mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: **NORTHERN SPARK TRADING 428 (PTY) LTD**
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FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/1/2/13215 PR**

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act, 2002 (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, 1998 (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.

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—

  (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

  (ii) degree to which these impacts—

    (aa) can be reserved;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be avoided, managed or mitigated.

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3. 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, 8301**
Postal Address:	**P.O. Box 110823, Hadisonpark, 8306**

ii) Appointed by:

Northern Spark Trading 428 (Pty) Ltd

iii) Expertise of the EAP

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

Registered as an Environmental Assessment Practitioner: Number 2019/1467 (EAPASA)
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:	REMAINING EXTENT OF THE **FARM BRAKFONTEIN 276,** Hopetown IN EXTENT: 2 145.8123 HA
Application area (Ha)	2 145.8123 ha (Two thousand one hundred and forty-five comma eight one two three hectares.)
Magisterial district:	**HOPETOWN,** Northern Cape Province
Distance and direction from nearest town	Brakfontein is situated approximately 66km southwest of Douglas which, in turn, lies 110km southwest of Kimberley, the administrative capital of the Northern Cape Province and the historic centre of the South African diamond mining industry. The Brakfontein property is located 5 – 6 km from the south bank of the Orange River in the Hopetown district of the Northern Cape Province.
21 digit Surveyor General Code for each farm portion	C03300000000027600000

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

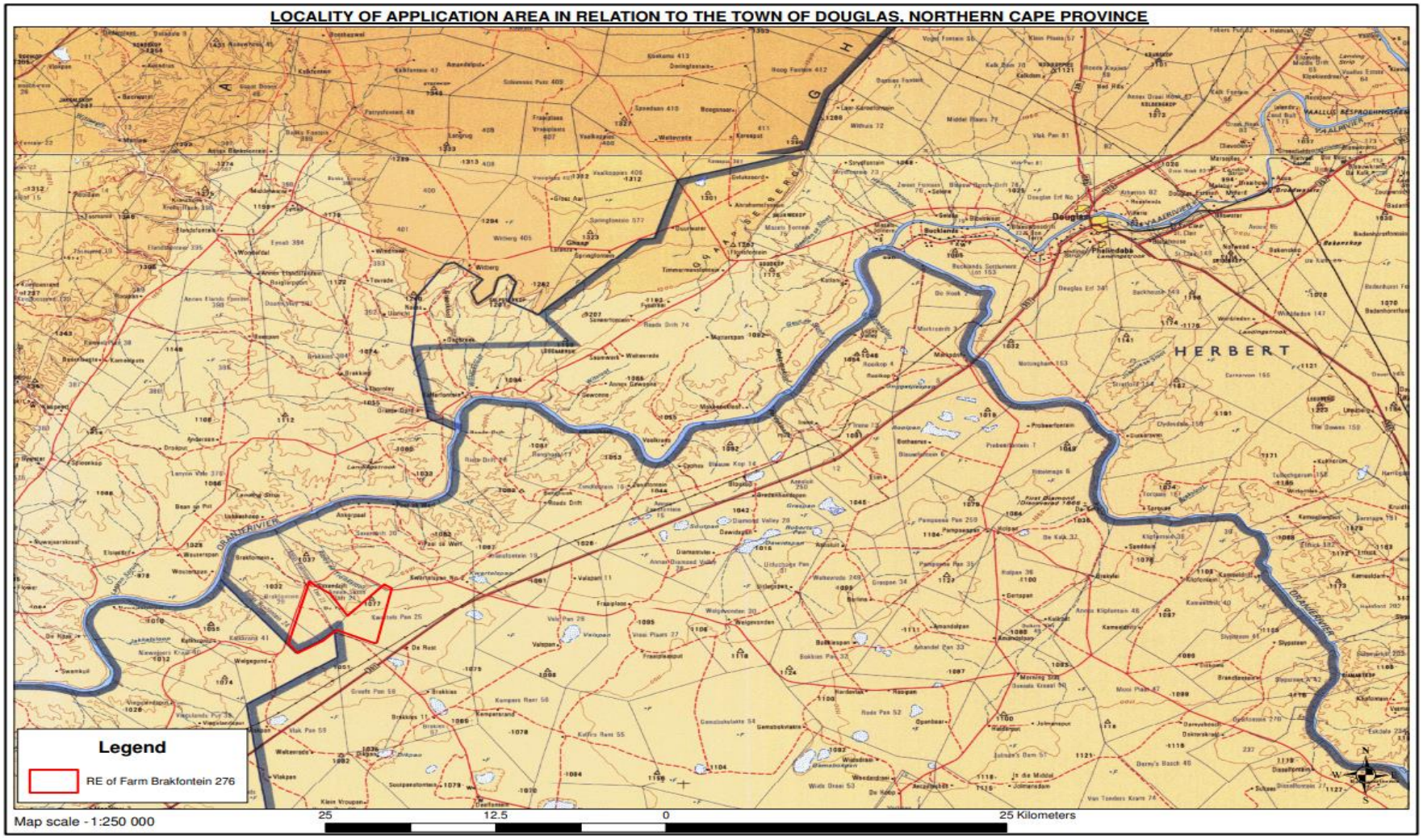


Figure 1. Locality Map 1: 250 000 indicating the application area in RED.

d) Description of the scope of the proposed overall activity

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

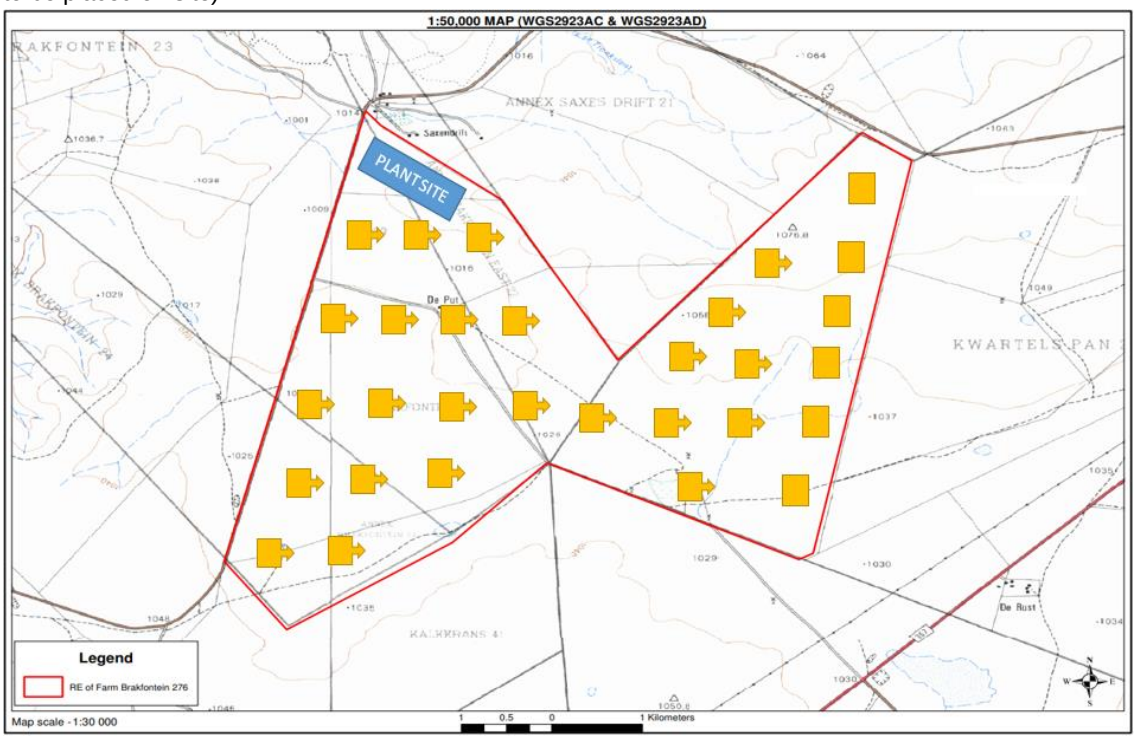


Figure 2. The proposed trench area for prospecting activities on Brakfontein.

The prospecting operation is primarily based on alluvial diamond deposits that are restricted to the paleo terraces of the Orange River (Figure 2). The deposits will be sampled by means of pitting and trenching (including bulk sampling) using a phased approached. Approximately 100 pits (2 m x 3 m x 0.5 - 5 m each) and 30 trenches (100 m x 50 m x 0.5 - 5 m each) will be created for bulk sampling. This will be performed by means of an opencast method using heavy earthmoving machinery. Vegetated soil or overburden will be stripped, and the underlying gravels will be excavated, screened, and treated through a rotary plan plant before fed to a sorting plant for final recovery. The rough diamond product will then be removed for further beneficiation. No gravel processing reagents are required or used in the treatment of the alluvial gravels. An estimated total volume of 1 200 m3 and 300 000 m3 for pitting and trenching will be processed, respectively over 5 years. Prospecting activities will make use of existing roads where possible, but haul roads will also be created to access the prospecting areas. Supporting infrastructure include temporary office, workshop and ablution facilities with chemical toilets, storm water control berms, water tanks, fuel storage facility, wash bay, salvage yard, waste disposal site, a central processing plant and pipeline infrastructure.

i) Listed and specified activities

Table 1: Listed and Specified Activities

NAME OF ACTIVITY **e.g.** **for prospecting –** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route, etc…etc…etc. **e.g.** **for mining –** 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 (*GNR 544, GNR 545 or GNR 546)/NOT LISTED***
Activity 20 of Listing Notice 1 Any activity including the operations 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, (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reductio, refining, calcining or gasification of a mineral resource in which case activity 6 in listing notice 2 applies.	2 145.8123 ha application lodged for the farm	X	GNR 327 Listing Notice 1
Activity 19 of Listing Notice 2 The removal and disposal of minerals contemplated in terms of Section 20 of the Minerals 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;	2 145.8123 ha application lodged for the farm	X	GNR 325 Listing Notice 2

but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of a mineral resource in which case activity 6 in listing notice 2 applies.			
Activity 24(ii) of NEMA Listing Notice 1 The development of a road- (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	±2 500 m² on the Area.	X	GNR327 Listing Notice 1
Activity 56(ii) of NEMA Listing Notice 1 The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur	±2 500m² on the Area.	X	GNR327 Listing Notice 1
Activity 15 of NEMA Listing Notice 2 The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of vegetation is required for – (i) The undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintanance mangement plan.	Pits+Trenches COMBINED is ±20 ha	X	GNR 325 Listing Notice 2
Activity 10 of NEMA Listing Notice 3 The development of infrastructure for the storage and handling of dangerous goods (fuel), in containers with a combined capacity of between 30 and 80 m3.	± 80 m³	X	GNR 324 Listing Notice 3
Activity 15 of Category A under the National Environmental Management: Waste Act 59 of 2008	Residue stockpiles or residue deposits		GNR 633

The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a Prospecting Right.	The continuous prospecting and stockpiling of topsoil, overburden and gravel 0.05 ha		
OTHER ACTIVITIES (Associated infrastructure not considered to be listed activities) Temporary Workshop Facilities Ablution Facilities	 ±0.04 ha ±9m²		Not Listed
A water pipeline of unknown length but less than 1000m	1000m		Not Listed
Pipelines for the bulk transportation of water with a diameter of < 0.36 m and a peak throughput of < 120 L /s.	To be confirmed		Not Listed
Pipelines for the bulk transportation of slimes with a diameter of < 0.36 m and a peak throughput of < 120 L/s.	To be confirmed		Not Listed
Pipelines for the bulk transportation of return water with a diameter of < 0.36 m and a peak throughput of < 120 L/s.	To be confirmed		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 include 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.

e) Policy and Legislative Context

Table 2:

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	- Control measures are to be implemented upon the approval of the EMPR.

	conjunction with the environmental legal provisions relevant to protection of flora.	
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) 30/5/1/1/2/13215 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)	- Control measures are to be implemented upon the approval of the EMPR.

	- 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) - 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	- A permit application regarding protected plant species needs to be lodged with DENC if any protected species is encountered. Control measures are to be implemented upon the approval of the EMPR.

	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 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 of 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	- Chapter 2 lists all protected areas.	- The proposed prospecting site falls within critical biodiversity areas, as defined by the Northern Cape Critical Biodiversity Areas Map

areas that are representative of South Africa's natural biodiversity and its landscapes and seascapes.		(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.
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) - 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)	- To be implemented upon the approval of the EMPR.

	- 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 needs 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 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.	- Control measures are to be implemented upon the approval of the EMPR. - Fossil finds procedure will be attached to the PIA.

	- 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; - 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))	- 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 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 be implemented upon the approval of the EMPR.

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

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

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

To ensure that the proposed development enables sustainable development, several 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).

A Prospecting Right application was lodged to identify the preferred areas on the property. The prospecting will be done with pitting, trenches and bulk sampling which will indicated if there are areas on the property that can be viably mined with grade and quality determined with the bulk samples taken off the property.

Prospecting Site Location

A Prospecting Right application was lodged to identify the preferred areas on the property. The prospecting will be done with pitting, trenches and bulk sampling which will indicated if there are areas on the property that can be viably mined with grade and quality determined with the bulk samples taken off the property.

Prospecting infrastructure will be placed strategic by incorporating prospecting project demands, environmental sensitivities, and IAP concerns, as identified during EIA process. Thus, the prospecting site location is primarily based on proximity to the access roads, proximity to the areas earmarked for prospecting and limited additional impact on the

environment and heritage resource. This renders the consideration of further alternative location in terms of the prospecting site location other than the prospecting residue deposits unnecessary.

The prospecting method of pitting and open trenches with continued backfilling is the only economic viable method currently being used by the alluvial diamond fraternity; it is also the only cost-effective method. There is no alternative prospecting method.

i) Details of the development footprint alternatives considered

With reference to the site plan provided as Figure 2 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 property on which or location where it is proposed to undertake the activity:

REMAINING EXTENT OF THE FARM BRAKFONTEIN 276, Hopetown

IN EXTENT: 2 145.8123 HA

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 bulk sampling with concurrent rehabilitation where possible will minimise footprint and impact. Any alternative methodology may have greater impact.

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

(a) 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. To ensure that the proposed development enables sustainable development, several 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

The Brakfontein site is situated in a rural area, with major land uses in the region including mining and agriculture. According to AGIS, the land capability for the study site is primarily non-arable but is suitable for grazing. The agricultural region is demarcated for sheep farming, with the grazing capacity estimated at 32 Ha/LSU. Currently, the property is primarily used for grazing by livestock and wildlife. Existing infrastructure includes old homesteads, farm tracks and grazing camps.

It would however be feasible to determine if there are 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. There will be infield screening to ensure that all oversize material is deposited back into the pits and trenches. This material should be covered with the overburden (where available), and topsoil that has been previously put aside for this purpose. The post-prospecting land use should be determined so that the developments strategies of the farm can continue beyond the prospecting of the area should the area be viable for mining.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

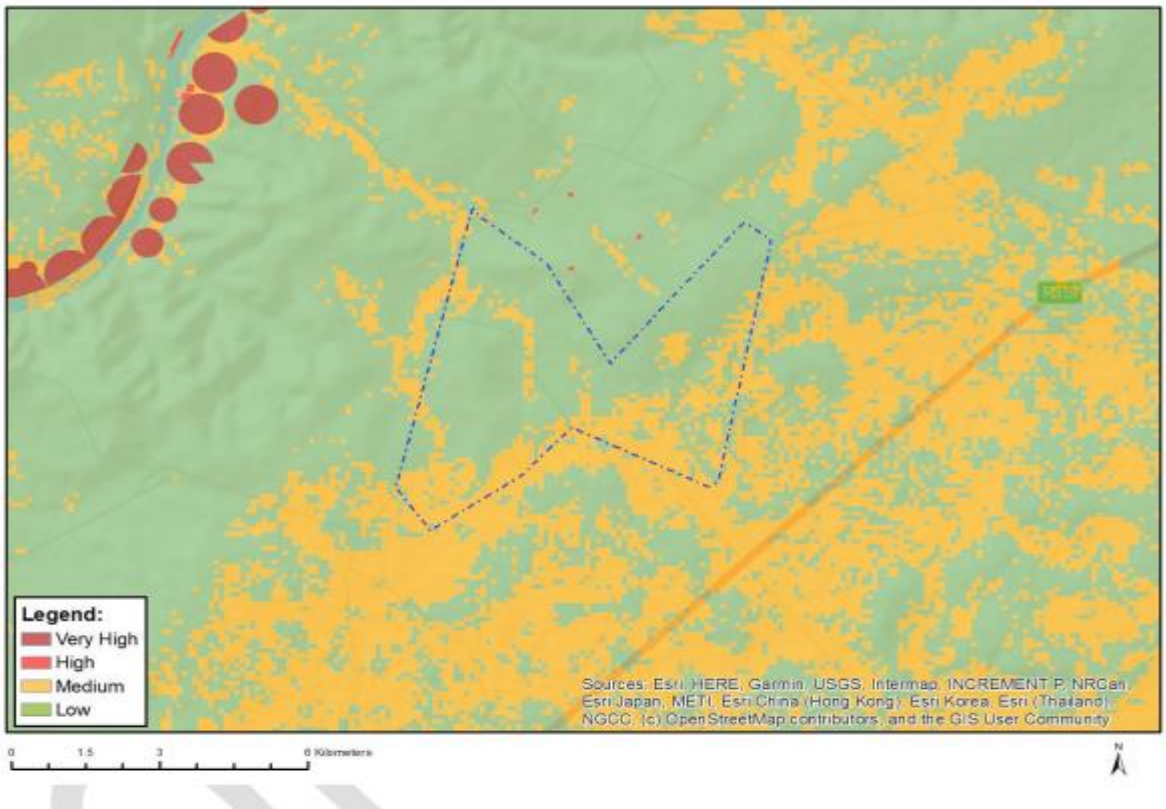


Figure 3. Map of Relative Agriculture Theme Sensitivity for Brakfontein 276

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		x	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

Project Infrastructure

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

Prospecting Method

The Prospecting method of open pits and trenches with continued backfilling is the only economic viable method currently being used by the diamond fraternity. There is no other alternative prospecting method for the prospecting of diamonds.

Proceed without the Mine (no go)

Socio-Economy

The operation will make provision for 15 - 25 job opportunities depending on the phase of the prospecting work programme. This will be lost if the project does not proceed. Substantial tax benefits to the state and local government will also be lost.

Biodiversity

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.

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

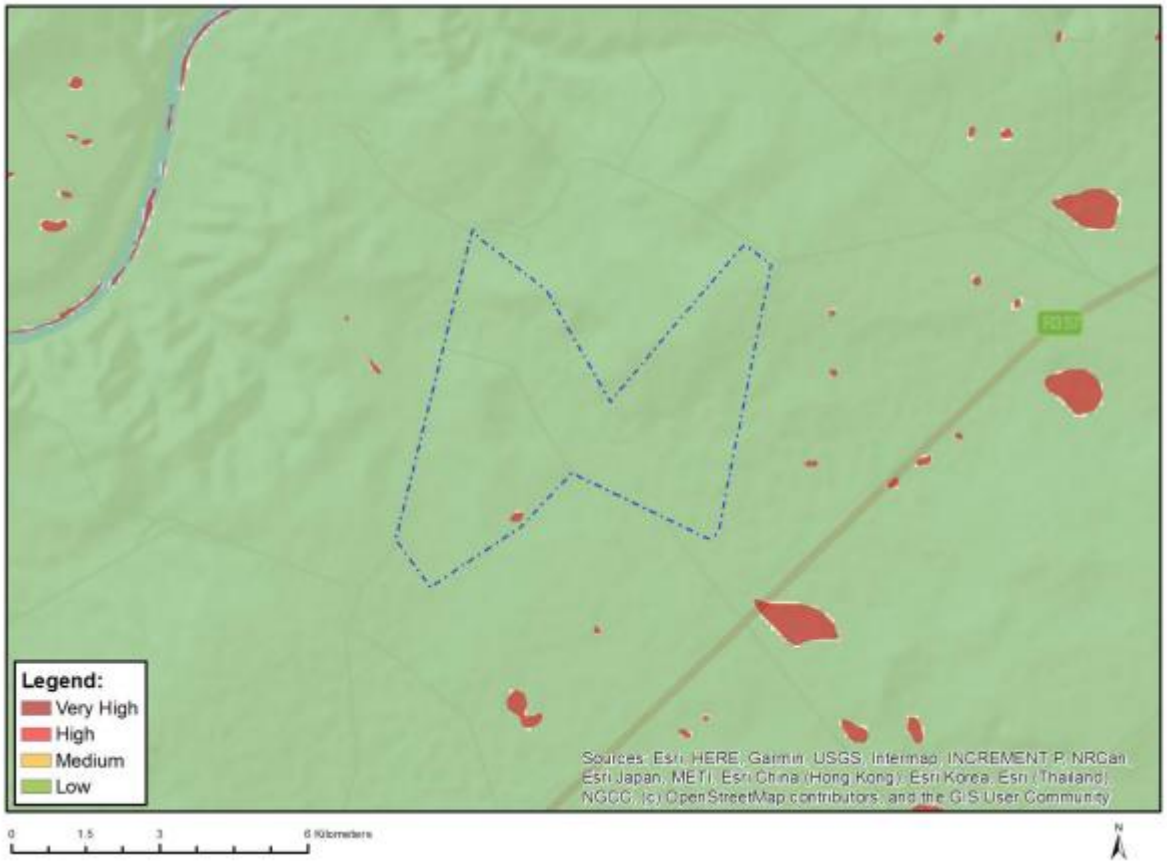


Figure 4. Map of relative Aquatic Biodiversity theme sensitivity

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

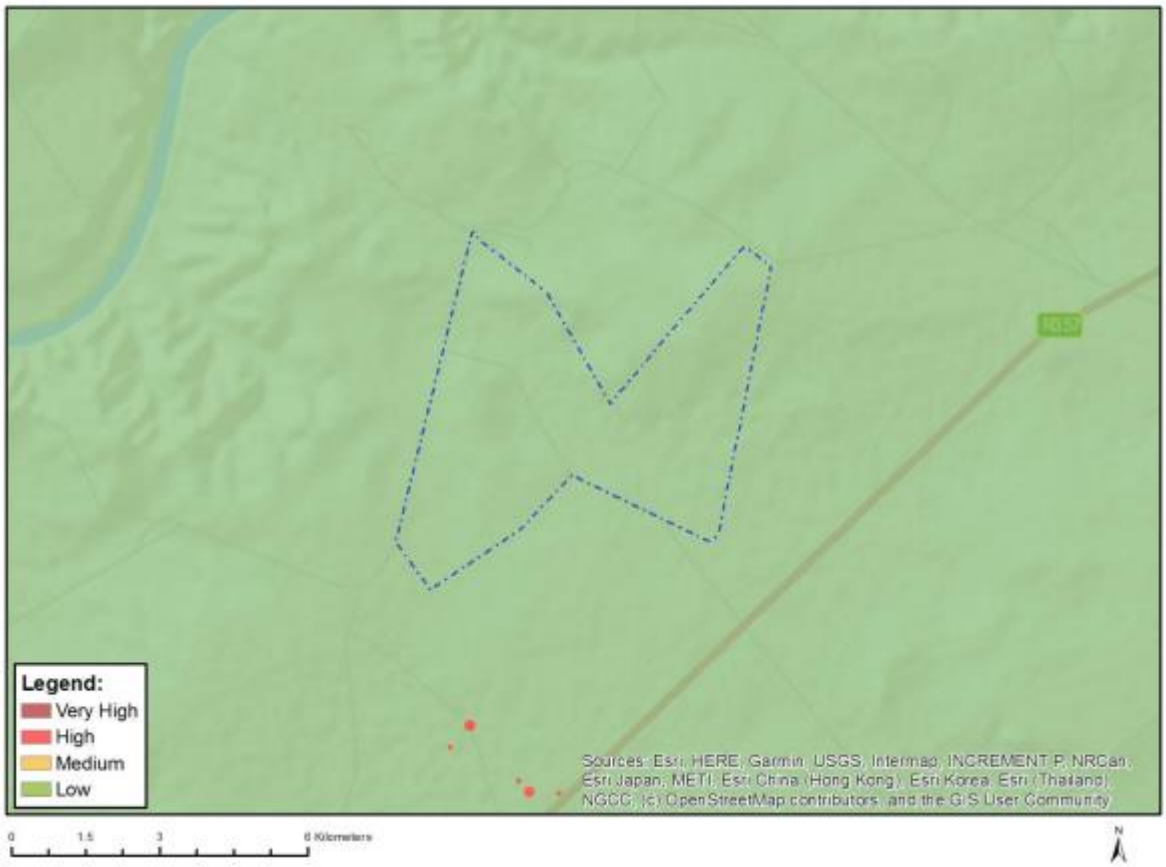
Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	Wetlands and Estuaries

Heritage and Cultural Resources

If the prospecting operation does not proceed, the heritage resources will remain as is. The protection and preservation of these resources are therefore not guaranteed. However, if the prospecting operation is approved, the heritage resources will be protected through the demarcation of no-go zones and fencing off if any of these resources are encountered.

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

Figure 5. Map of relative Archaeological and cultural Heritage Theme sensitivity

(d) 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-perennial drainage lines and wind direction), heritage resources and discussions with the relevant surface owners.

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

- Processing Plant: 2 X 16 feet

- 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):
  It is anticipated that the operation will utilize 2 x 23 000 litre diesel tank. This tank must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tank. A concrete floor must be established where the re-fuelling will take place.

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

- Roads (both access and haulage road on the mine site):
  Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 1.5 km of roads, with a width of 8 meters where no reserve exists and where the reserve exists 15 meters. The current access road is deemed adequate for a service road into the prospecting site.

- Salvage yard (Storage and laydown area).

- Product Stockpile area.

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

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

- Temporary Workshop Facilities and Wash Bay.

- Water distribution Pipeline.

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

Alternatives considered: -

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

In terms of water use alternatives, the operation is located about 5 km away from the Orange River which are a perennial river as the best water source for the operation. Plastic pipelines are the best long-term option for transferring water, due to their temporary nature which causes minimum environmental disturbances.

If prospecting proves positive a diamond rotary plant will be established or a BV machine as alternative to extract the diamonds. A BV machine will use much less water.

Therefore, a pipeline route will be designed based on the principle of minimum impacts to the environment from the Orange River for water use for the rotary pan plant or BV.

The locality of the mine residue dam will be selected based on the following considerations, this dam will be very small due to the limited material being processed and the limited water needed:

- The locality is already disturbed or mined out.
- It is within reach of (1 000m) of the treatment plant.
- It is situated near the access road to the prospecting activities.
- No underlying ore bodies or geological discontinuities.
- No geomorphological impacts.
- No structures, dwellings, or other points of risk on down-stream side.
- Convenient material nearby for construction of dam.
- Topsoil from the treatment process will be available for final rehabilitation.

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

In terms of power generation, the options available was for Generators or ESKOM power. All 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.

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

- Technique

The area will be excavated (opencast method) with an excavator up to bedrock, stockpiled next to an open area and loaded onto the trucks by a frond end loader. The trucks will transport the gravel via a newly constructed road, which will be constructed to the required safety standard. No provincial roads will be used.

At the processing plant the run of mine tailings will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening process and transported for delivery to a recovery plant and associated equipment.

- Technology

At the processing plant the run of mine tailings will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening process and transported for delivery to a recovery plant and associated equipment.

Alternatives considered: -

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

(f) The operational aspects of the activity:

The gravels will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the bulk sample gravels will be fed onto a grizzly for screening out oversize material. The tailings will be processed through a screening section and transported for delivery to a recovery plant. Concentrate from the recovery plant will be processed through an X-Ray/Sortex plant or BV to extract possible diamonds.

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 diamond fraternity. There is no other feasible, alternative bulk sampling method for the prospecting and extraction of possible general and alluvial diamonds.

(g) The option of not implementing the activity:

The Brakfontein site is situated in a rural area, with major land uses in the region including mining and agriculture. According to AGIS, the land capability for the study site is primarily non-arable but is suitable for grazing. The agricultural region is demarcated for sheep farming, with the grazing capacity estimated at 32 Ha/LSU. Currently, the property is primarily used for grazing by livestock and wildlife. Existing infrastructure includes old homesteads, farm tracks and grazing camps.

Potential land use includes grazing and prospecting. The majority of the area is classified to have potential for grazing. Therefore, prospecting activities are believed to be one of the economically beneficial options for the area to establish any potential for mineral resources.

