is ongoing.

2. Details of the engagement process to be followed:

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

The following procedures will be followed:

- The Scoping Report has been distrubited to all registered parites via registered mail on 07 February 2022.

- All other documentation (Scoping, EMP and EMPR) will be made available in public libraries.
- Records will be kept of the complaints and the mitigation measures implemented.

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

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

The following information will be provided to IAPs:

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

The following information will be requested from the IAPs:

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

vi. Description of the tasks that will be undertaken during the environmental impact assessment process:

Determining environmental attributes

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

Identification of impacts and risks

The identification of potential impacts of the prospecting activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process.

Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the prospecting activities include impacts on air quality, noise, fauna, flora, ground water, surface water, terrestrial ecology, heritage resources, socio-economy, visuals, stormwater and erosion.

Consideration of alternatives

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the prospecting project. In order to ensure that the proposed project enables sustainable prospecting, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, prospecting/ mining method and proceeding without the prospecting operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility.

Alternatives for the locality of the prospecting operation will however not form part of this consideration, as the location of the prospecting site is determined by the geological location of the proposed mineral resource.

Process to assess and rank impacts

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

Table 8: Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Very Low	<20% sure of particular fact or likelihood of impact occurring
2	Low	20 – 39% sure of particular fact or likelihood of impact occurring
3	Moderate	40 – 59% sure of particular fact or likelihood of impact occurring
4	High	60 – 79% sure of particular fact or likelihood of impact occurring
5	Very High	80 – 99% sure of particular fact or likelihood of impact occurring
6	Definite	100% sure of particular fact or likelihood of impact occurring

Table 9: Explanation of EXTENT of impact

Weight	Extent of Impact	Explanation of Extent
1	Site Specific	Direct and Indirect impacts limited to **site** of impact only
2	Surrounding Area	Direct and Indirect impacts affecting environmental elements within **2 km of site**
3	Local Municipality	Direct and Indirect impacts affecting environmental elements within the **Olifantshoek area**
4	Regional/District	Direct and Indirect impacts affecting environmental elements within **Kuruman District**
5	Provincial	Direct and Indirect impacts affecting environmental elements in the **Northern Cape Province**

Table 10: Explanation of DURATION of impact

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

Table 11: Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
3	Low	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
4	Moderately Severe	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
5	High Severance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
6	Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

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

(Severity + Extent + Duration) x Probability weighting

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

Table 12

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

Significance of impacts is defined as follows:

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

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

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

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

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

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

Very High - Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

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

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

	• Surface water contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Maintenance of generator and bund walls • Noise control and monitoring • Oil traps • Groundwater quality monitoring • Immediately clean hydrocarbon spill	
Office – Pre-fabricated office blocks on concrete	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Low
Parking bay	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Roads	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Maintenance of roads • Dust control and monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Salvage yard	• Possible Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Access control • Maintenance of fence. • Stormwater run-off control • Immediately clean hydrocarbon spill	Low
Stockpile area	• Dust	• Dust control and monitoring	Low

	• Possible Groundwater contamination • Surfacewater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Topsoil storage area	• Dust • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil disturbance • Surface disturbance	• Dust control and monitoring • Stormwater run-off control. • Continuous rehabilitation • Rip disturbed areas to allow re-growth of vegetation cover • Backfilling of topsoil during rehabilitation	Low
Waste disposal site	• Groundwater contamination • Surface water contamination	• Storage of waste within receptacles • Storage of hazardous waste on concrete floor with bund wall • Removal of waste on regular intervals.	Low
Washbay	• Possible Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination	• Groundwater quality and level monitoring • Concrete floor with oil/water separator • Stormwater run-off control • Immediately clean hydrocarbon spills	Low
Water tank with filter system: It is anticipated that the operation will establish 1 x 10 000 litre water tanks for potable water.	• Surface disturbance	• Monitor water quality and quantity • Maintenance of tanks (check for leaks).	Low

viii. Other information required by the Competent Authority:

1. Compliance with the provisions of Sections 24(4)(a) and (b) read with Section 24(3)(a) and (7) of the National Environmental Management Act (Act 107 of 1998), the EIA report must include the:-

a. Impact on the socio-economic conditions of any directly affected person:

(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected parson including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix '7' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

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

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

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

(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in Section 3(2) of the National Heritage Resources Act, 1999 (Act 25 of 1999) with the exception of the national estate contemplated in Section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix '8' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

Dr. E. Matenga was appointed to conduct a Heritage Impact Assesment for the prospecting right application. The study includes information gathered from a desktop study as well as from a site inspection conducted on 5 July 2021 (Study appended as Appendix 4).

General observations

A thick cover of grass impaired ground visibility. Barring this constraint, over a long period of time the windblown Kalahari sands would tend to cover surface scatters of artefacts.

The Stone Age

No Stone Age tools were found.

The Early Iron Age

No sites dating to the Iron Age were found.

The Later Iron Age

No sites of the Later Iron Age period were found.

Burial grounds

There are no burial grounds on the property.

CONCLUSION AND RECOMMENDATIONS

In light of these findings, it is recommended that the mineral prospecting can go ahead. As a standard precaution, archaeological deposits are usually buried underground. Should archaeological artefacts or skeletal material be exposed in the area during construction, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

Palaeontological

Prof Marion Bamford was appointed to conduct a desktop Palaeontological Impact Assesment for the prospecting right application. (Study appended as Appendix 5).

Palaeontological context

The Kathu Complex includes the excavated sites of Kathu Pan1 (KP1), Kathu Townlands and Bestwood 1 (BW 1). At Kathu Pan, evidence of early hominin occupation has been observed at multiple locations within the pan, but ESA deposits have only been excavated at KP 1. Stratum 4a at KP1 was dated by a combination of OSL and ESR/U-series to ca. 500 k BP. The lithic assemblage from St. 4a is characterized by a prepared core technology that produced both blades and points, and has been attributed to the Fauresmith industry. The lithic assemblage of the underlying St. 4b at Kathu Pan 1 is characterized by well-made handaxes, some bones and other tools (Beaumont, 2004; Walker et al., 2014; Lukich et al., 2020).

Palaeo-pans and palaeo-springs are visible in satellite imagery because of their topography and often are associated with lunette dunes. Vegetation changes are also common. No such features are seen in the Google Earth images. Aeolian sediments that cover most of the region, do not preserve fossils because they have been reworked and windblown.

Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the quartzites, sandstones, shales and sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material. The loose sands of the Tertiary and Quaternary period would not preserve fossils. Only palaeo-pans or palaeo-springs could preserve fossils but no such feature is evident.

Recommendation

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Quaternary aeolian sands. There is a very small chance that fossils may occur in pans or springs but none is evident. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once drilling or excavations for prospecting have

commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.

The site for prospecting lies on the ancient and non-fossiliferous strata of the Olifantshoek Supergroup, and the Quaternary aeolian sands that are potentially fossiliferous. Fossils could be found in palaeo-spring and palaeo-pan sites but none is visible from the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found once drilling or excavations for the prospecting activities have commenced.

Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

ix. Other matters required in terms of Sections 24(4)(a) and (b) of the Act:

(The EAP managing the application must provide the Competent Authority with details, written proof of an investigation as required by Section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix '9'.)

As mentioned before, the specific occurrence of possible kieselguhr resource in the area dictates the selection of the specific prospecting site and there are no alternatives in terms of project location.

The prospecting operation will provide ±10 jobs and will also add to the increased economic activity and the area surrounding the farm.

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

x. Undertaking regarding correctness of information:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

Signature of EAP
Date: 7 February 2022

xi. Undertaking regarding level of agreement:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of EAP
Date: 7 February 2022

- END –