Socio-Economy

The operation will make provision for 15 - 25 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

In terms of the Screening tool Brakfontein falls into an Ecological Support Areas in the west of the application area. An Ecological study has been conducted and included into the EIA EMP document.

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Figure 6. Map of relative terrestrial biodiversity theme sensitivity for Brakfontein taken of the Sceening Tool.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Ecological support area

Heritage and Cultural Resources

The following information is taken out of the Heritage Impact Assessment done by Dr. Edward Matenga from AHSA Archaeological and Heritage Services Africa (Pty) Ltd. (Appendix 5)

The heritage sensitivity of the property is summarised as follows:

The Stone Age

As a general observation, Stone Age material occurs in the Middle Orange River Valley as background scatters which are testimony to the foraging activities of stone age communities. This pattern was observed on the Farm Brakfontein 276

(Remaining Extent) where eight (8) out of 12 occurrences recorded were lithics. There was an occasional hand-axe (Site BKN12) probably dating to the transition from the Early Stone Age to the Middle Stone Age. Otherwise, the scrapers and blades, commonly encountered date to the Middle Stone Age/Late Stone Age period. None of the sites recorded warrant further action.

The Early Iron Age

No material dating to the Iron Age was found.

The Later Iron Age

No material dating to the Later Iron Age was found.

Burial grounds

No burial grounds were found or reported on the property.

Modern commercial farming

Two rectangular stone enclosures were recorded (BKN03 & BKN05). There is no reason to destroy these structures that are likely to be treasured in the future as a footprint of the development of commercial farming in the karoo. The chassis of an American manufactured vehicle was also noted an asset that commercial farmers would own in the 1950s and 1960s (BKN04).

Conclusions and Recommendations

There is no compelling reason to destroy the two stone enclosures that are likely to be treasured in the future as a footprint of the development of commercial farming in the Karoo. Other than the stone walls, the sites recorded warrant no further action. The Prospecting Right application can therefore be approved subject to precautions taken on the stone wall enclosures. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds undertaken.

Palaeontology

This information is taken out of the report done by Prof Marion Bamford from Wits University sub-contracted by Archaeological and Heritage Services Africa Pty Ltd. (Appendix 6)

The proposed site lies on the potentially fossiliferous Dwyka Group rocks, Tertiary Calcretes and Quaternary alluvium. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer, or other designated responsible person once excavations or mining activities have commenced. As far as the palaeontology is concerned, the impact is very low, and the project should be authorised.

In terms of the screening tool for Palaeontology Brakfontein falls into high sensitivity in terms of palaeontology, the necessary palaeontology has been conducted and is included into the EIA EMP document.

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

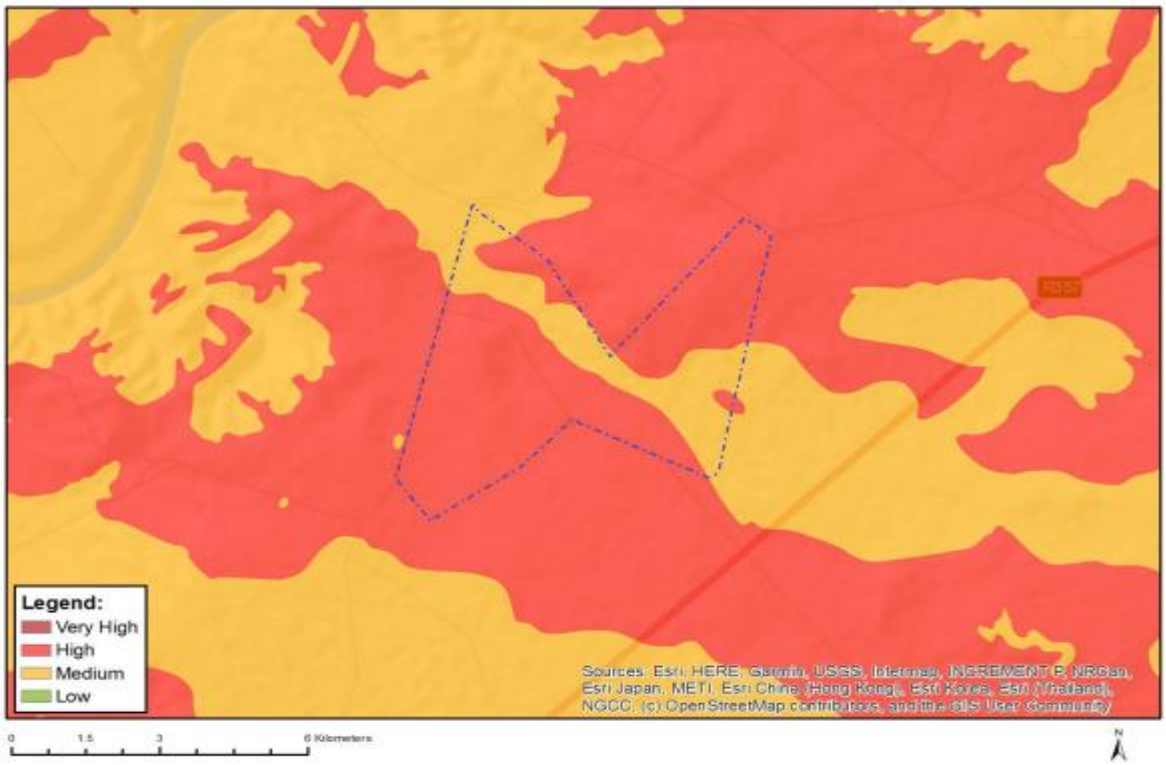


Figure 7. Map of relative palaeontology sensitivity taken out of the Screening tool.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Features with a High paleontological sensitivity
Medium	Features with a Medium paleontological sensitivity

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 process as described by NEMA for Environmental Authorisation was followed. **See table 3** Annexure 3 for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted. The landowners and neighbours were consulted with a registered letter informing them that the application had been accepted and a Scoping Report were attached in which all activities were explained.

An Advert (Notice) was placed in the DFA on 9 September 2022 to notify all other interested and affected parties that should wish to register for the project.

Registered consultation letters was sent on 12 September 2022 to all identified parties and government departments with a Scoping Report document attached.

The document was also available at the public library in Douglas.

The document was also placed on the website of Wadala.

The document can also be viewed at the EAP address with prior arrangement to view the document.

The EIA EMP document was sent out to all identified and registered parties on 3 August 2023.

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

The consultation process is ongoing.

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:*

Regional Bedrock Geology

The present Orange River between Douglas and Prieska, generally referred to as the Middle Orange River ("MOR"), displays a meandering channel morphology, best developed in areas underlain by the Dwyka Group. Palaeochannel depositional packages ("terraces") of the Orange River are preserved at different elevations above the present Orange River bed. The ages of the terraces young with decreasing elevation and, conversely, the probability of preservation decreases with increasing age and elevation.

The type section for the MOR gravels occurs at the nearby Saxendrift mine. The fluvial-alluvial gravels comprise a sequence of (basal) gravels 2-4m thick overlain by generally less than 5m of variably calcreted sands and silts and covered by a thin layer of soil and scree. The cobble-sized clasts within the gravels consist mostly of lava and quartzite with significant, if variable, amounts of Banded Iron Formation (BIF), and minor amounts of limestone, tillite, and agate. The matrix is sandy to gritty. As is usual with these types of deposits the degree of calcretisation decreases downwards, from hardpan or laminar calcrete at the surface to loosely cemented gravels at depth. The gravels are, generally, not well sorted, and are typical of braid bars that migrate through sections of river channels in response to variable water speed. The bedrock is well exposed in the workings, shale and tillite of the Karoo age Dwyka Group are common.

Local Geology

The present drainage of the region consists of the Vaal-Harts River from the northeast, and the Orange River from the southeast. There is, however, strong evidence that a major drainage, flowing along the eastern face of the Ghaap Plateau, entered the system in the vicinity of Oranjeoord, approximately 20km downstream from the Vaal-Orange confluence, during the Miocene-Pliocene.

It is suggested that this substantial river may have had as much as four times the discharge of the Orange River. Given that the area was already relatively arid, the river must have had a large catchment area, McCarthy (1983) suggesting that it had the upper Zambezi, Okavango and Kwando rivers as tributaries. The upper Limpopo may also have flowed into the system during the Miocene-Pliocene. The alluvial diamonds of the Middle Orange have several probable primary source areas: - the diamondiferous kimberlites of Lesotho, eroded by the present Orange River; diamonds from the same source as the Lichtenburg - Western Transvaal diamondfields, eroded by the Vaal-Harts system; diamonds derived from the kimberlites of the Kimberley area; and diamonds from Botswana and the Postmasburg fields, including the Finsch kimberlite, eroded by the palaeo-drainage note above.

A terrace deposit is defined as an alluvial package of sediments in a braided river environment. Subsequent incision by the river at times of less energetic flow cuts into the braided deposits, leaving them perched above current river level. If this incision takes place in the centre of the valley-fill, terraces will be developed on both banks of the river. If incision is accompanied by lateral migration, as is often the case, the terrace is restricted to one bank only. Therefore, "terrace" is a morphological term, and the terrace can display any or all of the typical braided stream features, such as splays, chute bars, point bars, channels, sand banks. The terrace initially preserves the morphology of the braided river deposits, but later erosion can dissect or totally remove the terrace. On a regional scale, the terraces tend to have an elongated sheet-like shape, with an overall gentle gradient downstream, but this gradient can be stepped at barriers across the river valley, such as lithological changes in bedrock, cross dykes, etc. Consequently, contemporaneous terraces can be deposited at differing elevations, and, conversely, terraces at the same elevation were not necessarily deposited during the same cycle, at the same time.

Several attempts have been made to correlate named terraces along the Vaal and middle Orange Rivers using the base elevations, both above sea level and above the present river level, of the various deposits. These attempts at correlation have met with limited success. In addition to the problem of stepping, no allowance can be made for post-depositional regional warping. Subsequent differential incision of the river into the terrace platform can also render the latter approach doubtful. The descriptions of the gravels given here are a composite of information taken from McCarthy (1998).

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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 4).

According to the 1:250 000 Geological Map of 2922 Prieska (1995), the geological features on Brakfontein comprise Quaternary and Tertiary deposits (Figure 8). Calcrete is prominent in the north and south, while sand and sandy soil occur in the centre of the study area. The alluvial diamond deposits are expected to be associated with the calcrete (Figure 8).

Figure 8. The distribution of geological features in the study area.

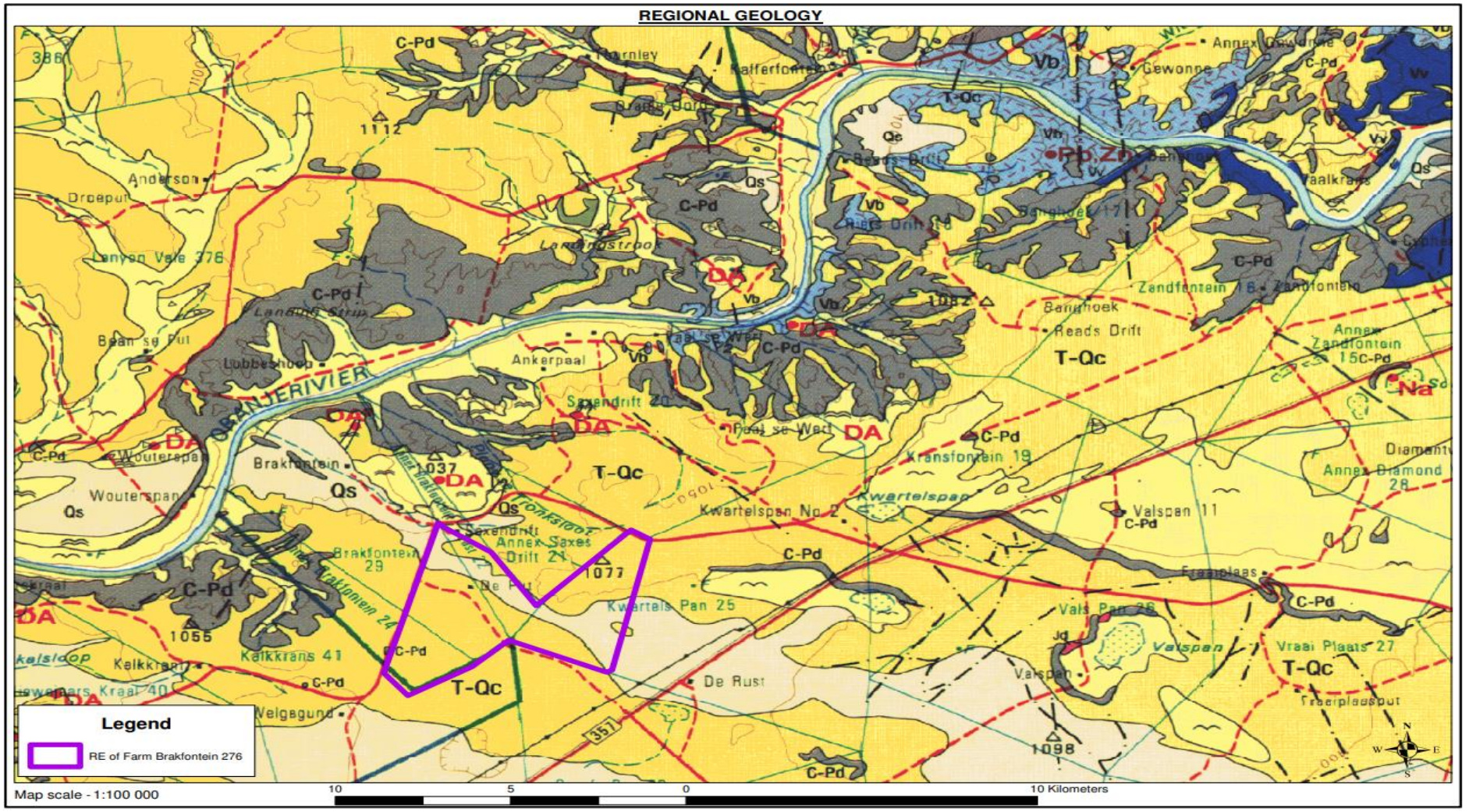


Figure 9. *- Extract from 1:250 000 geological map (Council for Geoscience, Pretoria) showing location of the farms Blue (Vgd) = Campbellrand Subgroup comprises of coarse to fine grained dolomite and limestone, Grey (C-Pd) = Dwyka Group, Yellow (T-Qc) = Neogene calcrete, Pale yellow (Qs) = Quaternary to Recent sands and sandy soil of the Gordonia Formation (Kalahari Group). DK marks Diamond in Kimberlite.*

(2) CLIMATE:

Regional Climate

The mine is located in a semi-arid region, receiving on average about 250 mm of rain in the west to 500 mm on its eastern boundary. The rainfall is largely due to showers and thunderstorms falling in the summer months October to March. The peak of the rainy season is normally March or February. The summers are very hot with cool winters.

Table 4. Catchment characteristics for the Boegoeberg quaternary catchments (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)
D71C	1 592	250	2 350	4.75

Wind

The prevailing wind direction for the area is north to north-north-west for the months of January to September and changing from north to sometimes westerly winds during October to December averaging 3.5 m/s (Kimberley 01/01/1990 – 31/08/2000, Station 0290468).

Incidents of Extreme Weather Conditions

- **Hail**
  Hail is sometimes associated with thunderstorms and mainly occurs in early to late summer (November to February). It occurs on average three times a year and although these storms may sometimes be severe and cause much damage, they usually impact on a relatively small area.

- **Frost**
  The period during which frost can be expected lasts for about 120 days (May to August). With extreme minimum temperatures to below -8°C at night in the winter, frost development can be severe.

- **Droughts**
  Droughts are common and may vary from mild to severe. During these periods dust storms sometimes occur, depending mainly on denudation of the surface.

- **Wind**
  High winds are unusual but when they do occur can uproot trees and take off roofs.

(3) *TOPOGRAPHY:*

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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, topography was described and included in this report as part of the Ecological study (Appendix 4).

The topography of the study area is characterised by level plains with some relief. Here, altitude ranges from 1 010 – 1 050 m above sea level. The terrain is indicated by a very gentle slope of <1 % across the study area.

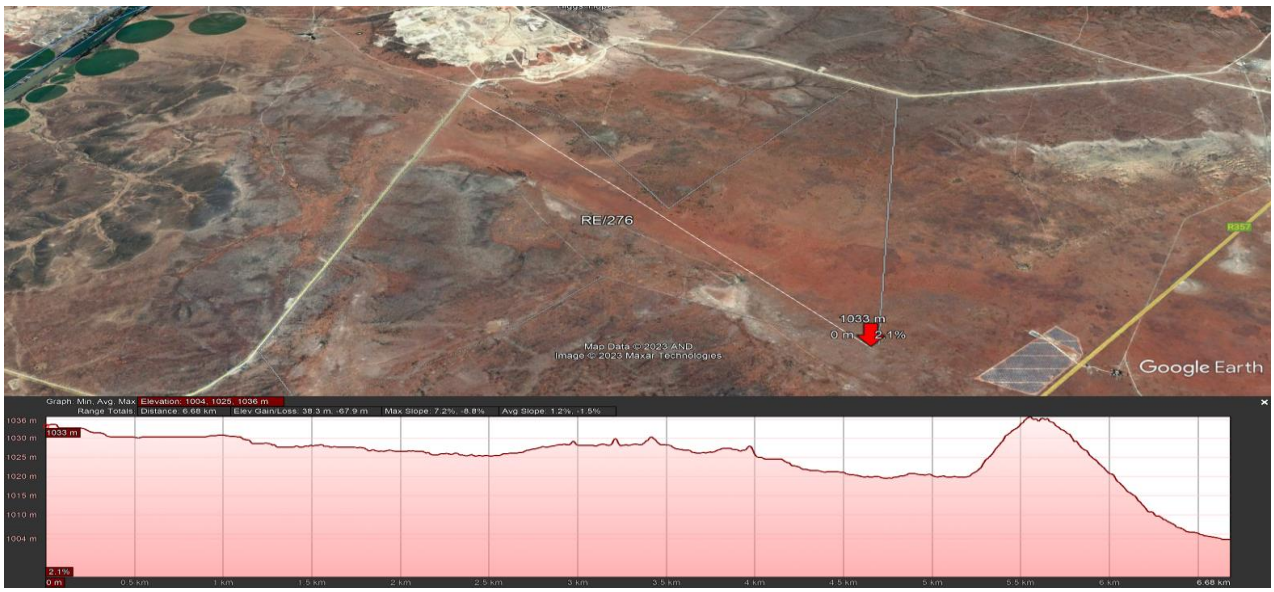


Figure 10. Elevation on the application property from southeast to north west towards the Orange River

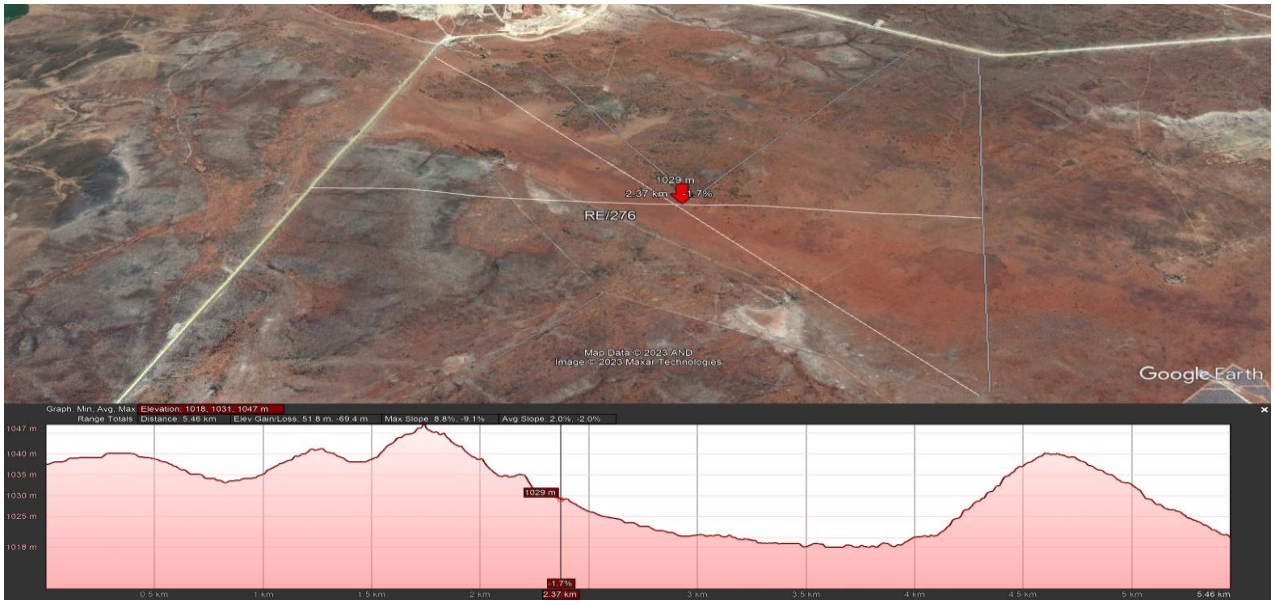


Figure 11. Elevation on the application property from east to west towards the Orange River

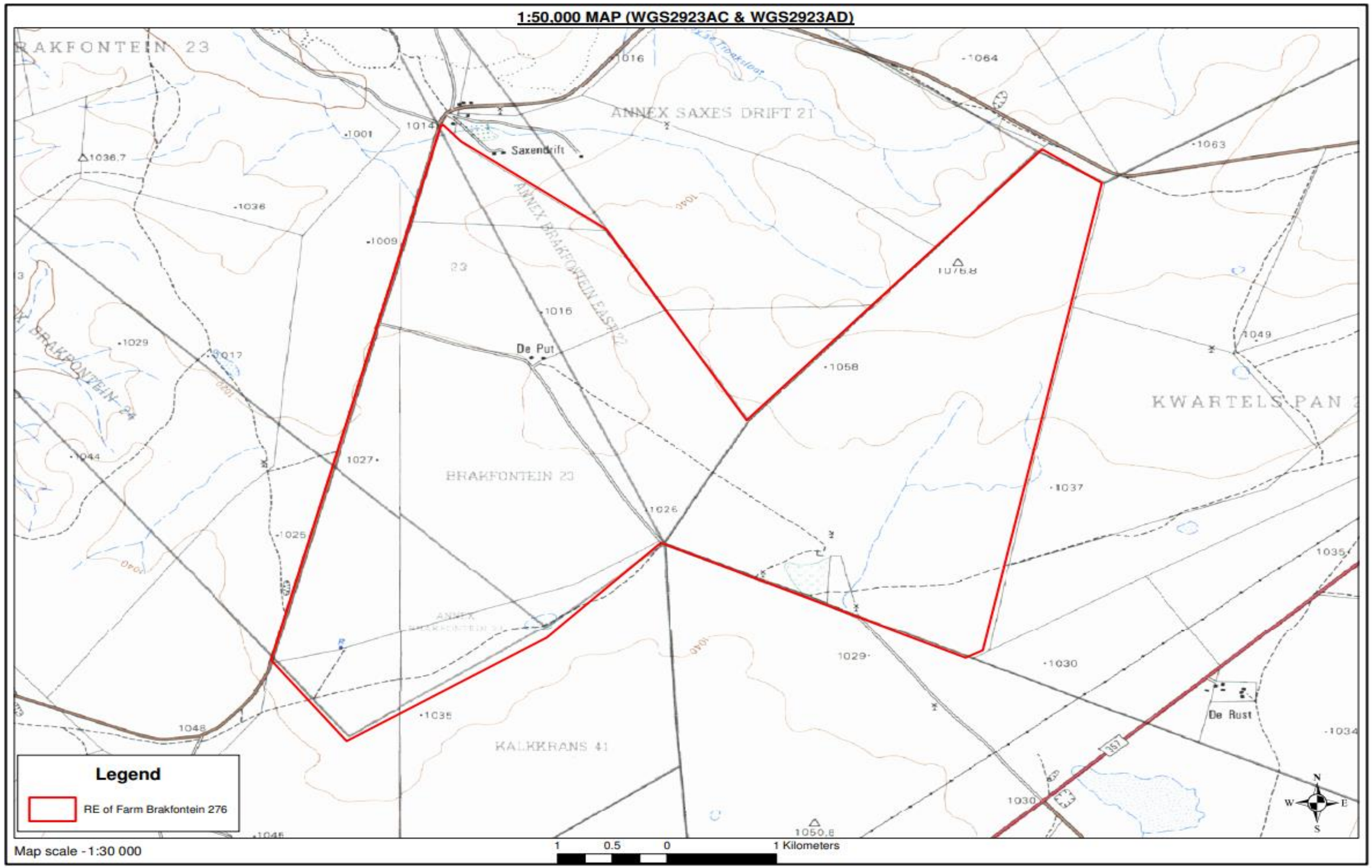


Figure 12. Topographical map of farm Brakfontein, Hopetown

(4) *SOILS:*

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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, soil was described and included in this report as part of the Ecological study (Appendix 4).

Landtypes found on Brakfontein include Ag136, Ag143 and Fc568 (Figure 13). The calcrete terraces, primarily represented by the Ag136 and Ag143 land type, are characterised by red-yellow apedal, freely drained soils, red, with high base status, and are shallow (< 300 mm deep). The centre of the property, depicted by the Fc568 landtype, comprise Glenrosa and/or Mispah forms, with lime generally present.

Soils of the study area have high wind erosion- crusting- and compaction susceptibility. Water erosion susceptibility is also high, but due to the arid climate water erosion risks are low.

Figure 13. The distribution of land types in the study area.

(5) LAND CAPABILITY AND LAND USE:

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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 capability and land use was described and included in this report as part of the Ecological study (Appendix 4).

Land Use before Prospecting

The Brakfontein site is situated in a rural area, with major land uses in the region including mining and agriculture. According to AGIS, the land capability for the study site is primarily non-arable but is suitable for grazing. The agricultural region is demarcated for sheep farming, with the grazing capacity estimated at 32 Ha/LSU.

Apart from the proposed prospecting activities, the prospecting right area is mainly utilised for agriculture. A large area in the south has been transformed for cultivation, while the pristine areas are used as natural pastures for grazing by livestock and game.

Evidence of Disturbance

Currently, the property is primarily used for grazing by livestock and wildlife.

Existing Structures

Existing infrastructure includes old homesteads, farm tracks and grazing camps (Figure 14).

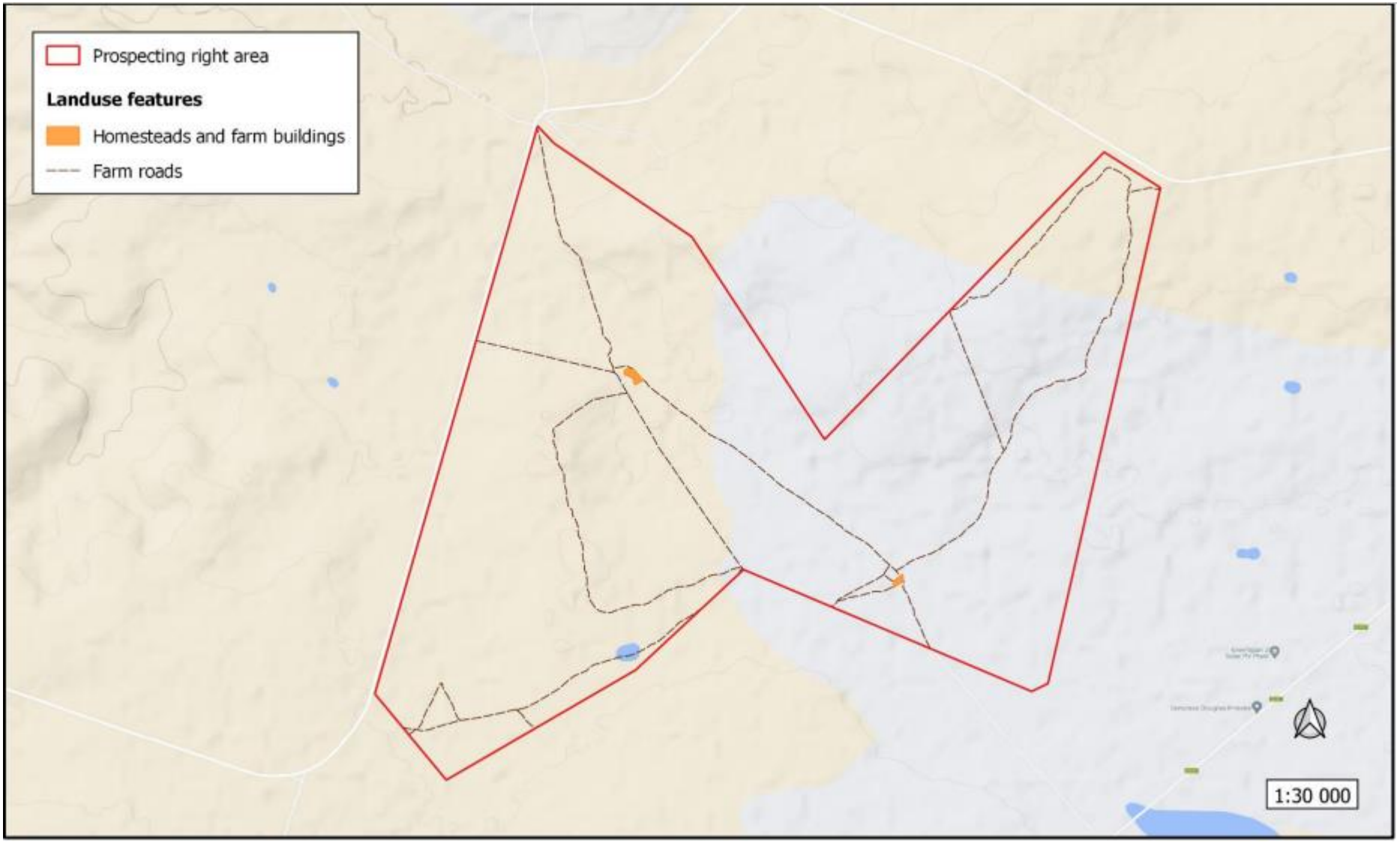


Figure 14. Evidence of existing infrastructure and past disturbances in the study area.

(6) *NATURAL FAUNA:*

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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 capability and land use was described and included in this report as part of the Ecological study (Appendix 4).

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 (Schedule 2) or specially protected (Schedule 1) wild 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. According to the act "wild animal" means a live vertebrate or invertebrate animal, and the egg or spawn of such animal.

The landscape features on the Brakfontein site provide several habitat opportunities to faunal communities. Wild 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 nine bat species have been recorded in the region. Species that were encountered during the site visit include Gemsbok, Springbok, Greater Kudu, Steenbok and Yellow Mongoose. Signs of activities from fossorial mammal species were also observed.

Seven listed terrestrial mammal species and two listed bat species potentially occur in the area. Virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA.

Honey Badger, Aardwolf, African Wild Cat, Cape Fox, Bat-eared Fox and Striped Polecat have a high chance of occurring across the site, given their wide habitat tolerances. Aardvark, Ground Pangolin and African striped Weasel have a high potential of occurring in the shrubby grassland on sand. Pangolins, however, are seldomly encountered due to their inconspicuous nature. Similarly, the South African Hedgehog also has a high chance of occurring on site based on their association with open, arid habitat.

Black-footed Cat prefers arid habitat, but their conspicuous nature might cause them to avoid the study area due to ongoing prospecting activities. It therefore has a moderate potential to occur on site.

The African Straw-coloured Fruit-bat requires fruit trees and is not expected to occur on site. Similarly, Dent's Horseshoe Bat also has a low chance to be found on site due to their preference for savanna habitats. The Brown Hyaena has a low potential to be found on site mainly since farm fences are restricting their occurrences across their natural distribution range. The Littledale's whistling rat is also not expected to occur on site based on their restricted distribution. The Cape Clawless Otter is restricted to river habitats and is therefore not expected to be found on site.

Apart from these special species of conservation concern, problem animals (Schedule 4 of the NCNCA) with a high likelihood to occur on site include Black-backed Jackal, Caracal and Vervet Monkey.

Reptiles

The Brakfontein prospecting area lies within the distribution range of at least 36 reptile species. No listed species are known to occur in the area, but most reptiles of the study area are protected either according to Schedule 1 or 2 of NCNCA.

Specially protected species include Karusasaurus polyzonus (Southern Karusa Lizard) and Chamaeleo dilepis dilepis (Common Flap-neck Chameleon). The Karusa Lizard is a rockdwelling speciesinhabiting rocky outcrops and is not expected to occur on site. The Common Flap-neck Chameleon is typically found high up in bushes or trees and is expected to potentially occur across the site.

South African endemics include Pachydactylus mariquensis (Common Banded Gecko), Lamprophis aurora (Aurora Snake) and Homopus femoralis (Greater Dwarf Tortoise). The Common Banded Gecko prefers sandy soil and sparse vegetation in a variety of habitats such as sandy plains and dry riverbeds. The Aurora Snake is often found near streams and under rocks and old termitaria, while the Greater Dwarf Tortoise occurs in rocky areas with dense vegetation where they take shelter among rocks or under plants.

The Western Ground Agama, a common species of Least Concern, was frequently encountered during the field survey. The remaining common reptile species of the region are expected to occur in the terrestrial habitats on site, while the Marsh Terrapin is expected to be associated

with the ephemeral pans. It survives drought by burrowing into moist soil and then emerges after good rains.

Amphibians

Fourteen amphibian species are known from the region. The ephemeral pans represent suitable habitat for breeding during wet periods. Those frog species that are fairly independent of water (i.e. Bushveld Rain Frog, Boettger's Caco) are expected to take refuge under rocks and logs, soil cracks, sandy substrates, leaf litter and abandoned mounds of termites.

The Giant Bull Frog (Pyxicephalus adspersus, is listed as Near Threatened in the Southern African Frog Atlas and is protected according to Schedule 1 of the NCNCA. They prefer seasonal shallow grassy pans, vleis and other rain-filled depressions in open flat areas of grassland or savanna, but mainly remain buried up to 1 m underground until conditions become favourable. The site lies within the known distribution of this species and the ephemeral pans provide ideal habitat for it on site, especially the pan in the west.

All other amphibians of the study area are protected according to Schedule 2 of NCNCA. Raucous Toad (Amietophrynus rangeri) and Southern Pygmy Toad (Poyntonophrynus vertebralis) are endemic to South Africa and occur in a variety of terrestrial habitats for most of the time. However, they use temporary waterbodies containing rainwater to breed, including pans, pools, roadside ditches, farm dams and even quarries.

Avifauna

The study site does not fall within or near (< 100 km) any of the Important Bird Areas (IBA) defined by Birdlife South Africa. A total number of 261 bird species have been recorded from the region, of which as many as 25 are listed and classified as Vulnerable, Near Threatened, Endangered or Critically Endangered. Furthermore, all birds are protected either according to Schedule 1, 2 or 3 of NCNCA. Plants, from grass tufts to shrubs and trees provide important micro-habitats to birds in the terrestrial habitats, while ephemeral pans further increase habitat opportunities to water birds during the rainy season. Therefore, the study area is expected to host a diverse avifauna community.

Many of the species of conservation concern are expected to occur on site either by occasionally passing over, foraging, or nesting. The most common bird species of conservation concern expected to occur in the terrestrial habitats on site include Kori Bustard (Near Threatened), Ludwig's Bustard (Endangered), Secretarybird (Vulnerable) and Tawny

Eagle (Endangered). Pale Chanting Goshawk (NCNCA: Schedule 1) was encountered in the shrubland on calcrete. None of the ephemeral pans were inundated during the field survey, but they could potentially attract protected water birds, such as Curley Sandpiper, Black-winged Pratincole, Marabou Stork, Maccoa Duck, Lesser Flamingo, Greater Flamingo and Greater Painted-snipe during wet seasons, of which all are Near Threatened.

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. No fish are expected to occur in the ephemeral pans, even when filled, mainly due to their ephemerality. Therefore, no fish species are expected to occur on site.

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 study. 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.

Eight invertebrate species of the Northern Cape appear on the IUCN Red Data list of threatened species. However, none of these species' distribution ranges overlap with that of the study area. 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 sp.) have been recorded from the region.

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 and Rock Scorpions as well as some Gossamer-winged Butterflies, Skippers, Brush-footed Butterflies and Satyrs have the highest likelihood to be found on site.

All other invertebrates from the class Insecta and Arachnida are protected according to Schedule 3 of the NCNCA.

Two major habitats delimit possible invertebrate communities in the study area:

i. **Terrestrial vegetation classified as Karoo for insect preference (Picker et al. 2004)**
Species All the terrestrial vegetation communities on site fall within this habitat and represent unique species assemblages, with an above-average representation of beetles, grasshoppers, flies, wasps, and lacewings. The protected spiders, butterflies and scorpions discussed above would also be associated with this habitat. Termitaria, most likely belonging to Trinervitermes trinervoides, as well as Community Nest Spiders (Stegodyphus sp.), Brownveined White (Belenois aurota), and Cicadas were recorded during the field survey.

ii. Ephemeral pans
Ephemeral pans in the region are known to host specialist crustaceans which are specifically adapted to ephemerality. None of the pans on site had water during the field survey and therefore could not be sampled for live aquatic specimens. However, Branchipodopsis sp. (Anostraca, fairy shrimp), Daphnia sp. (Cladocera, water fleas), CHYDORIDA sp. (Cladocera, water fleas), and Ostracoda hatched from sediment collected from the Pan in the west. Ostracods also hatched from the pan in the east, while Anostraca and Notostraca eggs were found in the sediment, but no other hatchlings emerged during the hatching trials.

Their eggs lie dormant in the soil until the pans are inundated. They then hatch and mature rapidly to produce eggs that accumulate in the top few centimetres of the sediment. These eggs are heat and drought resistant and ensure the continued existence of species in a habitat. The egg banks are essentially the vault that contains the biodiversity of the aquatic habitat during times of drought. Any disturbances to the soil will expose the eggs to erosion and crushing, which will result in species losses and possible extinction. Within a few days after the pans are inundated the crustaceans eggs will hatch. This usually attracts several wetland birds to forage on the crustaceans as their main food source. Therefore, the crustaceans are essential components in the food web. These pans also act as important breeding and feeding links to birds in terms of connectivity, by providing stepping-stone corridors in an arid landscape. The disturbance or destruction of these pans will not only impact the specialised pan invertebrate communities locally but will also have a regional and landscape-level effect.

7) Flora:

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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 capability and land use was described and included in this report as part of the Ecological study (Appendix 4).

Broad-scale vegetation patterns

The study area falls within the Nama Karoo Biome (Mucina and Rutherford 2006). According to the vegetation map of Mucina and Rutherford (2012), the site is represented by one broad-scale vegetation units, i.e. Northern Upper Karoo (Figure 15). This vegetation map however does not reflect the true character of the site, because it has not been mapped at a very fine scale. Therefore, field-based classification of small-scale vegetation patterns are discussed in the next section.

Northern Upper Karoo is found in the Northern Cape and Free State at altitudes between 1 000 and 1 500 m. It is mainly restricted to the Northern regions of the Upper Karoo plateau from Prieska, Vosburg and Carnarvon in the west to Phillipstown, Petrusville and Petrusburg in the east. The topography is typically flat to gently sloping, with isolated hills in the Upper Karoo Hardeveld (in the south) and Vaalbos Rocky Shrubland (in the northeast). Numerous pans are interspersed in this unit. The vegetation occurs mainly as shrubland dominated by dwarf karoo shrubs, grasses and Senegalia mellifera. The geology and soil of this unit varies greatly.

Geology includes shales of the Volksrust Formation, Dwyka Group Diamictite, Jurassic Karoo Dolerite sills and sheets, and calcretes of the Kalahari Group. Soils range from shallow to deep, red-yellow, apedal, freely drained to very shallow Glenrosa and Mispah forms. The most dominant landtypes are Ae, Ag and Fc. It is estimated that about 4% of the Northern Upper Karoo has been cleared for cultivation or transformed by building of dams; and human settlements are increasing in the north-eastern parts. Erosion is moderate, very low and low, while Prosopis glandulosa, considered among the top 12 agriculturally significant invasive alien plants in South Africa, are widely distributed in this unit. The unit is classified as being least threatened and it is not currently conserved within any formal conservation areas. Endemic plant species known from this unit include Lithops hookeri, Stomatium pluridens, Atriplex spongiosa, Galenia exigua and Manulea deserticola.

Fine-scale vegetation patterns

The proposed finer scale vegetation communities were delineated according to plant species correspondences and changes in soil structure. These can be divided into three distinct units (Figure 16) and are described below.

i) Senegalia mellifera - Enneapogon desvauxii open shrubland on calcrete

This plant community occupies most of the study area, where it is found on calcrete terraces in the north and south of the property (Figure 16). The vegetation is presented as shrubland with tall shrubs, scattered in a grassy matrix intermixed with dwarf shrubs (Figure 16). Rocky, calcareous soil covers 10 - 20% of the ground surface and biological soil crusts are prominent (Figure 16).

Senegalia mellifera dominates the tall shrub layer, but Boscia albitrunca is also common. Other tall and medium-sized shrubs include Phaeoptilum spinosum, Cadaba aphylla, Kleinia longiflora, Rhigozum trichotomum and Prosopis velutina. The dwarf shrub layer is more diverse and is dominated by Roepera lichtensteiniana, Pentzia incana, P. calcarea, Aptosimum albomarginatum and Pteronia mucronata, but Aizoon asbestinum, Melhania rehmannii, Thesium lineatum, Sericocoma avolans, Fagonia minutistipula, Aptosimum spinescens, Pegolettia retrofracta, Felicia fascicularis, Rosenia humilis, Pentzia globosa, Justicia incana and Plinthus karooicus are also widespread.

The grass layer is predominantly short and dominated by Enneapogon desvauxii, but Aristida junciformis forms dense patches in places. Other common grasses include Eragrostis nindensis, E. echinochloidea, Stipagrostis ciliata, Fingerhuthia africana.

Herbs include Tribulus zeyheri subsp. zeyheri, Limeum aethiopicum, Geigeria ornativa, Lotononis laxa, Helichrysum argyrosphaerum and the invasive Argemone ochroleuca.

Figure 15. The broad-scale vegetation units (Mucina and Rutherford 2012) present in the study area.

ii) Stipagrostis uniplumis - Eragrostis rigidior shrubby grassland on red sand

This plant community is restricted to the sandy substrate in the centre of the study area (Figure 16). The vegetation occurs on shallow sand, which constitutes approximately 10 – 20% of the ground cover. Biological soil crusts are common. The vegetation is presented as a shrubby grassland where a dominant grass layer is intermixed with low shrubs, while tall shrubs are very sparsely scattered.

The grass layer is dominated by Stipagrostis uniplumis, with Eragrostis rigidior also being common. Other grasses include Aristida congesta subsp. congesta, Eragrostis lehmanniana, Enneapogon desvauxii, and Stipagrostis ciliata.

The low shrub component is diverse, with Aptosimum albomarginatum, Justicia incana and Pegolettia retrofracta dominating. Other common species include Plinthus karooicus, Aptosimum marlothii, A. spinescens, Thesium hystrix, Lycium pilifolium, Pentzia calcarea, Asparagus suaveolens, Helichrysum lucilioides, Pteronia mucronata, Ruschia spinosa and Melolobium microphyllum. Sparsely scattered tall shrubs include Asparagus retrofractus, Lycium bosciifolium, Senegalia mellifera, Prosopis velutina and Rhigozum trichotomum.

The herb layer is well developed and include Hermannia erodioides, Senna italica, Indigofera alternans, Geigeria ornativa, Helichrysum argyrosphaerum, Sericorema remotiflora, Gazania krebsiana subsp. arctotoides and the bulb Moraea simulans.

iii) Prosopis dominated ephemeral pans

The two ephemeral pans occur along the southern boundary of the study area (Figure 16) Their plant communities differ substantially, but both pans have been significantly infested by Prosopis velutina. The pan in the west is presented as grassland, with bare ground constituting approximately 10% of the ground cover. Here, Aristida congesta subsp. congesta dominate, but Eragrostis echinochloidea, E. bicolor, E. obtusa and Panicum coloratum are also common. Herbs include Lotononis laxa, Osteospermum muricatum, Boerhavia diffusa, Heliotropium ciliatum and Selago densiflora. Low shrubs from the surrounding shrubland matrix, such as Pentzia globosa Aptosimum albomarginatum, have encroached the pan. The pan in the east is presented as shrubland with very low diversity and bare ground constituting approximately 70% of the ground cover. Apart from Prosopis, Atriplex nummularia dominates this community, with Mesembryanthemum coriarium scattered sparsely across the pan.

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, which are protected under the National Environmental: Biodiversity Act (Act No. 10 of 2004) (NEMBA), 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.

Most species of the region are classified as least concern; a category which includes widespread and abundant taxa. However, two species are listed under the National Environmental: Biodiversity Act (Act No. 10 of 2004) (NEMBA). Acanthopsis hoffmannseggiana (Data Deficient – Taxonomically Problematic (DDT)) is a widespread and variable species that possibly contains several taxa, some of which may be of conservation concern and more study is needed to find reliable distinguishing characters to separate individual taxa. It was not recorded in the study area but are generally common on the calcrete plateaus and tillite ridge slopes of the region. Salsola smithii is also listed as DDT.
The entire Salsola genus needs taxonomic revision because its species are poorly defined and difficult to separate. Therefore, based on currently available data, the risk of extinction of this species cannot be assessed. It was also not recorded during the field survey.

Species protected in terms of the National Forests (NFA) Act No 84 of 1998 include Boscia albitrunca, which was restricted to the shrubland on calcrete. Here, it was found at low densities of approximately one individual per hectare, primarily as adults, i.e., stunted shrubs (80 cm - 1 m (h) x 2 m (d)), taller shrubs (1 - 2 m (h) x 2 m (d)), younger trees (1 - 2 m (h) x 1 m (d)) and very large old trees up to 3 m (h) x 6 m (d).

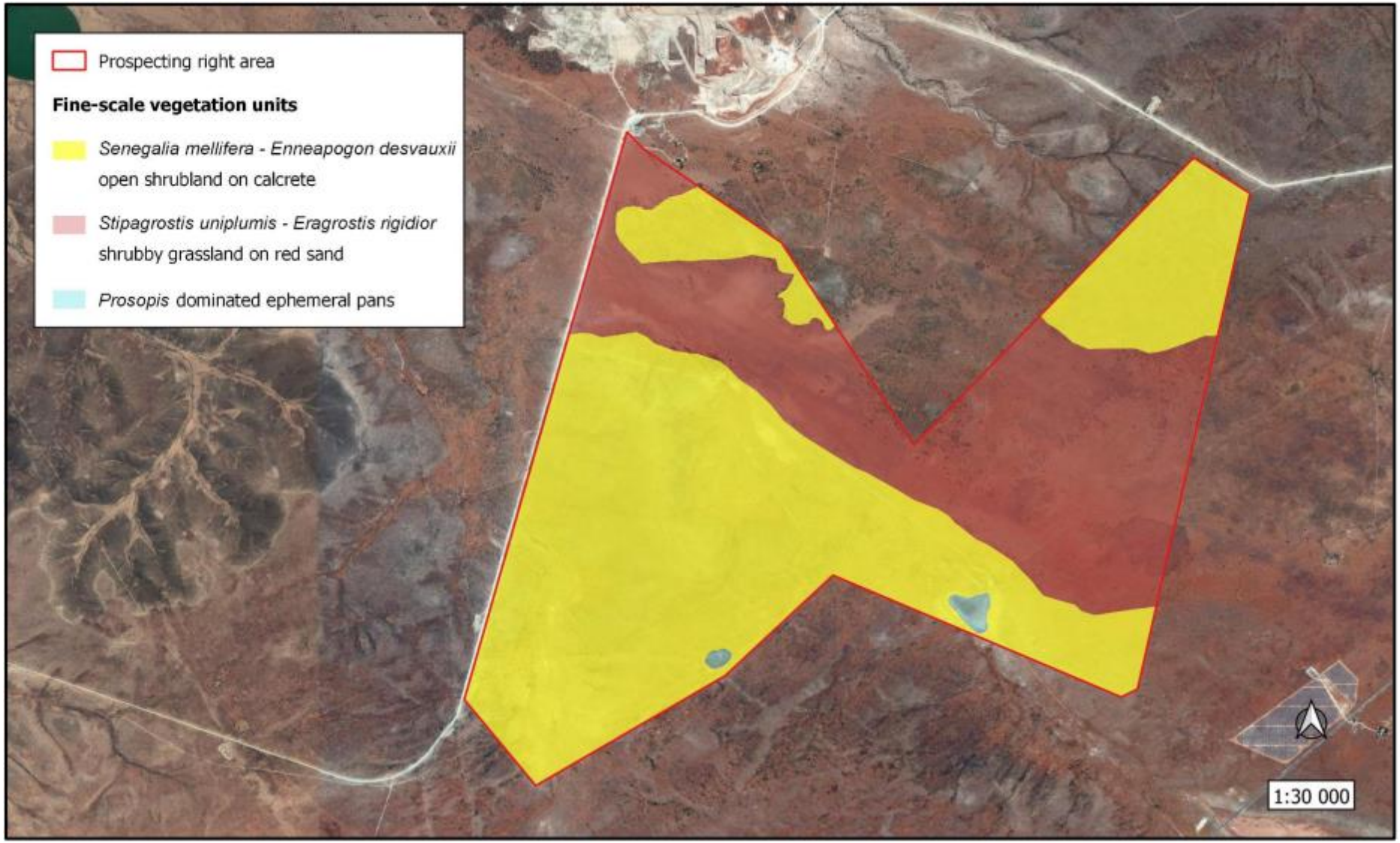


Figure 16. The distribution of fine-scale plant communities in the study area.

Protected species in terms of Schedule 1 and 2 of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009 are listed in Table 2 of the ecological study. No species specially protected under Schedule 1 were recorded during the field survey. Those protected under Schedule 2 include all Aizoaceae species previously included in the family Mesembryanthemaceae, all species included in the family Apocynaceae and Iridaceae, as well as Boscia albitrunca. Microloma armatum var. armatum is known from the region but was not recorded on site. Ruschia spinosa and Moraea simulans were both restricted to the shrubby grassland on red sand, while Mesembryanthemum coriarium was restricted to the ephemeral pan in the east.

Although not formally regulated, biological soil crusts were associated with the calcareous soils of the shrubland and open grassland on red sand. These are very sensitive microhabitats and an integral component of arid environments. These crusts are thin layers 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, biological soil crusts may take 250 to 1 000 years in arid 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 the study region are listed in Table 4, along with their categories according to CARA, NEMBA and NCNCA of the ecological study.

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, recorded in the study area, are listed in Table 5 of the ecological study.

(*8*) *SURFACE WATER*

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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 4).

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 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 the DWS in terms of Section 21 (c) and (i). 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.

The Brakfontein study area falls within the Boegoeberg quaternary catchment D71C of the Lower Orange Water Management Area (Figure 17). This quaternary catchment has been allocated a Present Ecological State (PES) of 'Moderately Modified' (C) by Smook et al. (2002), and information regarding its mean annual rainfall, evaporation potential and runoff is provided in Table 5.

Table 5. Catchment characteristics for the Boegoeberg quaternary catchments (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)
D71C	1 592	250	2 350	4.75

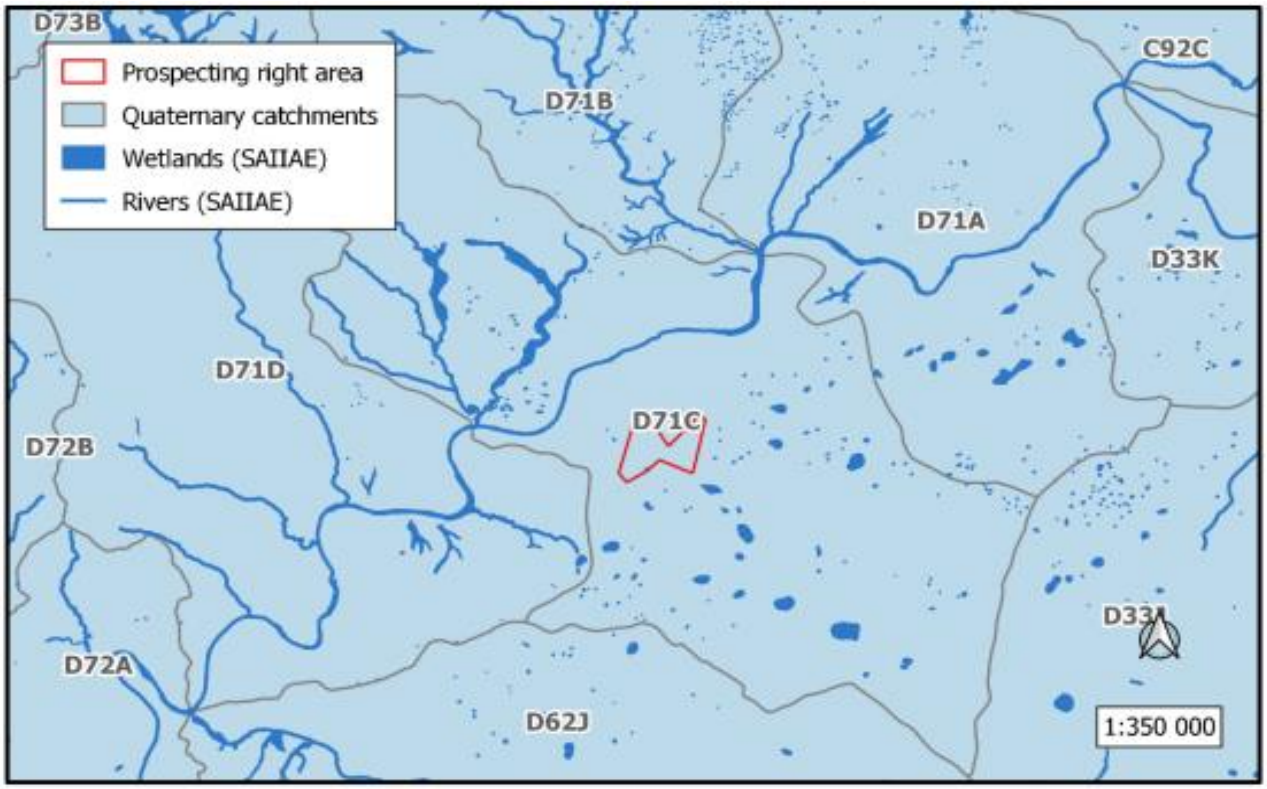


Figure 17. The locality of the proposed prospecting area in relation to the quaternary catchments of the Lower Orange Water Management Area.

According to The South African Inventory of Inland Aquatic Ecosystems (SAIIAE), Brakfontein falls within the Upper Karoo Bioregion, where 1.9 % (236 551 ha) of the land area is covered by inland wetlands, including depressions, floodplains, seeps and valley-bottom wetland types (Van Deventer et al. 2019). Their spatial extent according to their present ecological status is depicted in Table 6. Most of these wetlands have been moderately to severely modified.

According to the SAIIAE, one ephemeral pan occurs on Brakfontein (Figure 18), which has been classified as being in a natural or near-natural condition.

Table 6. Percentage of inland wetland spatial extent according to the present ecological status per wetland type of the Upper Karoo Bioregion.

Wetland type	Total Extent (%)	% Natural or near-natural (A/B)	% Moderately modified (C)	% Heavily to severely/ critically modified (D/E/F)
Depression	27.9	49	10.6	40.4
Floodplain	27.5	0.4	1.7	98
Seep	2.8	11.9	76.2	11.9
Valley-bottom	41.8	5.5	35.1	59.4

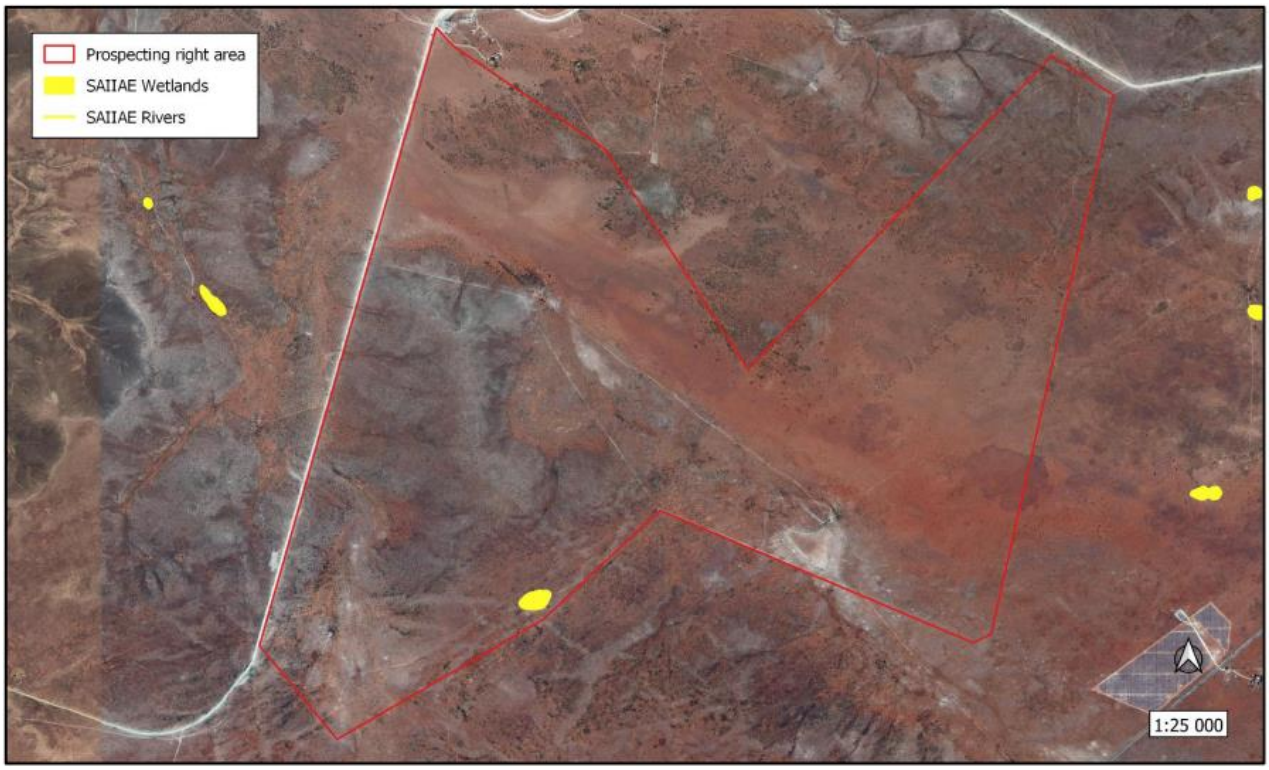


Figure 18. The location of SAIIAE wetlands on, and nearby, the proposed prospecting right area.

Watercourse delineation and classification

Two depressional wetlands (colloquially known as ephemeral pans) and a few drainage lines were identified on Brakfontein. All these watercourses are indicated in Figure 19. A minimum GIS buffer of 200 m is indicated here for wetlands and the post-mitigation buffer requirements for the drainage lines is 20 m. However, it is recommended that a conservative approach be opted for, and that the pre-mitigation buffer width of 30 m be adopted.

The depressional wetlands combined cover a total area of ± 8.6 ha, with Pan 1 being 1.6 ha and Pan 2, 6.9 ha in size. The wetland surface areas fall entirely within the boundaries of the prospecting right area. Their local upslope catchments combined total an area of ± 811 ha, of which 64 % fall within the prospecting right area (Figure 20). Pan 1 has a much

smaller catchment area of 52 ha, compared to Pan 2, which covers 759 ha. The drainage lines flow from the sandy plains, southwards towards the depression in the east, with total combined length of ± 5.5 km, of which 5 km occurs within the study area. The depressional wetlands are the main assessment units considered for this report. Therefore, the ephemeral drainage lines will not be further defined, but their buffer requirements should be honoured during the prospecting operation to minimise impacts to these systems.

The depressional wetlands are found on plains terrain and their Hydrogeomorphic Unit (HGMU) classification is described below, up to Level 6.

HGMU1: NATURAL ENDORHEIC DEPRESSIONS (EPHEMERAL PANS)
The wetlands are all classified as endorheic depressions (colloquially known as pans), with high a confidence rating. A conceptual illustration of a depressional wetland, according to Ollis et al. (2013) is presented in Figure 21. Pan 1 is a natural depression and Pan 2 is suspected to have been a natural depression originally, but cultivation practises in the 1980s leaves its status questionable. Due to its geomorphic setting however, it is classified here as a depressional wetland. Water enters both depressions primarily through direct precipitation and overland inflow. The wetlands are only filled after substantial summer rainfall events and are therefore intermittently and rarely inundated (ephemeral). Pan 1 has fresh water (EC = 88.25 µS/cm), with a neutral (6.8) pH. Pan 2 is also fresh (EC = 148.4 µS/cm), but alkaline (pH = 8.2). The soils are only intermittently saturated, and the soils do not show any soil wetness indicators. The substrata comprised sandy loam soil on Pan 1 and silty clay soil on Pan 2.

The depression floors are vegetated, with Pan 1 having a high vegetation cover (5:1), while Pan 2 comprised a large proportion of bare ground (3:3). The floristic compositions differed, with Pan 1 being dominated by grassland, and Pan 2 by shrubland.
A more comprehensive description of floristic composition is presented in Section 3.3.2 of this report. In general, Pan 1 was dominated by indigenous grasses and herbs, but heavily infested by the invasive shrub Prosopis velutina. The naturalised exotic herb Boerhavia diffusa also occurred here. Pan 2 was dominated by alien invasive shrubs, with Atriplex nummularia and Prosopis velutina occurring in high densities. No aquatic plant components were present in the pans during the field survey because it was dry. The aquatic communities are expected to only be activated after the pans are fully inundated for sufficient periods.

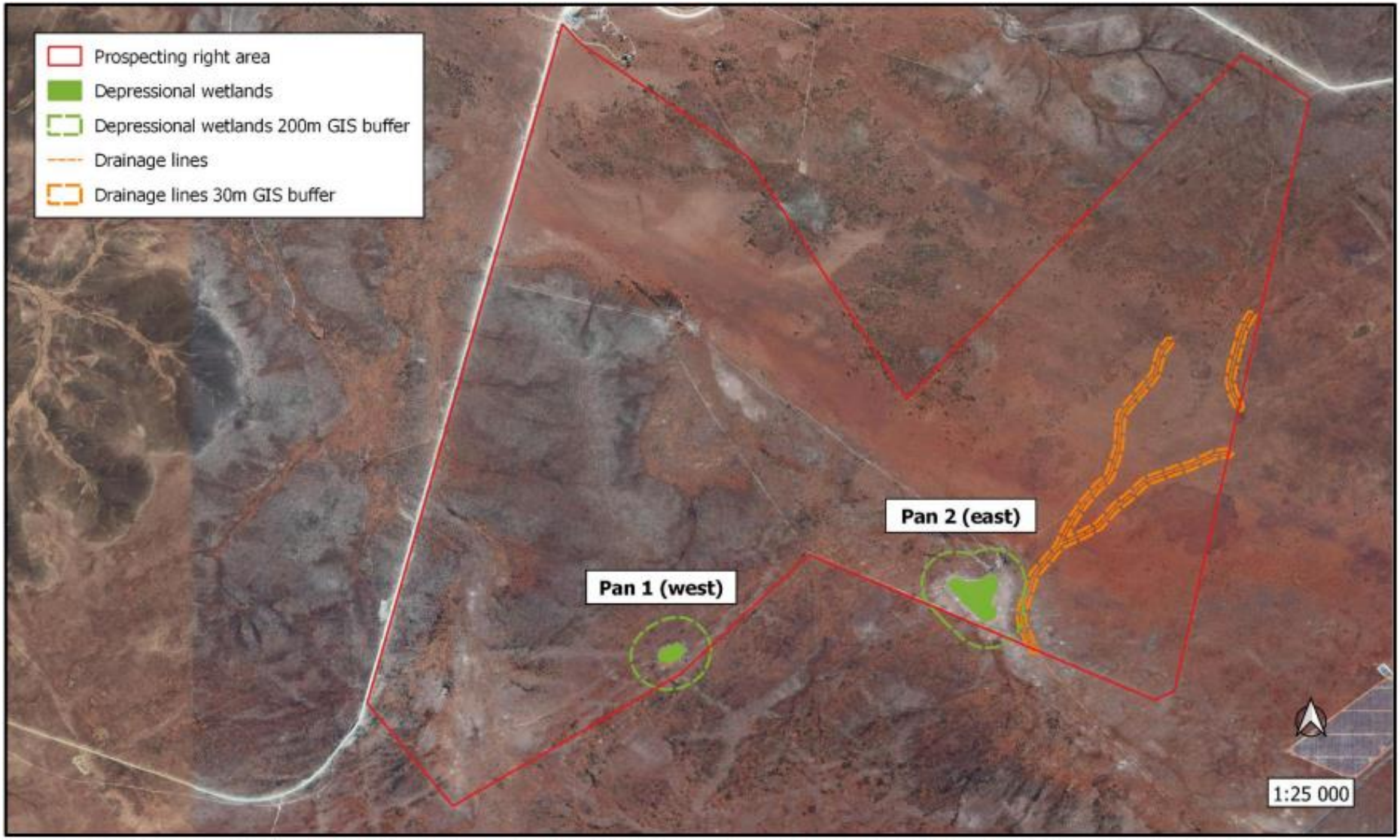


Figure 19. The delineation of watercourses in the prospecting right area, along with their GIS buffer requirements.

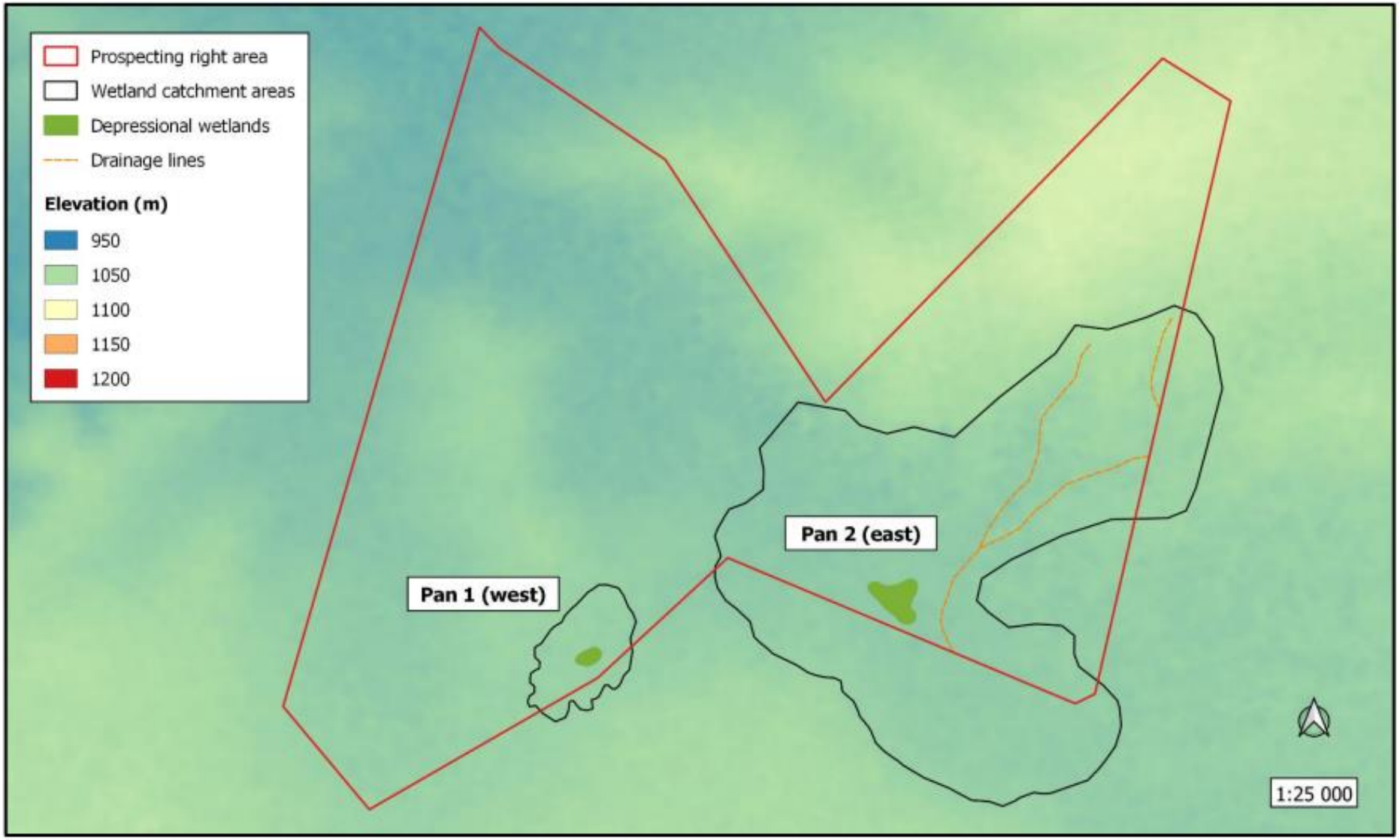


Figure 20. A digital elevation model, indicating the catchment areas of the depressional wetlands on Brakfontein.

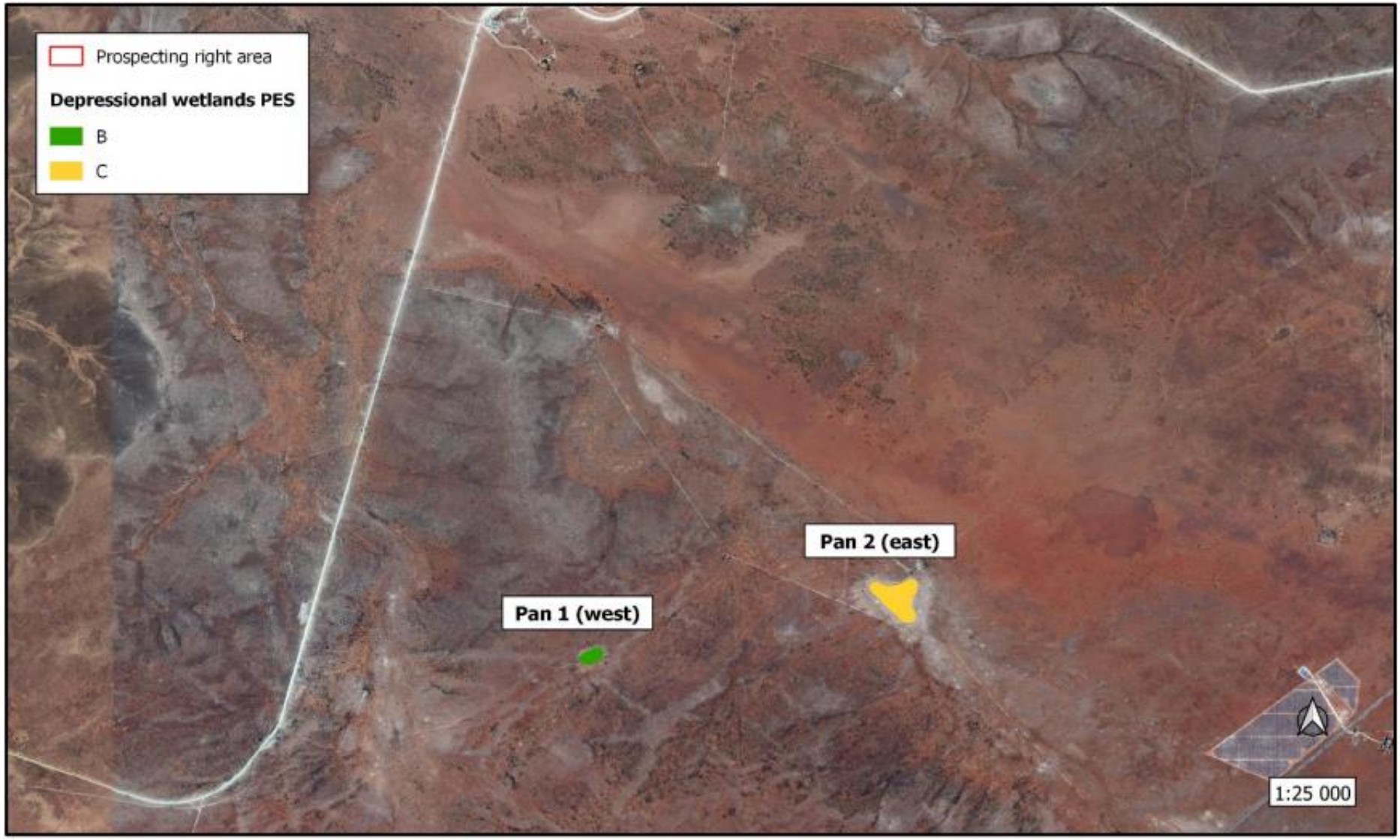


Figure 21. The depressional wetland assessment units on Brakfontein, indicating their PES.

Wetland Health Assessment (PES)

Pan 1 on Brakfontein is considered to be largely natural (PES B, Figure 22), i.e., a small change in natural habitats and biota may have taken place but the ecosystem functions are still predominantly unchanged. Pan 2 however considered to be moderately modified (PES C), i.e., loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.

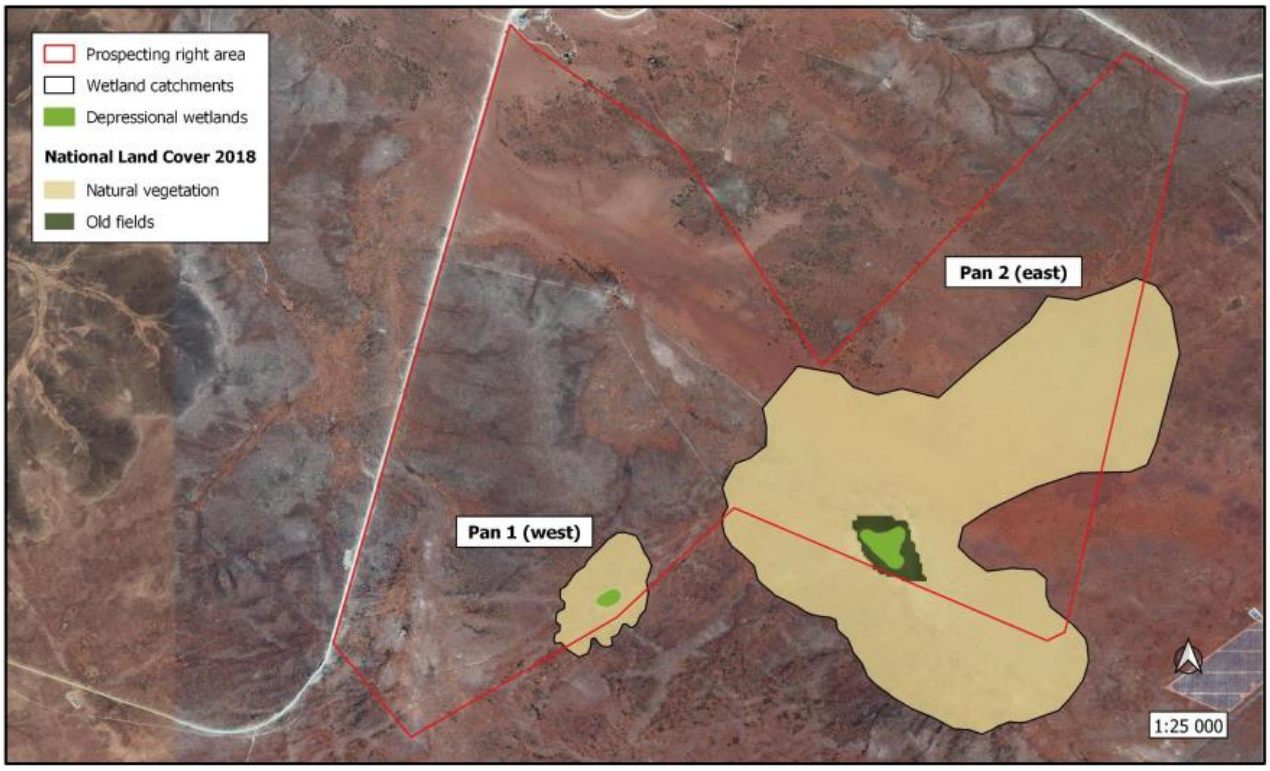


Figure 22. Refined landcover categories and disturbance units according to NLC2018, associated with the depressional wetlands on Brakfontein.

The buffer zones and catchment areas of both pans are primarily still in pristine condition with only a few impact sources, such as roads and general surface disturbances. The most significant direct modifications to both pans have occurred through the infestation of alien invasive plants, which dominate the pans and have significantly affected their vegetation impact score, due to the loss of indigenous vegetation (Figure 22). Another major impact in Pan 2 is past cultivation practises, which has significantly affected its geomorphology impact score. Deposition of material in Pan 1, assumingly to create a dam to retain rainwater for livestock (Figure 22) has affected its geomorphology and water quality but only to a very small degree. Minor surface disturbances also occur through farm roads that cut through the pan, altering its surface roughness and flow regime. However, these low-level

modifications do not have a significant effect on the overall PES of the pan.

The current state of the water quality, geomorphology and hydrology is expected to remain stable for both pans, if no prospecting activities are planned near these depressional wetlands. However, a deterioration in the natural vegetation is expected to occur if the alien invasive species in these pans and their buffer zones are not controlled. Due to their aggressive nature, these species are expected to outcompete natural vegetation and put pressure on the water resources.

Wetland Ecological Importance and Sensitivity

Pan 1 is rated to have a High EIS and is considered to be ecologically important and sensitive. The biodiversity of this wetland may be sensitive to habitat modifications. Pan 2 however is rated to have a Moderate EIS and is considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of this wetland is no longer considered to be sensitive to habitat modifications. This EIS assessment was mainly based on a "wet scenario" because the ecological importance of the depressional wetlands on Brakfontein will only manifest during times of inundation. However, activities impacting the wetlands during the dry phase have direct implications on its ability to maintain the ecological integrity and sensitivity of the wet phase.

The Near Threatened Giant Bull Frog and a number of red listed water birds are expected to occur in Pan 1 when inundated. The hatching trials revealed that freshwater crustaceans are present in both pans. These are highly unique to depressions on a national scale. Their egg banks are found in the topsoil layers, which make them vulnerable to modifications.

The exact species richness hosted by these wetlands is however not known. Although a number of species are expected to occur in these habitats, they are only expected to have a moderate significance, as they are only expected to have significant taxa richness at a local scale. Furthermore, Pan 1 in particular is expected to be an important breeding and feeding link in terms of connectivity, especially for wetland birds in South Africa during wet periods by providing stepping-stone corridors in an arid landscape. Pan 2 is not expected to provide a significant role in that regard, due to its altered state.

All depressional wetlands on Brakfontein have low sensitivity to changes in hydrology and water quality, because they flood infrequently (< annually). However, if these systems are inundated anthropogenically

and for prolonged periods, they will lose their ability to sustain the unique aquatic communities, which are adapted for ephemerality, e.g. branchiopod eggs require periods of desiccation for their life cycles to complete. Furthermore, the wetlands have marginal food storage, energy dissipation and element removal ability, mainly based on fairly low roughness associated with the vegetation in these habitats.

All watercourses are protected under the National Water Act, which reflects their importance for the conservation of ecological diversity at a national scale and therefore they have high protected status. Pan 1 has not been significantly affected by human activity, and therefore it still has high ecological integrity. However, Pan 2 has been modified and therefore it has low ecological integrity.

Wetland functional importance

The Brakfontein wetlands scored very low on most of the typical ecosystem services provided by wetlands. Most of the regulating and supporting services provided by the wetlands are compromised by the fact that the wetlands are strictly ephemeral. Pan 1 however scored very high in the maintenance of biodiversity and moderately high in provision of food for livestock. The very high importance in the maintenance of biodiversity is attributable to the branchiopod communities that occur here, the suitable habitat the wetlands provide for the Near Threatened Giant Bull frog and the red listed waterbirds these wetlands would attract during periods of inundation. The grass species found in these systems increase their provision of food for livestock. Although they occur as dense stands in the wetlands, not many people are dependent on this resource.

The low scores for the provisional services are because all wetlands on Brakfontein lack the ability to directly supply water or medicinal plants. No crop farming, hunting, or fishing is possible in these systems either. The wetlands are not used as public tourism or recreation destinations and is not associated with any cultural practises or beliefs. The wetlands have also not been subject to research in the past and the fact that Brakfontein is situated in a rural area, relatively far away from the nearest academic institution, and has restrictive access control; lowers their importance for education and research.

Recommended wetland buffer zone

The aquatic buffer segment identified for the depressional wetlands on Brakfontein (Figure 23) have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human

use. For both pans, a pre-and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation. It is not clear if any prospecting activities are planned in or near these units, but the main impact risks are expected to be in the form of dust-fall that could increase the sediment input and turbidity of the wetlands. If pits are planned within the vicinity of the pans, then major associated impacts include increase in sediment inputs and turbidity, inputs of toxic heavy metal contaminants through possible petrochemical spills, as well as the alteration in pH. With effective mitigation, the impacts can be reduced and therefor the post-mitigation and final buffer requirements for these units are 35m.

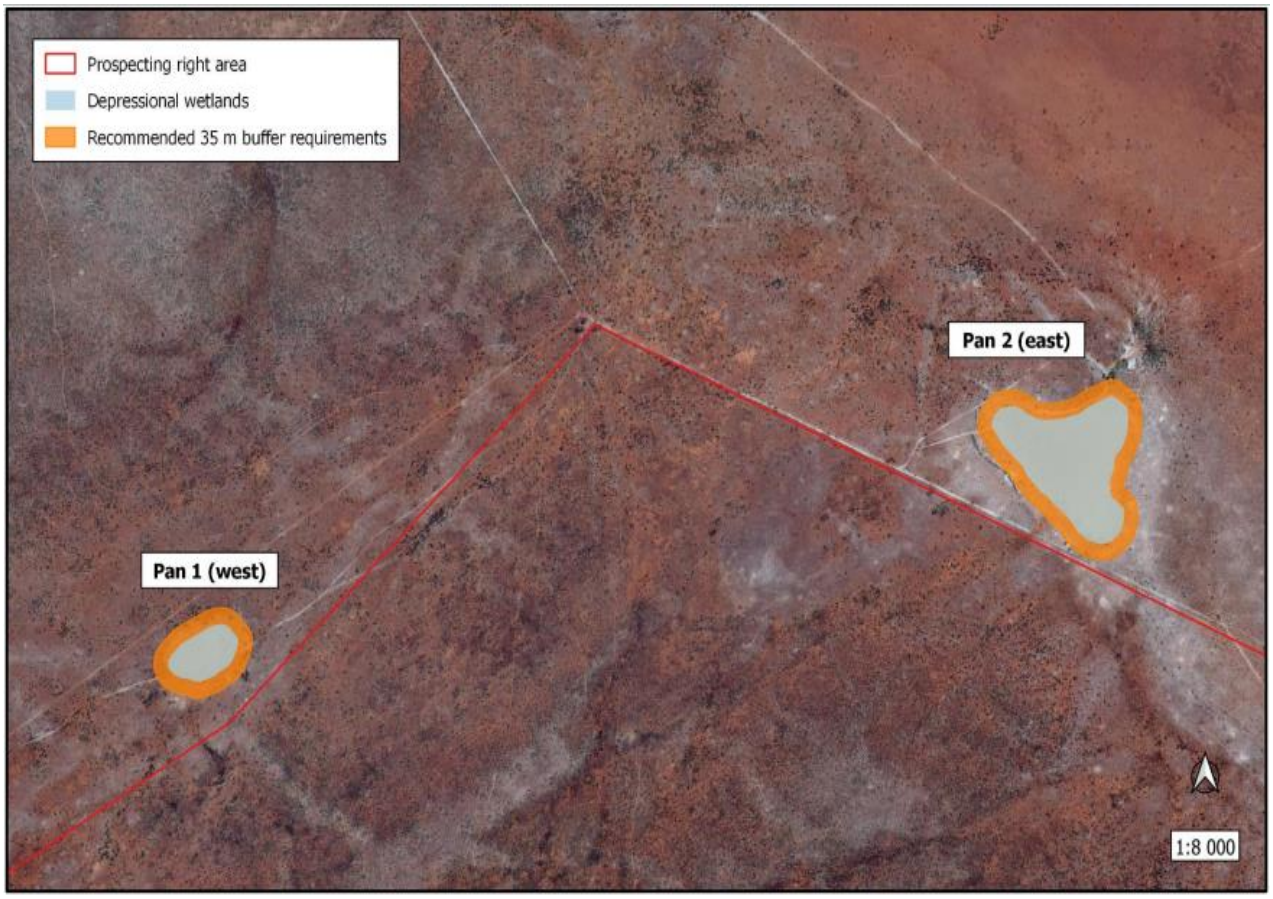


Figure 23. Final aquatic impact buffer requirements, including practical management considerations, for the depressional wetlands on Brakfontein.

*(9) **GROUND WATER:***

THE MEAN DEPTH OF THE WATER TABLE DURING SUMMER IS APPROXIMATELY 120 M AND DURING WINTERS 140 M.

Ground –Water Zone

It is not anticipated that ground water plays a significant role in the study area. The river is the primary source of water for most activities.

The area between Douglas and Prieska is criss-crossed by dolerite dykes which could act as barriers to water seepage from prospecting / mine sites. These thin impersistent dykes in the proposed prospecting area will not affect ground–water movement significantly. The depth of the boreholes is mostly very deep in the application area and precludes ground water being an important factor in the area.

Ground-water quality:
As a result of the low rainfall over the water management area, recharge of groundwater is limited, and only small quantities can be abstracted on a sustainable basis (ISP, 2004). Aquifer characteristics (borehole yields and storge of groundwater) are also typically unfavourable because of the hard geological formation underlying most of the water management area. Current utilization of groundwater in the water management area is approximately in balance with the sustainable yield from this source.

DWA considers the interaction between groundwater and surface water to be of concern. It should be noted that the extent of prospecting excavations seldom exceeds 20 m in depth therefor given the mean depth of the water table of approximately 120 m during summer and 140 m during winter operations does not reach the water table. Equally the identified depth implies that groundwater presently does not play a primary role in operations.

Ground-water zone:
The diamond bulk sampling does not affect the quality of the ground water in any manner. There are no harmful or toxic properties in the gravels being mined. The recycling of the water only requires sediment settling, thus no aquifers and aquicludes are on the property.

(10) *AIR QUALITY AND NOISE:*

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
The current source of air pollution in the area stems from numerous mining operations along the Orange River and from vehicles travelling

on the gravel roads of the area. Farming activity, especially ploughing of the irrigation fields, may generate dust during certain periods of the year. 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 opencast Prospecting process, the loading of gravels onto the transport trucks, the dumping of gravels over each sites primary screen or feeder bins 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.

The dust is controlled by watering down the roadway used by these trucks while bulk sampling. The mineral processing is a wet process; thus, no dust is generated.

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 large vehicles (tip trucks, front-end loader, back actor), from the working pan.

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 processing plant. Processing plant 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.

(11) VISUAL ASPECTS:

The prospecting site would possibly be visible form the secondary gravel roads on the farms. The negative visual impacts associated with open pits for the bulk sampling and the washing pan will however have a low negative impact since it will be visible to the landowners and can be visible from the secondary gravel road. There is however no method of reducing the impact during bulk sampling operations (operational phase), it can only be mitigation by doing concurrent rehabilitation of open pits as prospecting progress.

(12) AREAS OF CULTURAL-HISTORICAL OR ARCHAEOLOGICAL INTEREST

Dr Edward Matenga has been appointed by Wadala Mining to provide a Heritage and Palaeontological Impact assessment studies to highlight the heritage and palaeontological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the heritage and palaeontological diversity and status of the application area.

Heritage

This Heritage Impact Assessment (HIA) report has been prepared on behalf of Northern Spark Trading 428 (Pty) Ltd for a prospecting right application on the Remaining Extent of the Farm Brakfontein 276 in the Siyathemba Local Municipality, Northern Cape Province.

The heritage sensitivity of the property is summarised as follows:

The Stone Age

As a general observation, Stone Age material occurs in the Middle Orange River Valley as background scatters which are testimony to the foraging activities of stone age communities. This pattern was observed on the Farm Brakfontein 276 (Remaining Extent) where eight (8) out of 12 occurrences recorded were lithics. There was an occasional hand-axe (Site BKN12) probably dating to the transition from the Early Stone Age to the Middle Stone Age. Otherwise, the scrapers and blades, commonly

encountered date to the Middle Stone Age/Late Stone Age period. None of the sites recorded warrant further action.

The Early Iron Age
No material dating to the Iron Age was found.

The Later Iron Age
No material dating to the Later Iron Age was found.

Burial grounds
No burial grounds were found or reported on the property.

Modern commercial farming
Two rectangular stone enclosures were recorded (BKN03 & BKN05). There is no reason to destroy these structures that are likely to be treasured in the future as a footprint of the development of commercial farming in the karoo. The chassis of an American manufactured vehicle was also noted an asset that commercial farmers would own in the 1950s and 1960s (BKN04).

Palaeontology
Prof Marion Bamford from Wits University was sub-contracted by Archaeological and Heritage Services Africa (Pty) Ltd to conduct a Palaeontological Impact assessment study to highlight the palaeontological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the palaeontological diversity and status of the application area.

A Palaeontological Impact Assessment was requested for the proposed Prospecting Right Application on the Remaining Extent of the Farm Brakfontein 276 near Prieska in the Siyathemba Local Municipality, Northern Cape Province.

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 development.

The proposed site lies on the potentially fossiliferous Dwyka Group rocks, Tertiary Calcretes and Quaternary alluvium. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor,

environmental officer or other designated responsible person once excavations or mining activities have commenced. As far as the palaeontology is concerned, the impact is very low and the project should be authorised.

Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figure 24 for the SAHRIS map. The site for mining is in the Dwyka Groups rocks (green; moderate sensitivity) and the Tertiary-Quaternary calcretes (orange, highly sensitive).

The Dwyka Group tillites and mudstones can trap fossils that were caught up in the ice sheets or glaciers and dropped when the ice melted, therefore these fossils tend to transported fragments of more robust fossils such as silicified wood, invertebrate remains and rarely Glossopteris leaves or associated flora. Two rare occurrences are mentioned by Anderson and McLachlan (1976) near Strydenburg which is to the northeast of this site. There are no other reports. According to Johnson et al. (2006), the fossils are only likely to be found in mudstone facies of the Dwyka Group.

Exploration and research along the palaeo-rivers of Southern Africa, now only present as abandoned palaeochannels, or captured by the present day rivers, the Vaal and Orange Rivers in this case, the gravels and sands might include transported robust and fragmentary fossils. Examples of these are heavy bone fragments and silicified wood fragments, as well as diamonds (de Wit, 1999; de Wit et al., 2000).

The Tertiary calcretes can trap fossils and artefacts when associated with palaeo-pans or palaeo-springs (Partridge et al., 2006). Where deflation has occurred, for example along the west coast of South Africa, any trapped materials in the different levels can be concentrated in the depo-centre of the pan or dune and thus it can be challenging to interpret the deposit (Felix-Henningsen et al., 2003).

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.

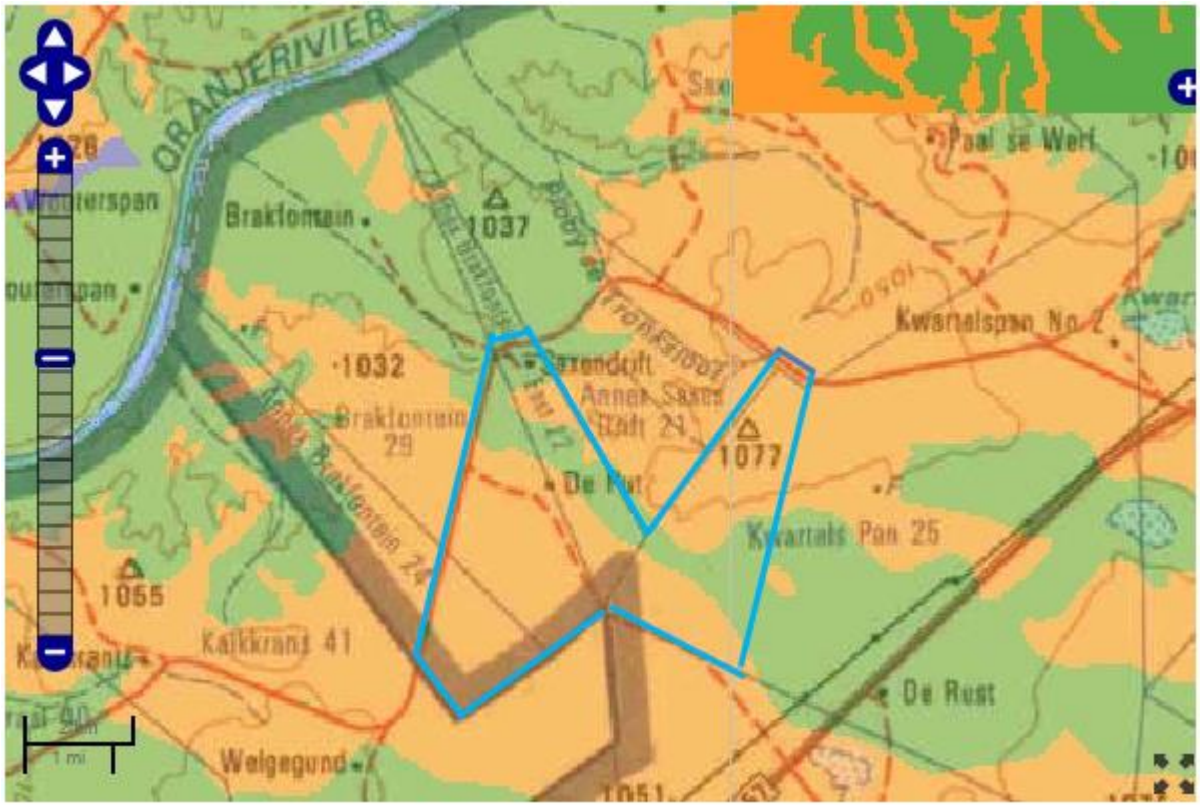


Figure 24. SAHRIS palaeosensitivity map for the site for the proposed PRA on RE of Farm Brakfontein 276 shown within the turquoise polygon. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

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 Dwyka Group tillites and sandstones or the sands and calcretes of the Tertiary-Quaternary. There is a very small chance that fossils may occur in features such as palaeo-pans or palaeo-dunes that could trap fossils are present as no such feature is visible in the satellite imagery. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the miners or environmental officer, or other responsible person once mining has commenced then they should be rescued, and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be low, therefore, as far as the palaeontology is concerned, the project should be authorised and a prospecting permit granted.

Chance Find Protocol

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

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.
2. When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (stromatolites, plants, insects, bone or coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the trace fossils such as stromatolites in the dolomites or the Quaternary bones, rhizoliths, traces. 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 contractor, environmental officer or miners then a qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Trace fossils, 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.

(13) ***TOPOGRAPHY, SOIL EROSION AND ASSOCIATED DEGRADATION OF ECOSYSTEMS:***

Three plant communities occur on site, including terrestrial and aquatic habitats. The two depressional wetlands are both considered to be of very high sensitivity due to their vital ecological and hydrological functionality and significance, which is portrayed in the various sections of this report. The calcrete terraces are of high sensitivity, primarily because of the high number of the nationally protected tree (Boscia albitrunca) that occur here and the suitable habitat and overlapping distribution range for protected birds. The grassland is of medium sensitivity.

The most profound impacts are expected to be related to the cumulative loss of natural terrestrial habitat on a landscape scale as well as the

removal of the nationally protected tree, Boscia albitrunca. A number of provincially protected species also occur on site. Before any of these species are damaged or removed, permits need to be obtained from the Northern Cape Department of Environment and Nature Conservation and/or Department of Agriculture, Forestry and Fisheries, at least three months prior to any clearance of affected species.

The wetland in the west is in a near-natural condition, with high ecological importance and sensitivity, while the wetland in the east has been moderately modified. The most profound functional importance of the wetlands relates to the maintenance of biodiversity in the form of unique habitats they provide for freshwater crustaceans. Even though rarely wet, these wetlands harbour egg banks of these specialised freshwater invertebrates in the dry sediment, which allows for the continuation of the species once the wetlands flood. Protecting the sediment in-situ is therefore vital. It is not currently known if the wetlands are within the core areas earmarked for prospecting, but before any direct activities can take place within a wetland, a water use licence needs to be obtained for Department of Water and Sanitation prior to such activities.

Soils of the study area have high wind erosion- crusting- and compaction susceptibility. Water erosion susceptibility is also high, but due to the arid climate water erosion risks are low.

(14) CRITICALLY BIODIVERSITY AREAS *BROAD-SCALE PROCESSES:*

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study 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, Broadscale Ecological processes was described and included in this report as part of the Ecological study (Appendix 4).

The proposed prospecting site falls within critical biodiversity areas, 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 as a whole. The ephemeral pan in the west, along with some calcrete terraces comprise of Ecological Support Areas, while the remainder of

the study area comprise of Other Natural Areas (Figure 25). No protected areas occur in or near the study site.

According to the Mining and Biodiversity Guidelines (DEA 2013) no area on Brakfontein has been classified with biodiversity importance. 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, according to the National Web based Environmental Screening Tool the study area is considered to have sensitive environmental features (Figure 26). 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 the screening tool, the Brakfontein study area is considered to be of low sensitivity based on the Plant species Theme but is considered to be of medium sensitivity based on the Animal Species Theme. This sensitivity is attributed to the suitable habitat and overlapping distribution range of the listed Ludwig's Bustard and Tawny Eagle, of which both are expected to occur here. Only the pan in the west is considered to be of very high sensitivity based on the Aquatic Biodiversity Theme. The same pan, along with the calcrete terraces in the west are of very high sensitivity based on the Terrestrial Biodiversity Themes, which is a direct function of the Ecological Support Areas on the Northern Cape Critical Biodiversity Areas Map.

According to the Pixley ka Seme Spatial Development Framework, all rivers and wetlands, including a generic buffer of 100m, are regarded as ecological corridors. Their mandate is to conserve existing ecological corridors and rehabilitate any remnants of corridors. Therefore, the pans on Brakfontein, including a 100m buffer should be conserved.

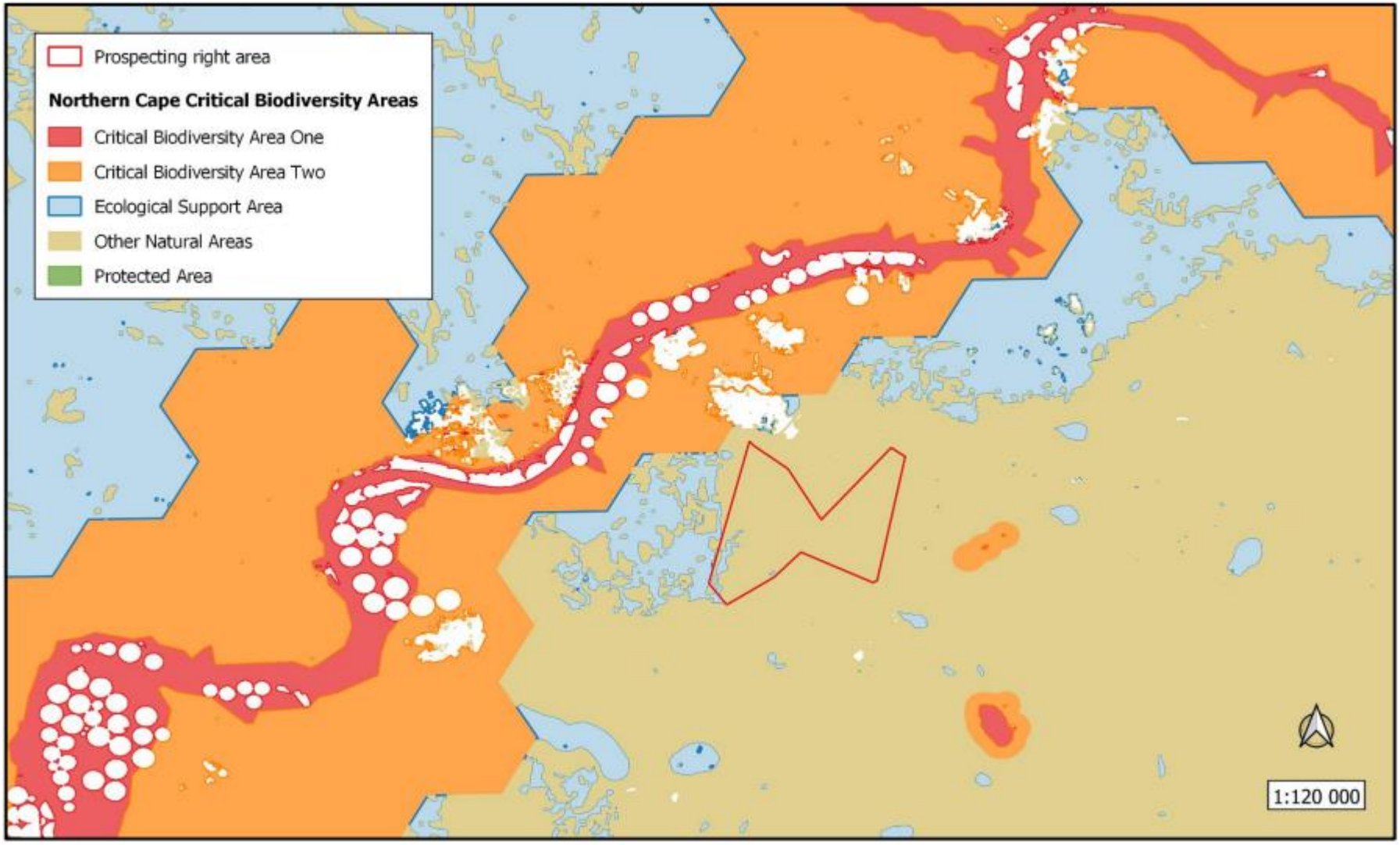


Figure 25. The study area in relation to the Northern Cape Critical Biodiversity Areas

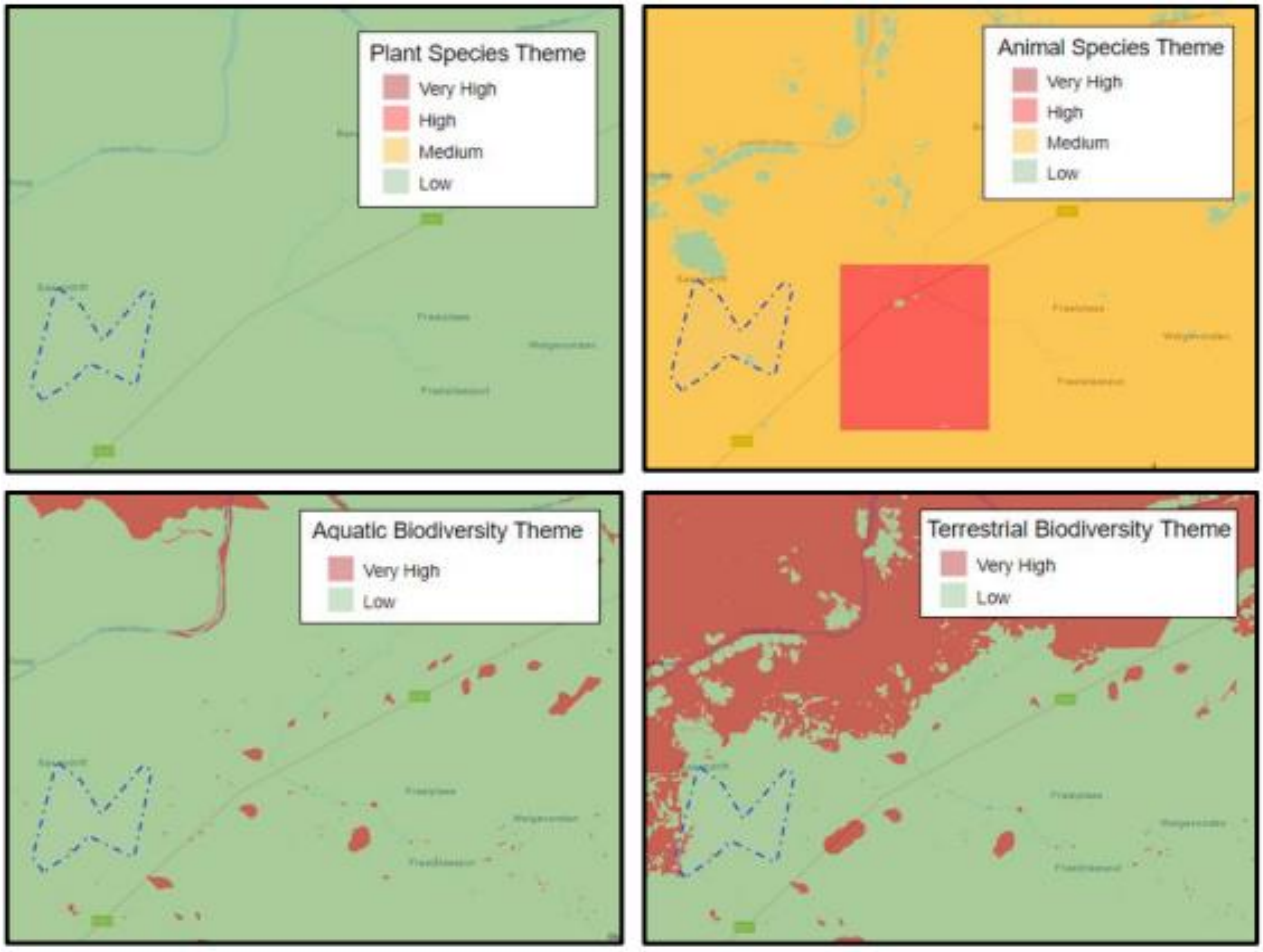


Figure 26. Environmental sensitivities in the study area, according to the National Web based Environmental Screening Tool.

Finally, the study area falls within a region where one of South Africa's largest economically most important alluvial diamond deposits are found (Figure 27), i.e. along the Orange and Vaal Rivers (Gresse 2003). The most significant crop irrigation in the Northern Cape also stretches along these rivers (Durand 2006). These factors increase the proposed operation's cumulative impacts. The Brakfontein prospecting activities are therefore expected to contribute to the cumulative effect of mining and habitat disturbances in the region.

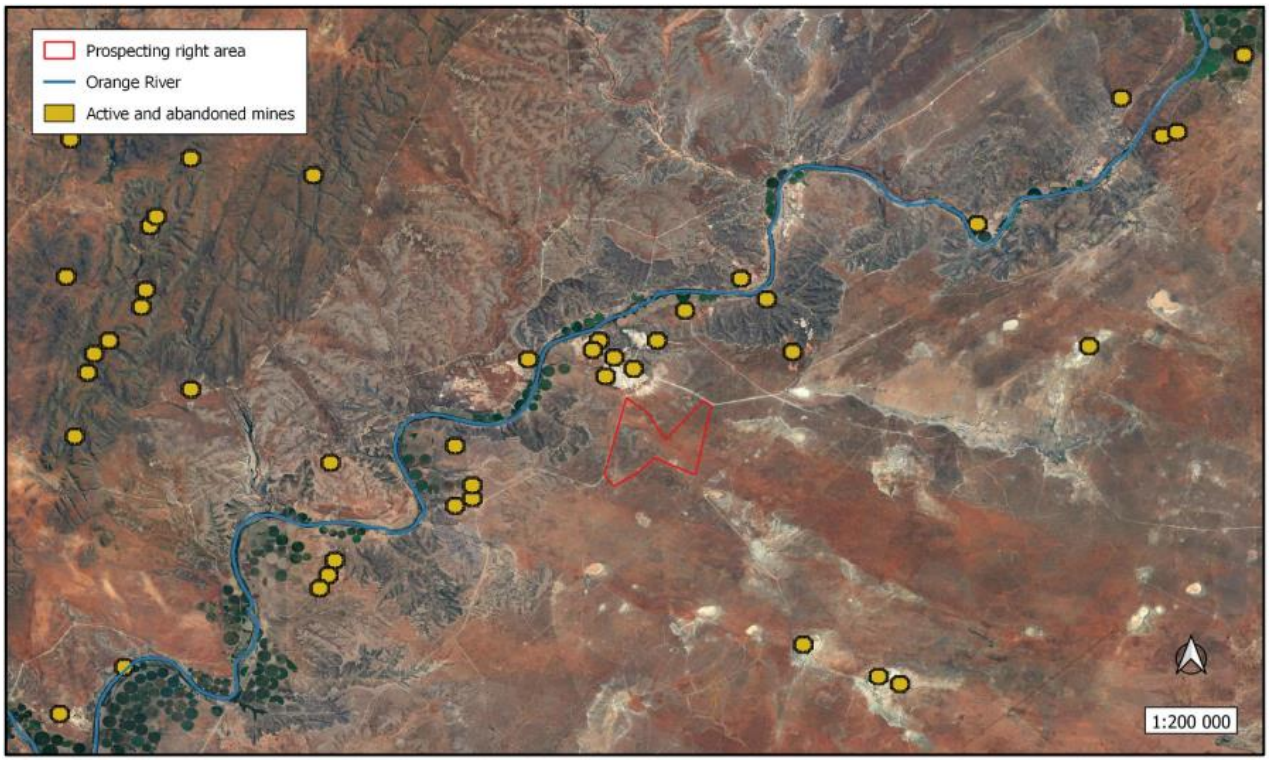


Figure 27. The distribution of mining properties and crop irrigation in the study region.

Site sensitivity

The sensitivity map for the Brakfontein prospecting operation is illustrated in Figure 30. The depressional wetlands (ephemeral pans), along with their buffer requirements are of very high sensitivity due to their vital ecological functionality and significance, which was discussed in this report. The wetlands, albeit intermittent, are also protected in terms of the National Water Act (Act No 36 of 1998) and are important ecological corridors according to the Pixley ka Seme Spatial Development Framework. They are therefore regarded as important features for the conservation of biodiversity and broad-scale ecological processes and are essentially no-go areas.

The calcrete terraces are of high sensitivity, primarily because of the widespread occurrence of nationally and provincially protected plant species, specifically Boscia albitrunca, as discussed in section 3.3.3 of the ecological study. Furthermore, these areas overlap with the distribution range of and provides suitable habitat for the red listed Ludwig's Bustard and Tawny Eagle (see section 3.4.4 of the ecological study). Although these units are not regarded as no-go areas, activities should only proceed with caution as it may not be possible to mitigate all impacts appropriately.

The grassland is considered to be of medium sensitivity. Although it also overlaps with the distribution range of those listed bird species discussed above, it does not harbour a significant population of plant species of conservation concern.

Impacts are likely to be largely local here and activities within these areas can proceed with relatively little ecological impact provided that appropriate mitigation measures are taken.

- **SOCIO-ECONOMIC STRUCTURE OF THE REGION:**

Thembelihle Local Municipality (formerly known as Oranje-Karoo Local Municipality) is a local municipality in the Pixley ka Seme District Municipality district of the Northern Cape province of South Africa. Thembelihle is a Xhosa name meaning "good hope", the new emblem depicts the diversity of Thembelihle inhabitants and its surroundings.

Geography, History and Economy
The municipality covers a total square area of 8 023km². Thembelihle Local Municipality is a Category B municipality situated in the heart of the Karoo in the Pixley Ka Seme District of the Northern Cape Province. It is one of the smaller municipalities of the eight that make up the district, accounting for only 8% of its geographical area.

This mostly agricultural landscape is rich in natural resources. The first diamond was discovered in Hopetown and a great part of the Anglo-Boer War was fought in these parts. It is primarily made up of Hopetown and Strydenburg.

Hopetown
Hopetown was founded in 1850 when Sir Harry Smith extended the northern frontier of the Cape Colony to the Orange River. A handful of settlers claimed ground where there was a natural ford over the Orange River, and by 1854 a frontier town had developed. Hopetown was named after William Hope, Auditor-General and Secretary of the Cape Colony Government at the time, and is often mistaken for a town in the Freestate, South Africa, called Hoopstad. Hoopstad is a different town and should not be confused with Hopetown in the Northern Cape, South Africa.

Hopetown was a quiet farming area until several large diamonds, most notable the Eureka Diamond and the Star of South Africa, were discovered there between 1867 and 1869. The Cape Government Railways were founded in 1872, and the Cape government decided to run the main western line, between the Kimberley diamond fields and Cape Town on the coast, directly through Hopetown. The ford was upgraded to a railway bridge in 1884.

Strydenburg
Strydenburg is seventy-seven km north of Britstown, it was laid out by the Dutch Reformed Church on the farm Roodepan in 1892. It also lies on the N12, which separates the actual town from its township. Strydenburg is 55km south-west of Hopetown and 75km north-north-west of Britstown. It was laid

out in 1892 on the farm Roodepan and attained municipal status in 1914. Dutch for 'town of argument',
the name refers to disagreement as to on which farm it should be situated.

Strydenburg is a typical semi-desert suburb which is quiet, peaceful and full of character. It is the ideal stop over for travelers as it is halfway between Cape Town and Johannesburg. Strydenburg offers tourists a complete relaxation time away from the city life. There are hiking trails nearby and the visitors enjoy canoeing and river rafting on the Orange River not far from Strydenburg.

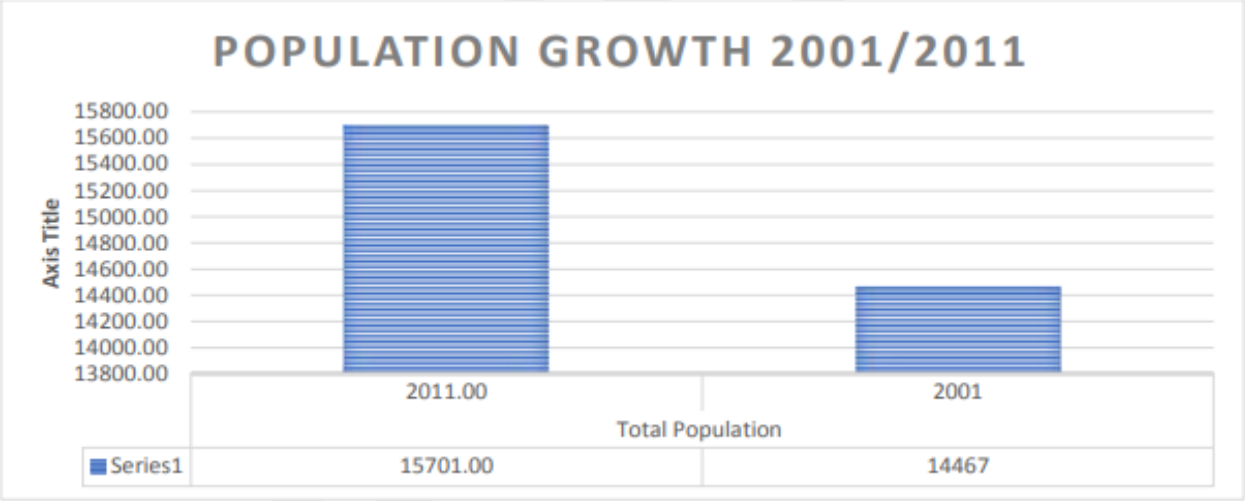
Strydenburg is in the Northern Cape and enjoys a semi-desert climate with hot to very hot and dry summer months and warm winter days with cool winter evenings. Most rainfall is during the winter months.

The demographics in Thembelihle

	2016	2011
Population	16 230	15 701
Age Structure		
Population under 15	25.0%	30.9%
Population 15 to 64	68.5%	62.8%
Population over 65	6.5%	6.4%
Dependency Ratio		
Per 100 (15-64)	46.0	59.3
Sex Ratio		
Males per 100 females	104.6	103.3
Population Growth		
Per annum	0.75%	n/a
Labour Market		
Unemployment rate (official)	n/a	28.4%
Youth unemployment rate (official) 15-34	n/a	35.2%
Education (aged 20 +)		
No schooling	10.8%	15.1%
Matric	22.2%	19.9%
Higher education	5.0%	6.6%
Household Dynamics		
Households	4 736	4 140
Average household size	3.4	3.7
Female headed households	32.4%	32.3%
Formal dwellings	77.4%	77.5%
Housing owned	51.0%	51.4%
Household Services		
Flush toilet connected to sewerage	66.4%	60.0%
Weekly refuse removal	59.4%	68.4%
Piped water inside dwelling	39.9%	33.5%
Electricity for lighting	84.2%	75.2%

Demographics in context

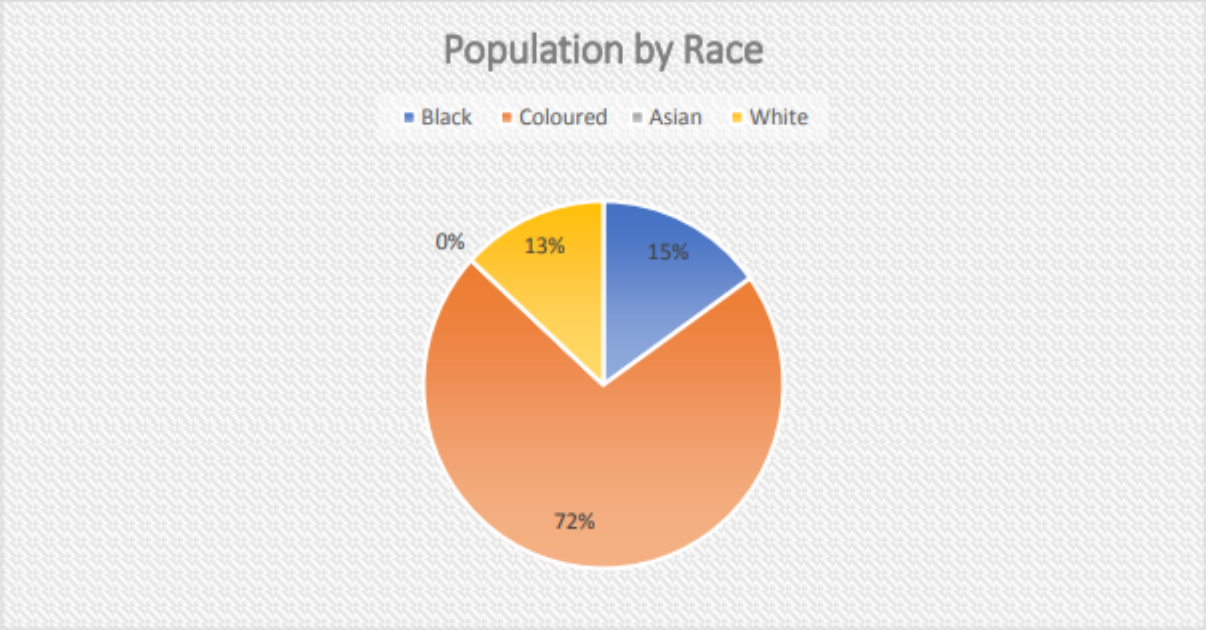
Demographics and key statistics



Graph 1: Population Growth 2001-2011

The population in Thembelihle has been on the rise. From the graph above, the population of Thembelihle has increased from 14467 in 2001, 15701 in 2011 and 16230 in 2016. There is an ever-increasing trend in the population growth and therefore this means there is pressure on the infrastructure- the water, electricity and sewerage networks of the municipality. The municipality will be further, burdened if no proper planning is done . There is a possibility for the

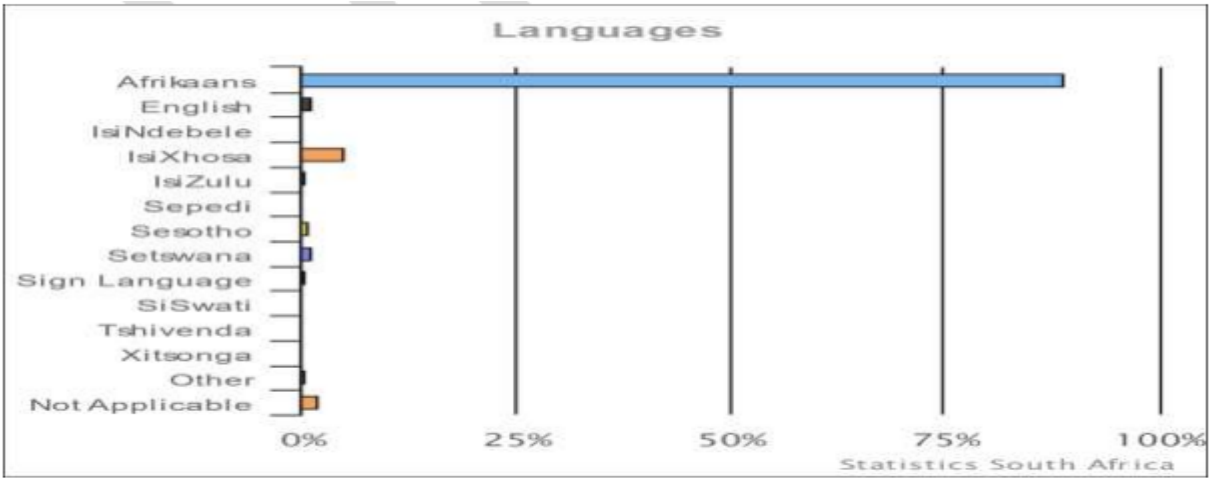
increase in the equitable share of the municipality and with proper planning even the grading for the Municipality.



Graph 2: The Thembelihle Municipality by race

From the graph above, it is evident that the largest section of the population is coloured population, with the white and black sections of the population being 2% apart from each other and with Hopetown being the most densely populated community and having the largest section of the White and African populations.

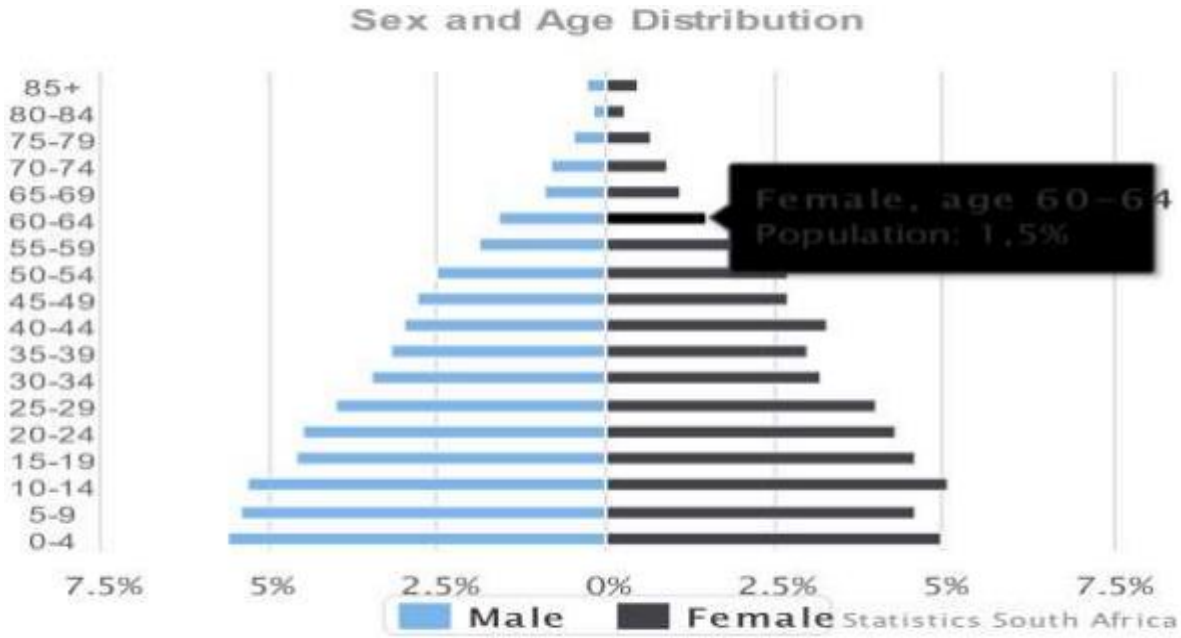
It is also important to appreciate that there is a need to understand the population dynamics from the perspective of the coloured population being the majority and as such programmes aimed at social cohesion should move from that appreciation. There is a slowly rising Asian population which is undocumented and needs to be included in the proper channels for registering populations.



Graph 3: Languages spoken in the municipal area.

Graph 3 represents the languages spoken in the area. This is key in understanding the community and assist in planning any community engagement. From the graph above, it can be noted that the most commonly spoken language in the area is Afrikaans and Xhosa a distant second and then English.

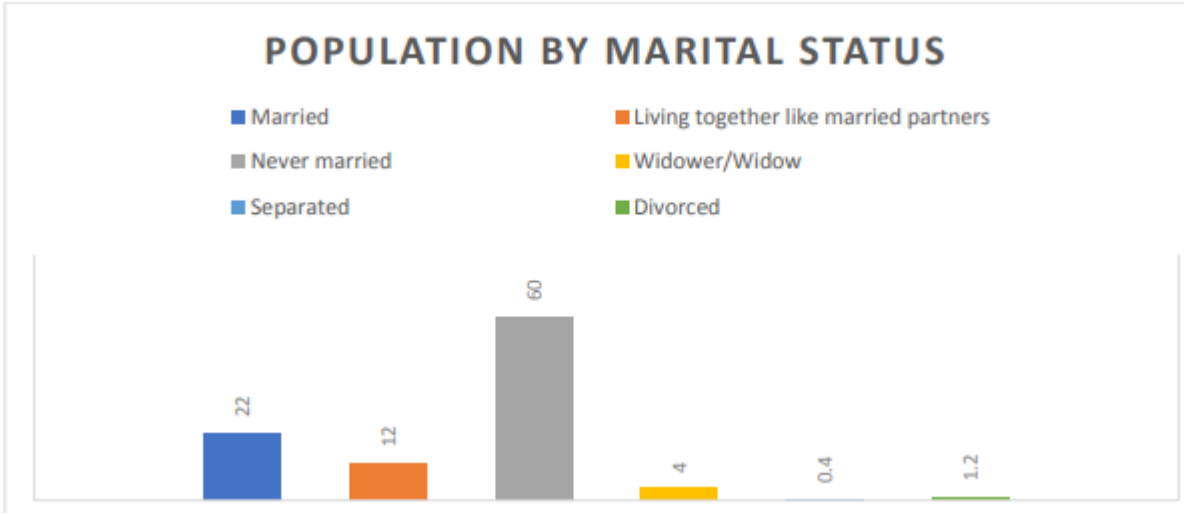
Further research that sought to contextualise the findings above, has revealed that the majority of people who speak IsiXhosa do not speak English as a second language but rather, Afrikaans as a second language. English is spoken by 0,5 percentage of the total population in the municipal area.



Graph 4: Population Age Sex Distribution

Graph 4, represents the population distribution of the municipality in terms of age and in terms of sex. From the graph above, there is evidence that there are more males that females in the Thembelihle Municipality. This is slightly different from the provincial and national norm in terms of male: female distribution. Very specifically, the male: female ratio increased from 103,3 males per 100 females in 2011 to 104,6 per 100 females.

The Thembelihle Municipality has a largely youth population with the greatest age ranges in the population being ages 0-34. This is further differentiated by the majority age being in the ages 0-14. It is also worth noting that there is a great pensioner age, 65 and greater.

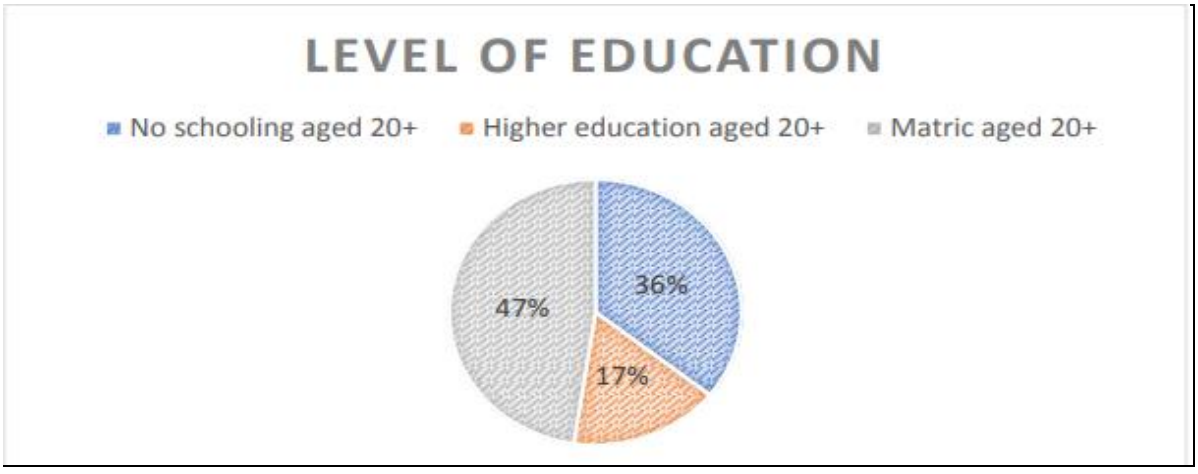


Graph 5: Population by Marital Status

The largest section of the population is the population that has never been married
or leaving like married partners, this implies:

- There is a need to understand the population dynamics in the area, will tend to be like those of broken families
- There will be common problems like drug abuse, women abuse and crime and in particular unorganized (petty) crimes
- There is a likelihood of domestic violence too

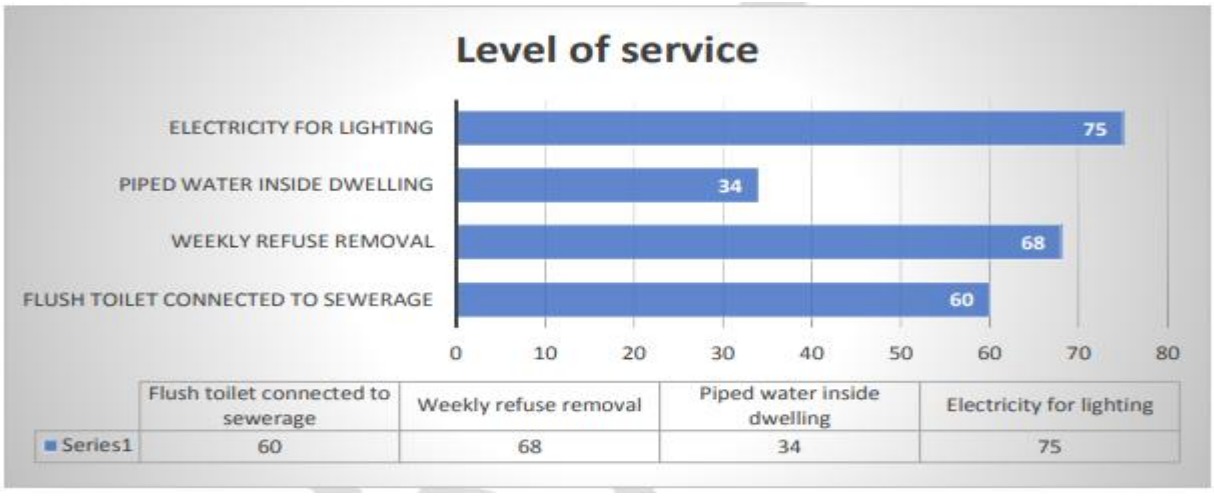
Development and Service Delivery Statistics



Graph 6: Education Levels in the Population over 20

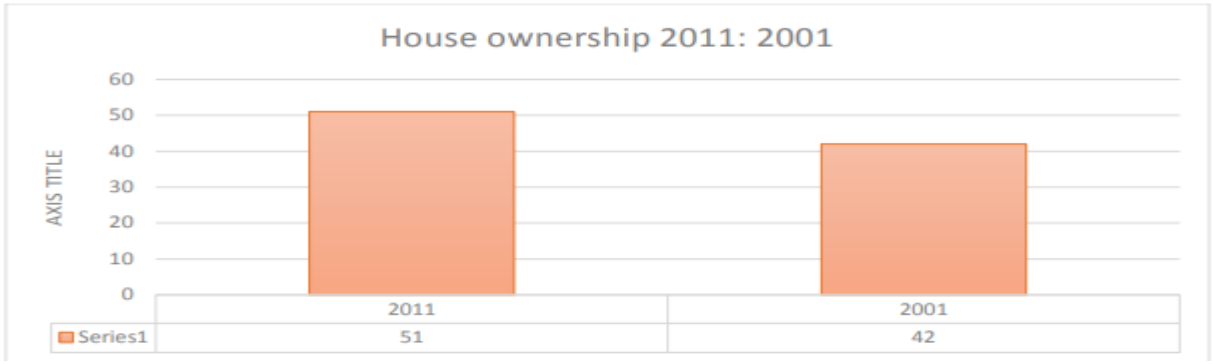
From the graph above, about 83% of the population aged 20 and above have no more than matric. Furthermore, 36% of this 83% never attended school. This means that:

- There is currently interventions in place to upskilling these sections of the population
- There is also a need to design low to semi-skilled jobs in order to accommodate these sections of the population.

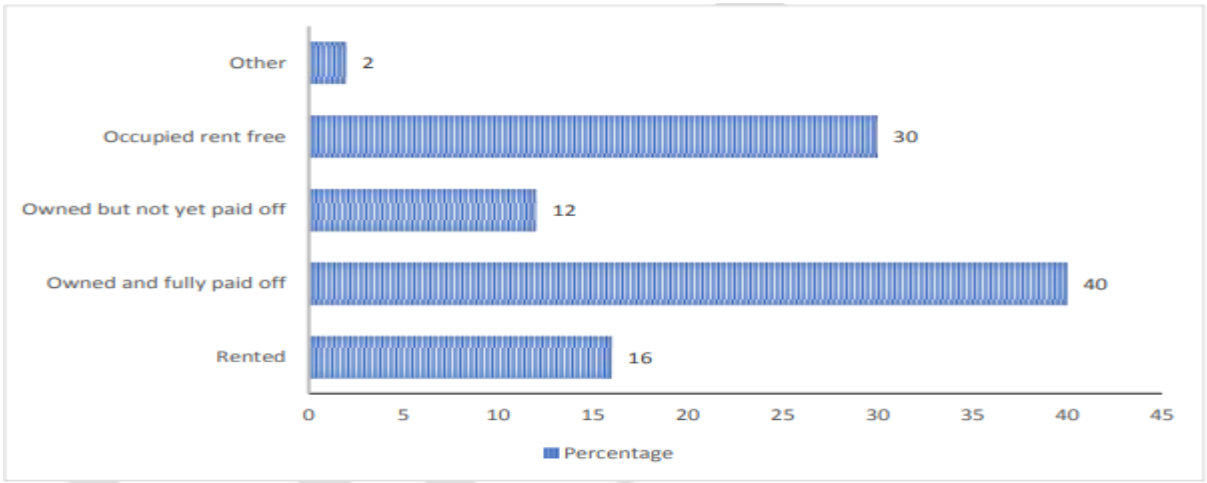


Graph 7: Level of service in the Thembelihle Municipality

Graph 7 above depicts the level of service in the municipality. From the graph above, the key basic service delivery commodities are accounted for. Electricity is supplied in the most effective manner in the municipality and water in the yard the least. Some encouragement is provided by the fact that there is weekly servicing of households related to refuse removal.



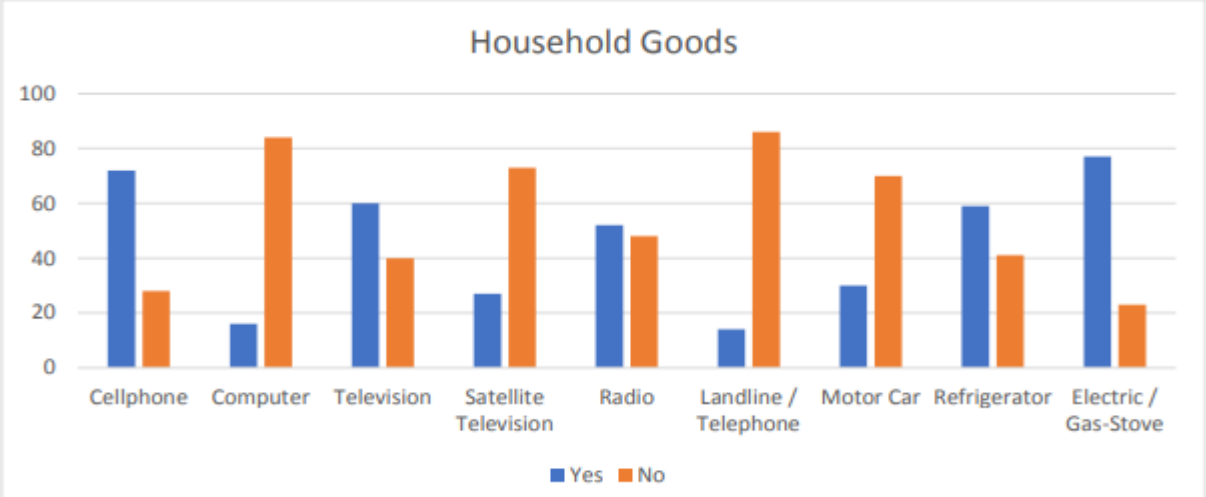
Graph 8: House ownership in Thembelihle



Graph 9: Household Tenure Status

From the two graphs above, it can be understood that the number of people owning houses in the municipality is on the increase. This points to a level of success in the government's housing programme. Linked to this is the level of and or the household tenure status.

The largest section of the houses owned in the Thembelihle Municipality owns the property and it is fully paid. This in particular bodes well for the programme that is aimed at ensuring that the community's human dignity is restored. There is a sizeable number of tenants that are occupying property rent free, this speaks to outstanding process of transferring the title deed to the rightful owners of the properties.

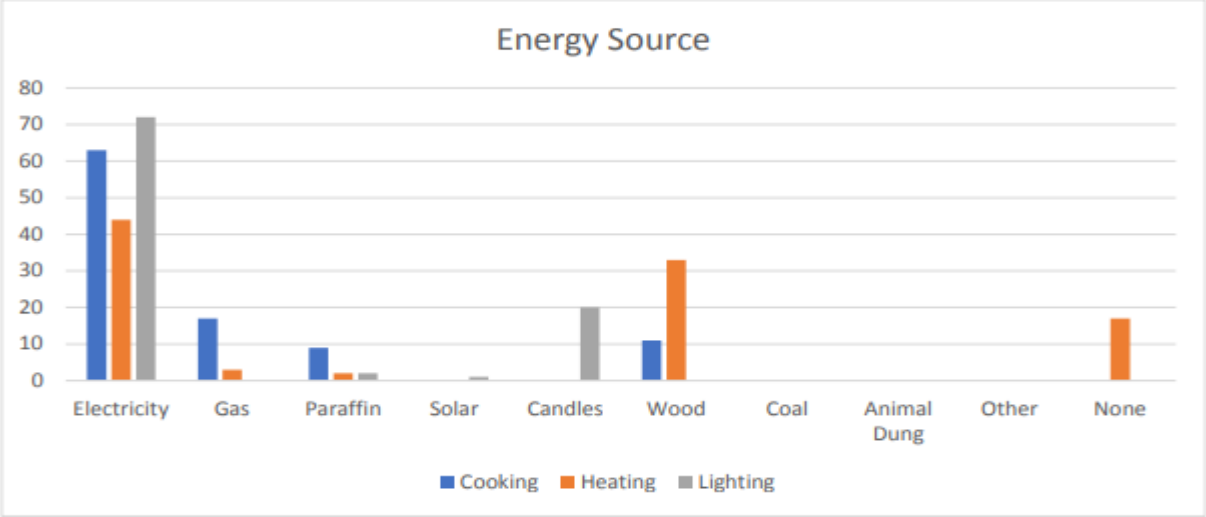


Graph 10: Household goods utilized

The goods utilized index seeks to get a sense of the day to day life of the ordinary residents in an area. To this extent, the household goods index in the municipality is as follows in order of the greatest utility and descending order.

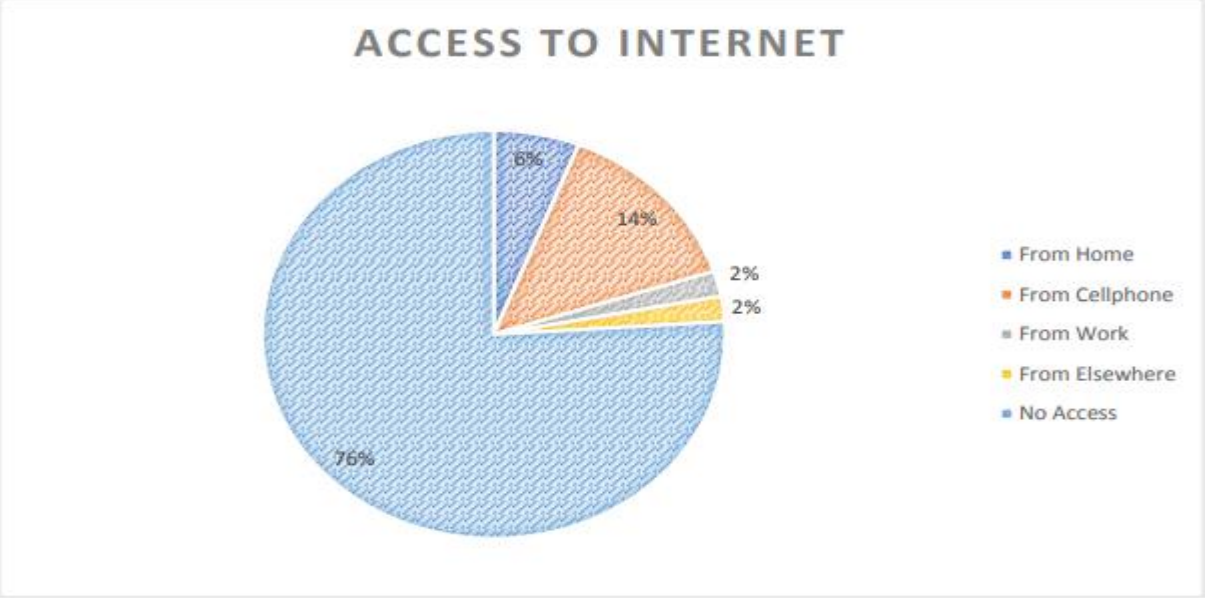
1. Electric/ gas stove
2. Cellphones
3. TV
4. Fridge
5. Radio
6. Car/Motor vehicle
7. Satellite Television
8. Landline telephone

The analysis above, is a clear indication that the electric stove is popularly used for cooking and sustenance purpose by the community at large. The use of cellphones in the South African market in general and in Thembelihle in particular, is telling of the impact of technology in our lives and the communities at large. It is worth noting that the landline has lost its significance in terms of the goods used in the municipality.



Graph 11: Energy Sources in the municipality

A great number of households in the area are using electricity to cook, light and heat up their houses. It is also important to note that there are some houses that don't have means of heating during winter. The second most of popular means of cooking, heating and lighting is paraffin second to electricity.

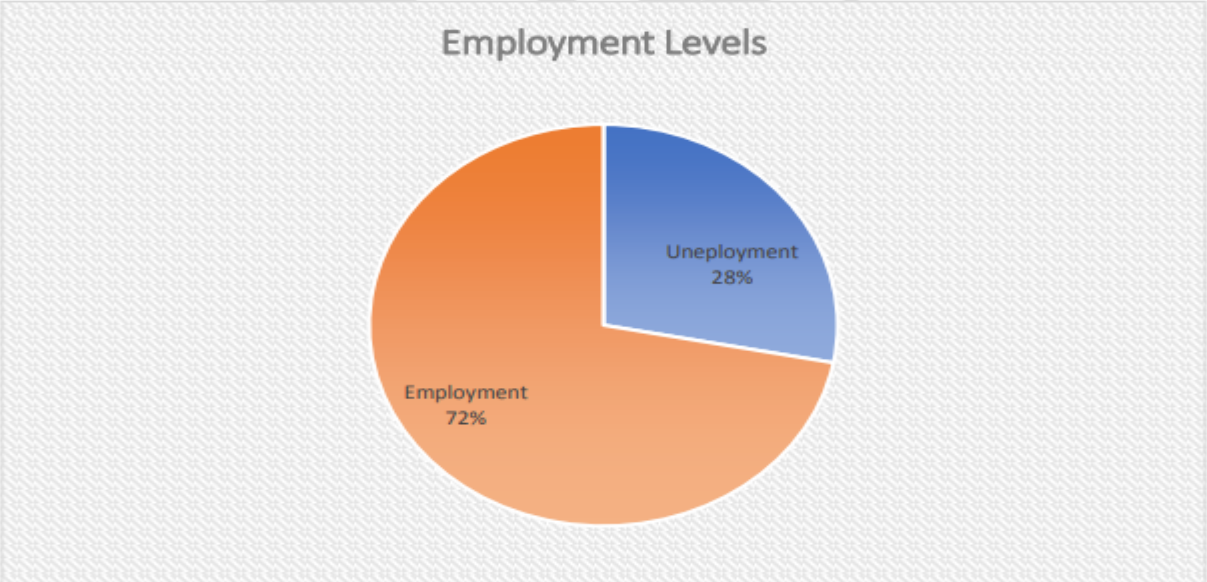


Graph 12: Access to internet in the municipality

The emergence of the digital of the digital platform has seen the increase in the demand for internet services. This not as a "nice to have" but an absolute necessity. According to this graph above, the Thembelihle Municipality has the great majority of its population without access to the internet. This majority is 76% of the population and next to that is 14% that accesses the internet from their cellphones. Next in line is that section of the population that accesses the internet from home. This accounts for 6% of the total Thembelihle population.

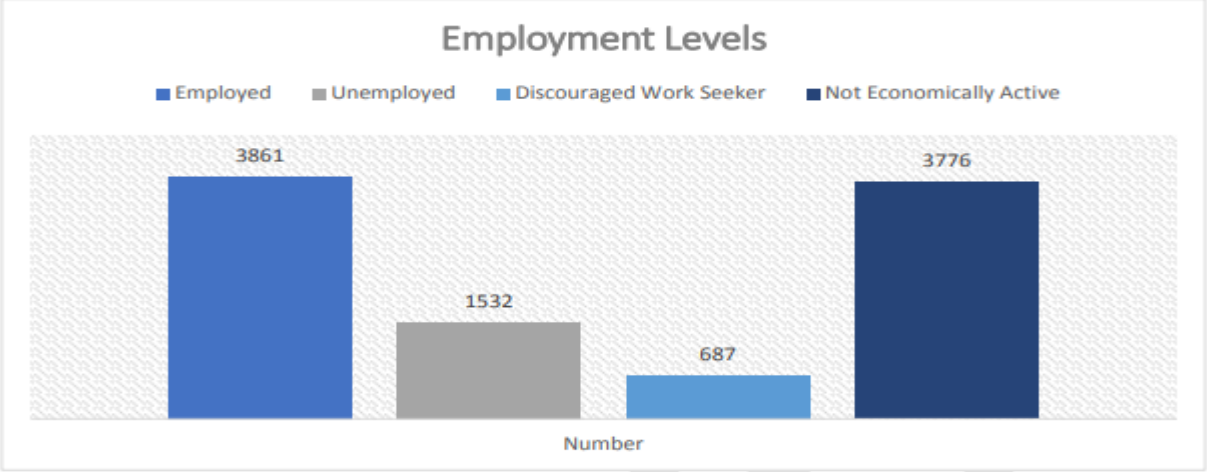
Employment and Economic Statistics

It is important to start this section, by defining employment. Employment can be defined as an economic situation where there is no cyclical or deficient-demand unemployment.



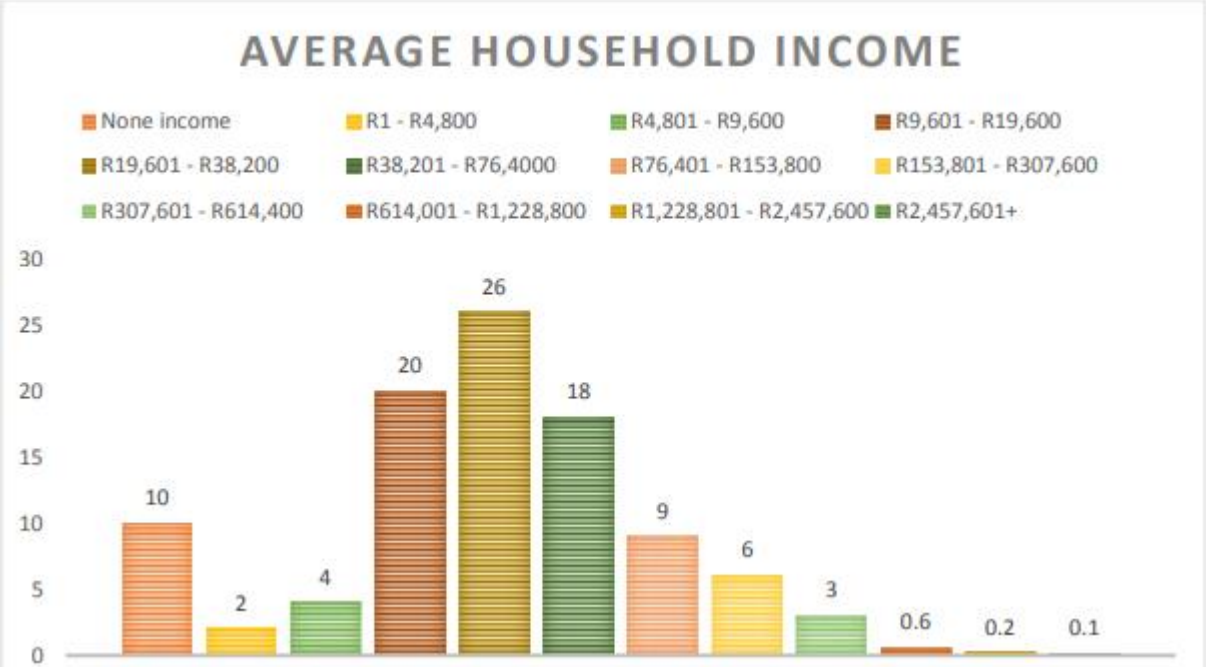
Graph 13: Employment situation in Thembelihle

Graph 13 depicts that of the economically active population, 72% of that section is employed and 28% unemployed. This is a very good variable in light of a 43% provincial unemployment figure. Whilst this is a good reflection, more can be done and the efforts can be directed towards the ensuring sustainable jobs.



Graph 14: Employment levels

Graph 14, further supplements the employment situation above and further qualifies the definition of employment. From this graph, the total number of employed people is 3861 and the total number of unemployed people is 1532. The number of discouraged work seekers is 687. The combination of discouraged work seekers and the unemployed population is close to 2 200 workers.



Graph 15: Average household income in Thembelihle

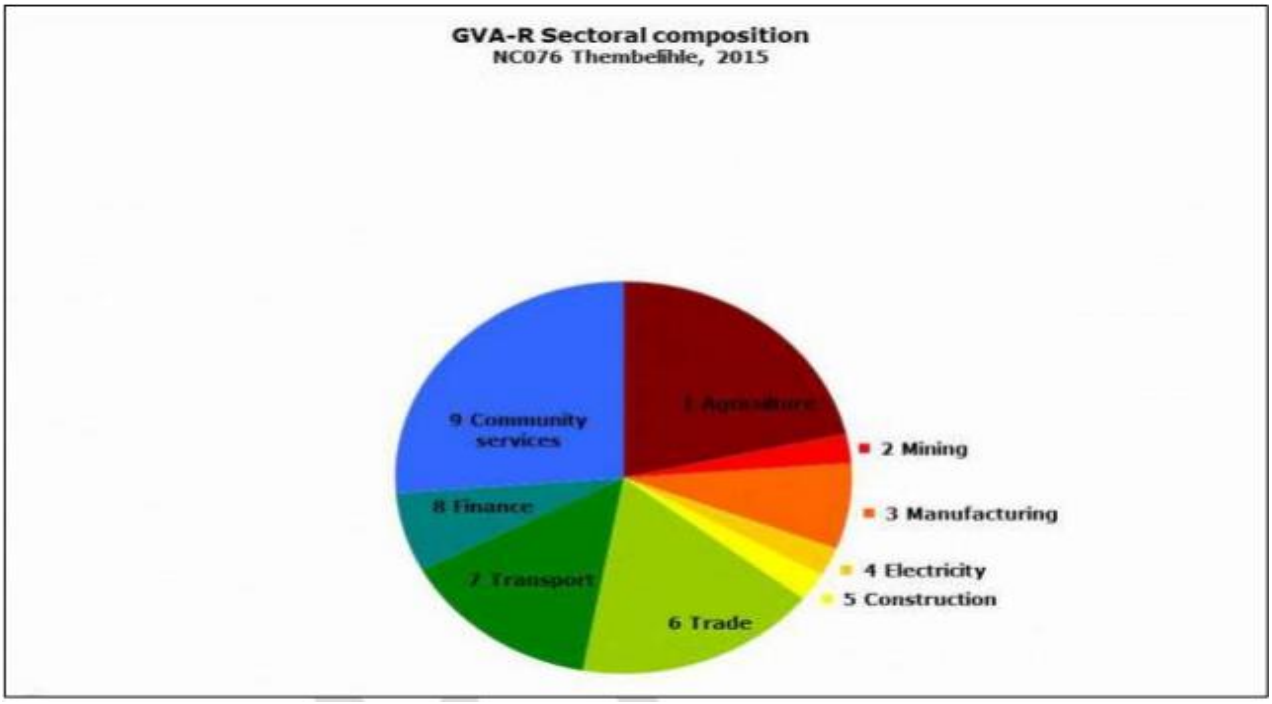
From graph 15 above, the highest number of households are in the middle to higher income strata. In this regard, they earn in the ranges of R307 614 400 to R 2 452 601. This means that there is a thriving middle class in the Thembelihle Municipal area. There is a 0,6% of earners in the above R 2 452 601 bracket.

ECONOMIC STATUS QUO

With a GDP of R 1.17 billion in 2015 (up from R 529 million in 2005), the Thembelihle Municipality contributed 10.74% to the Pixley ka Seme District Municipality GDP of R 10.9 billion in 2015. Although most of the arid towns have grown in size since 2000, due to immigration, and because of the South African social grant system (which encourages people to stay where they are). But the urban economy of the arid areas is very fragile.

Typically, the business sector is small, and there is virtually no industrial base. This is true for Thembelihle because the business sector consists mainly of the Cooperative, which is also the biggest employer, with branches in all the towns and general dealers such as food outlets, butcheries, hotels, guest houses and garages.

The Thembelihle Local Municipality's economy is made up of various industries. The GVA-R variable provides a sector breakdown, where each sector is measured in terms of its value added produced in the local economy. The summary table below puts the Gross Value Added (GVA) of all the regions in perspective to that of the Thembelihle Municipality. Thembelihle Municipality's economy is however less diversified in terms of its economic activity spread, than the province's economy as a whole.



Graph 16: GVA Sectoral Composition

In 2015, the community services sector is the largest within Thembelihle Municipality accounting for R 269 million or 26.3% of the total GVA in the local municipality's economy. The sector that contributes the second most to the GVA of the Thembelihle Local Municipality is the agriculture sector at 21.4%, followed by the trade sector with 17.3%. The sector that contributes the least to the economy of Thembelihle Municipality is the electricity sector with a contribution of R 24 million or 2.34% of the total GVA.

The comparative advantage (CA) of a region indicates a relative competitive production function for a product or service in that specific economy compared to the aggregate economy. An indication of the CA of an economy is its location quotient.

The location quotient is a calculated ratio between two economies. In the case of the Thembelihle Municipality, the location quotient was determined between the LM and the Pixley Ka Seme DM.

For 2015 Thembelihle Local Municipality has a very large comparative advantage in the agriculture sector. The transport sector also has a comparative advantage. The trade also has a comparative advantage when comparing it to the South Africa economy, although less prominent.

The Thembelihle Local Municipality has a comparative disadvantage when it comes to the mining and finance sector which has a large comparative disadvantage. In general mining is a very concentrated economic sector. The Thembelihle Local Municipality area does have some mining, but this is very limited and unimportant.

Most of the agricultural economy consists of extensive farming (sheep and goats), as well as a growing number of game farming operations. However, there is intensive agriculture along the Orange Riet Canal System, along the upper Orange River (Colesberg-Hopetown area), and along the middle Orange River area. Hopetown is a centre of irrigation farming.

(b) Description of the current land uses

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

The Brakfontein site is situated in a rural area, with major land uses in the region including mining and agriculture. According to AGIS, the land capability for the study site is primarily non-arable but is suitable for grazing. The agricultural region is demarcated for sheep farming, with the grazing capacity estimated at 32 Ha/LSU.

Currently, the property is primarily used for grazing by livestock and wildlife. Existing infrastructure includes old homesteads, farm tracks and grazing camps. (Information taken out of the ecological study by Boscia Ecological Consultants Dr. Betsie Milne Appendix 4).

(2) Evidence of Disturbance: -

The buffer zones and catchment areas of both pans are primarily still in pristine condition, with only a few impact sources, such as roads and general surface disturbances. The most significant direct modifications to both pans have occurred through the infestation of alien invasive plants, which dominate the pans and have significantly affected their vegetation impact score, due to the loss of indigenous vegetation.

Another major impact in Pan 2 is past cultivation practises, which has significantly affected its geomorphology impact score. Deposition of material in Pan 1, assumingly to create a dam to retain rainwater for livestock has affected its geomorphology and water quality but only to a very small degree. Minor surface disturbances also occur through farm roads that cut through the pan, altering its surface roughness and flow regime. However, these low-level modifications do not have a significant effect on the overall PES of the pan.

(3) Existing Structures: -

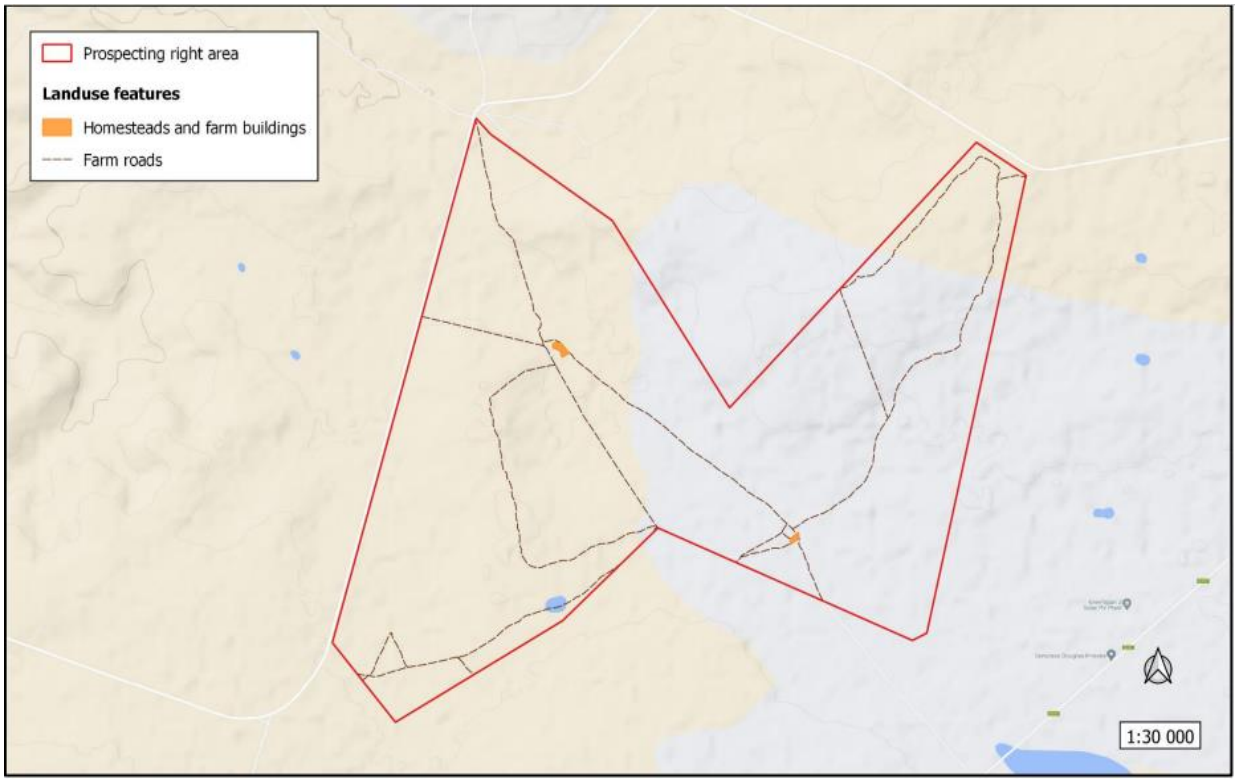
Existing infrastructure includes old homesteads, farm tracks and grazing camps.

(c) Description of specific environmental features and infrastructure on the site

The infrastructure on site is comprehensively discussed in section d(ii) as part of the prospecting methodology discussion, as well as in section g as part of the prospecting footprint description. Furthermore, a comprehensive description of the environment was presented in section g (iv) (A) as part of the baseline report.

(d) Environmental and current land use map

(Show all environmental, and current land use features)



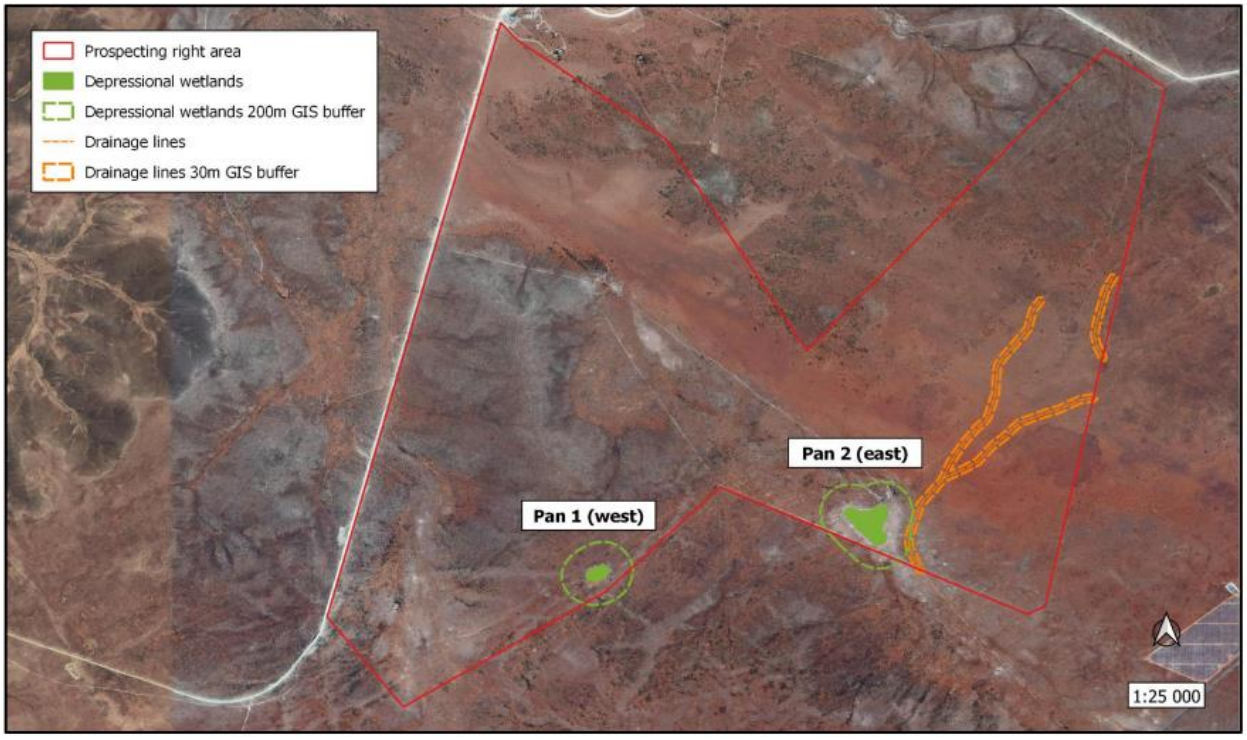


Figure 28. Environmental and current land use map

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

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

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
PHYSICAL						
Geology and Mineral Resource	Sterilisation of mineral resources	Very low	Highly unlikely	Residual	insignificant Local	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography Development of infrastructure; and residue deposits.	Low Medium	Possible for life of Operation	Residual	Low Local	• Prospecting continuously, if possible and does not influence prospecting and safety requirements. • Employ effective rehabilitation strategies to restore surface topography of prospecting areas and plant site. • Stabilise the mine residue deposits. • All temporary infrastructures should be demolished during closure.
Soils	**Increase in Soil Erosion**	Low - Medium	Possible frequently	Decommissioning	Low Medium Local	• Bare ground exposure should be always minimised in terms of

	During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, natural events. Vegetation will be stripped for construction of new roads and prospecting areas and these areas will be bare and highly susceptible to erosion. Any topsoil, overburden- and ore stockpiles can be eroded by wind, rain and flooding. Exposed sediments in the ephemeral wetland catchments can be carried away during runoff causing downstream sediment deposition and changing the					surface area and duration. • Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased. • No new roads, infrastructure or prospecting areas should be developed over the wetlands. • Disturbances during the rainy season should be monitored and controlled. • Any potential run-off from exposed ground should be controlled with flow retarding barriers. • Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

	geomorphology of the water resources. Any leaking pipes can also cause additional water erosion.					
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Loss of topsoil and soil fertility During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling. Topsoil contains living organisms that naturally regulate the ecological functioning of a habitat. Therefore, any disturbances to the intact soil profile can result in soil sterilisation which will directly affect vegetation communities. Apart	Medium - High	Certain for life of operation	Residual	Low Medium On-site	• Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas. • These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions. • Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired. • Topsoil must not be handled when the moisture content exceeds 12 %.

	from the direct disturbances caused by the prospecting activities, loss of soil fertility can also occur through soil compaction by dump loads as well as heavy machinery and vehicles.					• Topsoil stockpiles must by no means be mixed with sub-soils. • The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil. • For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment. • To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction. • Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
	Nature of Impact	Significance	Probability	Duration	Consequence	Management / mitigation

					Extent	
	Alteration of soil character and quality During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, oil and petrochemical spills. Topsoil contains living organisms and seed banks that provide ecological resilience against disturbances, and any disturbances to the intact soil profile will change its ability to sustain natural ecological functioning. Vehicles and prospecting equipment may potentially leak hazardous fluids on the soil surface,	Medium - High	Certain for life of operation	Residual	Low-Medium On site	• Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas. • These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions. • Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired. • Topsoil must not be handled when the moisture content exceeds 12 %. • Topsoil stockpiles must by no means be mixed with sub-soils. • The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank

	which will cause soil pollution. Apart from the direct disturbances caused by the prospecting activities, soil compaction by dump loads as well as heavy machinery and vehicles will causes a decrease in large pores, and subsequently the water infiltration rate into soil.					contained within the topsoil. • For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment. • To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction. • Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings. • Vehicles and machinery should be regularly serviced and maintained. • Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. • Drip trays must be available on site and

						installed under all stationary vehicles. • Spill kits to clean up accidental spills from any accidental spillages must be well-marked and available on site. • Workers must undergo induction to ensure they are prepared for rapid clean-up procedures. • Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of fertility.	Low-Medium	Possible for life of operation	Residual	Low-Medium On-site	• Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation	Low-Medium	Possible for life of operation	Residual	Low Medium On-site	• Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Ground Water Quantity	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation

	Hydrocarbon spills from vehicles and fuel storage areas may contaminate the groundwater resource locally	Low-Medium	Possible for life of operation	Residual	Low-Medium Local	• Staff at Workshop areas, yellow metal laydown zones and fuel storage areas should be sufficiently trained in hydrocarbon spill response. • Each area where hydrocarbons are stored or likely to spill should be equipped with sufficient spill response kits and personnel, contaminated soil should be disposed of correctly at a suitable location.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
Surface Water	**Alteration /destruction of watercourses** During excavation of minerals, construction of infrastructure and roads, stockpiling. Direct prospecting within the wetlands on site as well as	Medium - High	Possible infrequent	Permanent	Low -Medium Regional	• All activities associated with the prospecting operation must be planned to avoid any disturbances to the watercourses and their recommended buffer zones. • No new roads should be created across the wetlands and no prospecting should take

	development of roads, infrastructure or stockpiles within their active zones, catchment areas, or buffer zones can completely change the hydrologic regime, geomorphology, water quality and habitat conditions of the wetland, which will compromise their ecological functioning and status.					place in them. If this is unavoidable, a water use license to alter its beds and banks should be obtained from DWS prior to such activities. • If any of the ephemeral wetlands will be excavated, it is vital that the top 5cm of the sediment, which contains the egg banks, be removed prior to such activities, and stored in a suitable location where it cannot be eroded by wind or rain or be compacted or crushed. These egg banks should then ideally be used to restore wetland characteristics if possible, during the rehabilitation phase. However, if this is not possible, the egg banks should be donated to the Albany Museum in Grahamstown, where the freshwater collection of South Africa is housed. • Employ sound rehabilitation measures

						to restore characteristics of any affected watercourses.
	Siltation of surface water During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, natural events. Vegetation will be stripped in preparation for the prospecting areas and associated infrastructure. These bare areas will be very susceptible to wind and water erosion without plants to stabilise the soil, creating potential sediment source zones. High runoff events	Low Medium	Possible infrequent	Residual	Low Regional	• Bare ground exposure should always be minimised in terms of the surface area and duration. • Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased. • No new roads, infrastructure or prospecting areas should be developed over the wetlands. • Disturbances during the rainy season should be monitored and controlled. • Any potential run-off from exposed ground should be controlled with flow retarding barriers. • Regular monitoring during the prospecting operation should be carried out to identify

	could potentially cause the ephemeral wetlands to be filled with silt from prospecting areas if the sediment source zones lie along the drainage paths towards these water resources. Wind can also carry dust from the prospecting site to the wetlands, increasing siltation risks. This may lead to a change in hydrologic regime, water quality, character and PES of the wetlands.					areas where erosion is occurring; followed by appropriate remedial actions. • Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on wetlands in the adjacent areas. • Develop an effective dust suppression system to limit dust fallout risks.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Indigenous Flora	**Loss of and disturbance to indigenous vegetation** During clearing of an area for the excavation of	Low - Medium	Certain for life of operation	Residual	Low Medium On-site	• Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.

	minerals, construction of infrastructure and roads, stockpiling. The Brakfontein prospecting activities are expected to destroy a large area of natural vegetation. It is expected that the ecological functioning and biodiversity will take many years to fully recover. Vehicle traffic and prospecting activities generate lots of dust which can also reduce the growth success and seed dispersal of many small plant species in the adjacent pristine areas.					• Implement effective avoidance measures to limit any activities in the highly sensitive areas, by applying the no-go principles. • Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on plants in the adjacent pristine areas. • Develop an effective dust suppression system to limit dust fallout risks. • Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings. • The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas. • Apply for permits to authorise the large-scale clearance of indigenous plants from DENC at least three months before

						such activities will commence.
	Loss of Red data and/ or protected floral species Removal of plant species of conservation concern during clearing of an area for excavations, construction of infrastructure and roads, stockpiling. Intentional removal of plant species for non-mine related purposes, e.g. illegal plant trade, fire-wood, medicinal, ornamental use. There are a number of plant species of conservation concern present on the Brakfontein Prospecting Right area as discussed in section 3.3.3 of the ecological report.	Medium - High	Certain for life of operation	Residual	Low-Medium On-site	• The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation. • These plants should be identified and marked prior to intended activity and should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated if possible. The relevant permits from DAFF / DENC should be obtained at least three months before such activities will commence. • The setup of a small nursery is advisable to maximise translocation and re-establishment

	Many of the species are found in the core prospecting area and therefore it is likely that the prospecting operation will impact on their population dynamics. The most significant concern is the loss of Boscia albitrunca recruits. Saplings are rarely visible during clearance operations and therefore the Younger populations often get wiped out. Furthermore, any illegal harvesting of any other protected plants for whatever reason by staff, contractors or secondary land users could have devastating effects on the population of these species.					efforts of all the rescued plants. • 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. • The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and 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.

						• All those working on site must be educated about the conservation importance of the flora occurring on site as well as the legislation relating to protected species. • Employ regulatory measures to ensure that no illegal harvesting takes place.
	Introduction or spread of alien species During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, improper rehabilitation practises. Several weeds and invasive species occur on site, as discussed in section 3.3.4 of the ecological report with Prosopis being	Low-Medium	Possible, frequently	Residual	Low Local	• Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible. • Mechanical methods of control should be implemented pro-actively as soon as invasive species start to emerge. • Regular follow-up monitoring of invasive control areas needs to be implemented to ensure effective eradication. • Encourage proper rehabilitation of disturbed areas through soil restoration and

	particularly abundant. Any anthropogenic disturbances to natural vegetation, especially the clearance of large areas of land, provide the opportunity for invasive plants to increase. This is due to their opportunistic nature of dispersal and establishing in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site, because they spread easily to neighbouring habitats where they outcompete indigenous species. These alien invasive					reseeding of indigenous plant species.

	species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity as well as reduction in the ecological value and land use potential 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.					
	Encouragement of bush encroachment During clearing of an area for the excavation of	Low	Possible infrequently	Residual	Low On-site	• Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands.

	minerals, construction of infrastructure and roads, stockpiling, improper rehabilitation practises. The extent of bush encroaching species on site is high, especially regarding the densities of Senegalia mellifera and Rhigozum trichotomum. Bush encroachment is a natural phenomenon characterised by the excessive expansion of certain indigenous shrub species at the expense of other indigenous plant species. Any surface disturbances where the grassland matrix is removed can lead to the expansion of					• Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication. • Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

	encroaching shrubs and trees. When the areas surrounding the shrubs area cleared, it causes an open niche for these competitive species to establish and outcompete the surrounding plants, eventually forming dense and impenetrable stands. This lowers the potential for future land use and decreases biodiversity. With proper mitigation, the impacts can be substantially reduced. In fact, the proposed prospecting activities could reduce the extent of these shrubs significantly. By clearing large stands of shrubs and subsequently					

	effectively rehabilitating the cleared areas, it can benefit biodiversity.					
Fauna	**Loss, damage, and fragmentation of natural habitats** During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling. Fragmentation of habitats typically leads to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This can be in the form of small-scale fragmentation for reptiles, amphibians, and invertebrates, to more large-scale	Medium – High	Certain for life of operation	Residual	Low Medium Regional	• All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type. • The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so. • Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees,

	fragmentation that hinder dispersal of birds and plants. It also includes the degradation of aquatic habitats, like the ephemeral wetlands, which has regional connectivity and form important links in the food-chain on a landscape level. Fragmentation of habitats usually results in a subsequent loss of genetic variability between meta-populations occurring within the region. Pockets of fragmented natural habitats hinder the growth and development of populations. The prospecting activities on Brakfontein are expected to result in the loss of					machinery or even visitors. • No new roads should be created across a wetland. • No prospecting should take place in the wetlands. • If wetland disturbances are unavoidable, a water use license to alter the beds and banks of each affected wetland should be obtained from DWS prior to such activities. • Employ sound rehabilitation measures to restore characteristics of all affected terrestrial and aquatic habitats.

	connectivity and fragmentation of natural terrestrial habitats on a local and landscape scale, especially in terms of terrestrial habitats.					
	Disturbance, displacement and killing of fauna Vegetation clearing; increase in noise and vibration; human and vehicular movement on site resulting from prospecting activities. The transformation of natural habitats will result in the loss of micro-habitats, affecting individual species and ecological processes. This will result in the displacement of faunal species that	Low-Medium	Certain, for life of operation	Decommissioning	Low Local	• Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint. • The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised. Areas surrounding the earmarked site that are not part of the demarcated area should be considered as a no-go zone. • No prospecting should take place in the ephemeral wetlands. If this is unavoidable, a water use license to alter

	depend on such habitats, e.g. birds that nest in trees or animals residing in holes in the ground or among rocks. It also includes the egg banks of specialised branchiopod crustaceans which is found in the sediment of the depressional wetlands. Furthermore, increased noise and vibration will disturb and possibly displace wildlife. Fast moving vehicles cause road kills of small mammals, birds, reptiles, amphibians, and a large number of invertebrates. Intentional killing of snakes, reptiles, vultures and owls due to superstition or fear can negatively affect					the beds and banks of each affected wetland should be obtained from DWS prior to such activities. • If any of the ephemeral wetlands will be excavated, it is vital that the top 5cm of the sediment, which contains the egg banks, be removed prior to such activities, and stored in a suitable location where it cannot be eroded by wind or rain or be compacted or crushed. These egg banks should then ideally be used to restore wetland characteristics if possible, during the rehabilitation phase. However, if this is not possible, the egg banks should be donated to the Albany Museum in Grahamstown, where the freshwater collection of South Africa is housed. • If any of the protected wildlife species are directly threatened by

	their local populations.					habitat destruction or displacement during the prospecting operation, then the relevant permits from DENC should be obtained followed by the relevant mitigation procedures stipulated in the permits. • Everyone on site must undergo environmental induction for awareness on not capturing or harming species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site. • Reptiles, amphibians, mammals, special invertebrates, or active bird nests exposed during the clearing operations should be captured for later release or translocation by a qualified expert. • Employ measures that ensure adherence to a speed limit of 40 km/h as

						well as driving mindfully to lower the risk of animals being killed on the roads or elsewhere in the prospecting area.
Broadscale Ecological processes	Clearing of vegetation and disturbance during the construction of roads and prospecting activities; alterations to watercourse habitat characteristics. Transformation of intact habitat on a cumulative basis would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations. The habitats on site are	Medium-High	Certain for life of operation	Residual	Low-Medium Regional	• Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible. • Apply for the relevant permits from DENC and DAFF relating to terrestrial flora and fauna. • No new roads should be created across a wetland and no prospecting should take place in them. • If this is unavoidable, a water use license should be obtained from DWS prior to such activities. • Employ sound rehabilitation measures to restore characteristics of all affected habitats. • For restoration of the affected terrestrial areas

	vulnerable to cumulative disturbances, due to the vast extent of transformation through mining and agriculture in the region. Fragmentation of these habitats through loss of keystone species will destroy connectivity of vital ecological corridors and it will disrupt the food web, which might have cascading effects on a landscape level over the long-term.					without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment. • To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction. • Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings. • The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas. • If any of the ephemeral wetlands will be excavated, it is vital that the top 5cm of the sediment, which contains the egg banks, be removed prior to such activities, and stored in a suitable location where it

						cannot be eroded by wind or rain or be compacted or crushed. These egg banks should then ideally be used to restore wetland characteristics if possible, during the rehabilitation phase. • However, if this is not possible, the egg banks should be donated to the Albany Museum in Grahamstown, where the freshwater collection of South Africa is housed.
Air Quality	Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Low	Certain for life of operation	Decommissioning	Low Local	Effective soil management: identification of the required control efficiencies in order to maintain dust generation within acceptable levels.
SOCIAL SURROUNDINGS						

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Noise Impacts	Clearing of footprint areas, stripping of stockpiling of topsoil	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction activities Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction of internal Roads	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Assembly plant equipment Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction of the Mine Residue dam, soil stockpile and material stockpile. Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Clearing of new open cast prospecting areas,	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the

	stripping and stockpiling of topsoil. Noise increase at the prospecting site.					manufacturer's specifications on acceptable noise levels.
	Diesel generators Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels.
	Additional traffic to and from the mine	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels.
	Maintenance activities at the different sites.	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels.
	Back fill of prospecting footprint area	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels.
	Planting of grass and vegetation at the rehabilitated areas	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Planting of grass and/or

						vegetation should be limited to daytime only.
	Removal of infra-structure	Low	Possible Infrequently	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels.
Visual impacts	Potential visual impact on gravel road	Low Regional	Certain	Construction, Operation and Decommissioning	Low Local Site	The design of the proposed prospecting development will determine the visual impact.
	Potential Visual Impact on the surrounding land users/ residents	Low Regional	Highly Likely	Construction, Operation and Decommissioning	Low Local Site	The design of the proposed prospecting development will determine the visual impact.
	Potential visual impact of the proposed development on the Sense of Place	Low Regional	Highly Likely	Construction, Operational and Decommissioning	Low Local Site	Design of the proposed development can ensure that the development forms part of the area.
	Potential visual impact of the proposed development on the construction phase of the surrounding land users in proximity	Low Regional	Highly Likely	Construction	Low Local Site	Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. • Ensure that rubble, litter and disused construction materials are managed and removed regularly. • Ensure that all infrastructure and the site and general

						surrounds are maintained in a neat and appealing way;
	Potential visual impact of the proposed development on the operational phase of the surrounding land users in proximity.	Low Regional	Highly likely	Operational	Low Local Site	Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way; Rehabilitation of disturbed areas and re-establishment of vegetation;
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low Likelihood	Decommissioning	Low Local	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The Deterioration of sites of cultural and heritage importance.	Low	Low Likelihood	Decommissioning	Low Local	Any heritage and cultural resources (e.g. ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone. Should any further resources be disturbed, exposed, or uncovered during site preparations, these should immediately be reported to

						an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Socio-Economic	**Population Impacts** Employment Opportunities and skills Inequities	Medium Positive	Decommis-sioning	Start-up and Construction	Medium Positive Local	• Training of potential future employees, contract workers and/or community members should focus on prospecting related skills which would furthermore equip trainees/ beneficiaries with the necessary portable skills to find employment at the available employment sectors within the study area. Multi-skilling is thus not necessarily the preferred training and skills development method. • Training courses should be accredited, and certificates obtained should be acceptable by other related industries.
	Safety and Security Risks	Low Negative	Highly Probable	Construction	Low Negative Local	• A Fire/Emergency Management Plan should

						be developed and implemented at the outset of the prospecting operation. • Open fires for cooking and related purposes should not be allowed on site. • Appropriate firefighting equipment should be on site and workers should be appropriately trained for firefighting. • The prospecting area should be fenced or access to the area should be controlled to avoid animals or people entering the area without authorisation. • The prospecting site should be clearly marked and "danger" and "no entry" signs should be erected. • Speed limits on the local roads surrounding the prospecting sites should be enforced. • Speeding of prospecting vehicles must be strictly monitored.

						• Local procurement and job creation should receive preference.
	Health Impacts	Low Negative	Highly probable	Construction	Low Negative Local	• Maximise the employment of locals where possible. • First aid supplies should be available at various points at the prospecting site. • The general health of prospecting workers should be monitored on an on-going basis.
Interested and Affected Parties	Loss of trust and a good standing relationship between the IAP's and the prospecting company.	Low to medium	Possible	Construction, Operational and Decommissioning	Low Local	Ensure continuous and transparent communication with IAP's

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)

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

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

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

The criteria used to assess the Consequence of the impacts are shown in the table 7 below/overleaf. 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 to identify and analyse the various possible impacts.

Table 7. Consequence of impacts is defined as follows.

CONSEQUENCE				
Colour Code	**Consequence rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Low- Medium	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

Consequence 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.

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

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

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

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

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

Table 8. Criteria used to assess the **SIGNIFICANCE** of impacts.

Weight	Severity	Spatial scope (Extent)	Duration
5	Disastrous	Trans boundary effects	Permanent
4	Catastrophic / Major	National / Severe environmental damage	Residual
3	High / Critical / Serious	Regional effect	Decommissioning
2	Medium / slightly harmful	Immediate surroundings / local / outside mine fence	Life of Operation
1	Minimal/potentially harmful	Slight permit deviation / on-site	Short term / construction (6 months – 1 year)
0	Insignificant/ non harmful	Activity specific / No effect / Controlled	Immediate (0 – 6 months)

Table 9. Explanation of **PROBABILITY** of impact occurrence

Weight number		1	2	3	4	5
Frequency						
Probability	Frequency of impact	Highly unlikely	Rare	Low likelihood	Probable / Possible	Certain
		Practically impossible	Conceivable but very unlikely	Only remotely possible	Unusual but possible	Definite
	Frequency of activity	Annually or less	6 months/ temporarily	Infrequent	Frequently	Life of Operation

Table 10. Explanation of **SEVERITY** of the impact

Weight	Impact Severity	Explanation of Severity
0	Insignificant/ non harmful	There will be no impact at all – not even a very low impact on the system or any of its parts.
1	Minimal/potentially harmful	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.
2	Medium / slightly harmful	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.
3	High / Critical / Serious	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.
4	Catastrophic / Major	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.
5	Disastrous	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

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

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

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and Mine residue dam 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 declared 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 unusable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for 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 lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present 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 plant establishes 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 mineral resource through proper planning.
- The prospecting should be well planned, 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 mine manager.

Topography

Level of risk: Low

Mitigation measures

- prospecting continuously, if possible, otherwise when they become available;
- Employ effective rehabilitation strategies to restore surface topography of and controlled dumping and plant site;
- Stabilise the mine residue deposits;
- All temporary infrastructures should be demolished during closure.

Soil erosion

Level of risk: Low- Medium

Mitigation measures

- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in each area have ceased.
- Bare ground exposure should be minimised in terms of the surface area and duration.
- The operation must co-ordinate different activities in order to optimise the excavated pits and trenches and thereby prevent repeated and unnecessary excavations and disturbances to the vegetation and soil.
- Construction/excavations during the rainy season (November to March) should be monitored and controlled.
- Run-off from exposed ground should be controlled with flow retarding barriers.
- 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 on the higher lying areas of the footprint area and not in any natural storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Regular audits carried out to identify areas where erosion is occurring (incl. linear activities such as roads and pipelines); followed by appropriate remedial actions.

Loss of Soil fertility

Level of risk: Medium - High

Mitigation measures

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.

Alteration of Soil character and quality

Level of risk: Medium-High

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.
- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure, and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.

- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.
- Vehicles and machinery should be regularly serviced and maintained.
- Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all stationary vehicles.
- Spill kits to clean up accidental spills must be well-marked and available on site.
- Workers must undergo induction to ensure they are prepared for rapid clean-up procedures.
- Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.

Land capability and land use

Level of risk: Low to Medium

Mitigation measures

- Employ appropriate rehabilitation strategies to restore land capability.
- Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.

Ground water

Level of risk: Low

Mitigation measures

- Training and awareness
  - Make all employees aware of water conservation/water demand management, water pollution avoidance and minimization measures reporting procedure and registry of incidents.
  - Train all employees to reduce water consumption.
  - Make one (1) individual person at a management level responsible for the management of the overall mine water balance. Train departmental heads in the managing of water balance, water pollution and water conservation within their sectors.
  - Train all employees in the implementation of standard operating procedures (SOP's) (e.g. hydrocarbon management, sewerage management, monitoring and record keeping).
  - Minimise and manage the loss in water resource
  - Allow for a safe working environment.

Surface water

Alteration/destruction of watercourses

Level of risk: Medium -High

Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- 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.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The prospecting site should be cleaned daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which can contribute to surface water pollution.
- Only environmentally friendly materials must be used to minimize pollution of surface water runoff and/or underground water resources.
- Pipe leakages should be minimized.
- Proper clean and dirty water separation techniques must be used to ensure uncontaminated water returning to the environment.
- Non prospecting waste i.e. grease, lubricants, paints, flammable liquids, garbage, historical machinery and other combustible materials generated during activities should be placed and stored in a controlled manner in a proper designed area.
- The topography of rehabilitation disturbed areas must be rehabilitated in such a manner that the rehabilitated area blends in naturally with the surrounding natural area. This will reduce soil erosion and improve natural re-vegetation.

Surface water

Siltation of surface water

Level of risk: Low - Medium

Mitigation measures

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- No new roads, infrastructure or prospecting areas should be developed over watercourses.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.

- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Loss of Indigenous flora
Level of risk: Low to medium
Mitigation measures

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Implement effective avoidance measures to limit any activities in the highly sensitive areas, by applying the no-go principles.
- Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on plants in the adjacent pristine areas.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas.
- Apply for permits to authorise the clearance of indigenous plants from DENC at least three months before such activities will commence.

Loss of Red data and / or protected floral species
Level of risk: Medium-High
Mitigation measures

- The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation.
- It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated (if possible). The relevant permits from DENC should be applied for at least three months before such activities will commence.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of all the rescued plants.
- 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 to ensure successful translocation.
- The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and 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.
- All those working on site must be educated about the conservation importance of the flora occurring on site as well as the legislation relating to protected species.

- Employ regulatory measures to ensure that no illegal harvesting takes place.

Introduction or spread of Alien invasive plants

Level of risk: Low to Medium

Mitigation measures

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

Bush Encroachment

Level of risk: Low

Mitigation measures

- Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands.
- Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

Fauna

Habitat fragmentation

Level of risk: Medium-High

Mitigation measures

- All activities associated with the prospecting operation must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.
- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors.
- Employ sound rehabilitation measures to restore the characteristics of any affected habitats. 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 extent of the proposed prospecting should be demarcated on site layout plans.
- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must

ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.

- All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring 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.

Disturbance displacement and killing of fauna

Level of risk: Low-Medium

Mitigation measures

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

Broadscale Ecological processes

Compromise of broadscale ecological processes

Level of risk: Medium -High

Mitigation measures

Implement best practise principles to minimise the footprint of transformation.

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Apply for the relevant permits from DENC and DAFF.
- No new roads should be created across a watercourse and no prospecting should take place in them. If this is unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected habitats.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.

- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas.

Air quality

Level of risk: Low-Medium

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting 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 open areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed.
- Dust suppression methods should, where logistically possible, must 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:
    - Speed limits;
    - Spraying of surfaces with water;
    - Prospecting and rehabilitation of disturbed areas; and

Noise and vibration

Level of risk: Low to Medium

Mitigation measures

- Machinery with low noise levels which complies with the manufacturer's specifications to be used.
- Noise monitoring on a quarterly basis.
- Vehicles to comply with manufacturers' specifications and any activity which will exceed 90.0dBA to be done during daytime only.
- Haul roads to be levelled on a regular basis to avoid the formation of potholes.

Visual impacts

Level of risk: Low to Medium

Mitigation measures

Mitigation measures may be considered in two categories:

- Primary measures that will be implemented should mainly be measures that minimise the visual impact by softening the visibility of the prospecting activities, by "blending" with the surrounding areas. Such measures will include rehabilitation of the disturbed area, such as the prospecting areas by re-vegetation of the area and using an aesthetically pleasing design for the proposed development.
- During the prospecting phases the following mitigation measures should be implemented to minimise the visual impact.
- Restrict the activities and movement of workers and vehicles to the immediate site and existing access roads.
- Ensure that rubble, litter and disused materials are managed and removed regularly.
- Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way.
- Reduce and control dust emitting activities through the use of approved dust suppression techniques; and
- Restrict activities to daylight hours in order to negate or reduce the visual impacts associated with lighting or restrict lighting to certain areas.
- During operational phase, the following mitigation measures should be implemented to minimise the visual impact.
- Ensure that the design fits into the surrounding environment and it is aesthetically pleasing.
- Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way;
- Rehabilitation of disturbed areas and re-establishment of vegetation;

Traffic and road safety

Level of risk: Low

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage resources

Level of risk: Low

Mitigation measures

- The heritage and cultural resources (e.g. ruins, graves, historic structures, etc.) must be protected and preserved by the delineation of a no go zone.
- Should any further heritage or cultural resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist.

Chance Find Protocol

1. Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.
2. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.

3. 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, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
4. 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.
5. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
6. 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.
7. 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.
8. If no good fossil material is recovered, then no site inspections by the palaeontologist will not 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.
9. If no fossils are found and the excavations have finished, then no further monitoring is required.

Socio-economic

Level of risk: Low-Medium

Mitigation measures

In order to ensure that negative impacts are minimised, and positives are enhanced, the following is recommended:

- As job creation is one of the most pressing socio-economic needs in the local community, through the development of the Brakfontein operation should focus on related local job creation, whilst considering the limitations of the available local skills.
- The Northern Spark Trading operation should assist their employees to find suitable housing in the towns surrounding the prospecting area.
- Assistance in terms of skills development for those that would be employed during the project, as well as for permanent employees during the operational phase of the project would be necessary. Education is critical to sustain the socio-economic development of the community members living in the area. Continued support for training and capacity building thus remains important.

Interested and affected parties

Level of risk: Low

Mitigation measures

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

ix) Motivation where no alternative sites were considered

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

x) Statement motivating the alternative development location within the overall 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 proposed mineable resource.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity (Including (i) a description of all environmental issues and risks that are identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures)

Not applicable. There is no alternative development location for the site and therefore the initial site locality is considered to be the final site locality. The impact assessment provided in section g(v) is therefore sufficient and the process undertaken to identify impacts is the same as in section g(vi).

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, Decommissioning, closure, post closure)	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	SIGNIFICANCE IF MITIGATION
Processing Plant: 2 X 16 feet pans	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air Quality Fauna Flora Noise Soil Surface water Safety	Construction Commissioning Operational Decommissioning Closure	Medium	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Medium
Ablution Facilities	Soil contamination	Soil Groundwater Odours	Construction Commissioning Operational	Low	Maintenance of sewage facilities on a regular basis.	Very Low

Chemical Toilets	Possible Groundwater contamination		Decommissioning Closure		Removal of chemical toilets on closure	
Clean & Dirty water systems:	Surface disturbance Soil contamination Surface water contamination	Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Low-Medium	It will be necessary to divert storm water around dumps areas by a berm that will prevent surface run-off into the drainage areas. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads and pipes will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion. The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle	Low

					sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre-and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation.	
Fuel Storage facilities (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. 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.	Low

Prospecting Area.	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	Medium	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays MRD stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre-and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation.	Low

					The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring 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. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed;	
Salvage yard (Storage and laydown area)	Possible Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Low

	Surface water contamination					
Stockpile area	Dust Possible Groundwater contamination Surface water contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Medium	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Low
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Low
Roads (both access and haulage road on	Dust Groundwater contamination	Air quality Fauna Flora Groundwater	Construction Commissioning Operational Decommissioning	Medium	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits	Low

the prospecting site):	Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Noise and vibration Soil Surface water	Closure		Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. 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.	
Temporary Workshop Facilities and Wash bays	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Low

Water distribution Pipelines	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Monitor pipeline for water leaks Maintenance of pipeline 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.	Low
Water tanks: 1 X 10 000 litre water tanks and purifiers for potable water for each site.	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintain water tanks and structures	Low

j) Summary of specialist reports

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
ECOLOGICAL ASSESSMENT REPORT **Northern Spark 428 (Pty) Ltd Remaining Extent of the Farm Brakfontein 276** **Districts of Hopetown** **Northern Cape Province** **Ecological & Wetland Assessment Report in application for Environmental Authorisation related to a Diamond Prospecting Right** **June 2023** **APPENDIX 4**	**CONCLUSION, RECOMMENDATIONS AND OPINION REGARDING AUTHORISATION** Three plant communities occur on site, including terrestrial and aquatic habitats. The two depressional wetlands are both considered to be of very high sensitivity due to their vital ecological and hydrological functionality and significance, which is portrayed in the various sections of this report. The calcrete terraces are of high sensitivity, primarily because of the high number of the nationally protected tree (Boscia albitrunca) that occur here and the suitable habitat and overlapping distribution range for protected birds. The grassland is of medium sensitivity. The most profound impacts are expected to be related to the cumulative loss of natural terrestrial habitat on a landscape scale as well as the removal of the nationally protected tree, Boscia albitrunca. A number of provincially protected species also occur on site. Before any of these species are damaged or removed, permits need to be obtained from the Northern Cape Department of Environment and Nature Conservation and/or Department of Agriculture, Forestry and Fisheries, at least three months prior to any clearance of affected species. The wetland in the west is in a near-natural condition, with high ecological importance and sensitivity, while the wetland in the east has been moderately modified. The most profound functional importance of the wetlands relates to the maintenance of biodiversity in the form of unique habitats they provide for freshwater crustaceans. Even though rarely wet, these wetlands harbour egg banks of these specialised freshwater invertebrates in the dry sediment, which allows for the continuation of the species once the wetlands flood. Protecting the sediment in-situ is therefore vital. It is not currently known if the wetlands are within the core areas earmarked for prospecting, but before any direct	X	Contained in the mitigation measures and EMPR

	activities can take place within a wetland, a water use licence needs to be obtained for Department of Water and Sanitation prior to such activities. To conclude, disturbances to ecological communities and the destruction of natural habitats are inevitable during prospecting operations. The significance of related impacts however depends on the mitigation and rehabilitation measures implemented by the prospecting company. In my opinion, authorisation for the proposed prospecting operation can be granted if the applicant commits to strictly adhere to effective avoidance, management, mitigation, and rehabilitation measures.		
Heritage Impact Assessment (including Palaeontological Desktop Assessment) for a Prospecting Right Application on the Remaining Extent of the Farm Brakfontein 276 near Prieska in the Siyathemba Local Municipality, Northern Cape Province Local Municipality, Northern Cape **Prepared by** **Edward Matenga** **(PhD Archaeology & Heritage, MPhil, Archaeology; Uppsala/Sweden)** **5 July 2023** **APPENDIX 5**	**Conclusion and recommendations** **There is no compelling reason to destroy the two stone enclosures that are likely to be treasured in the future as footprint of the development of commercial farming in the karoo. Other that the stone walls, the sites recorded warrant no further action. The prospecting right application can therefore be approved subject to precautions taken about the stone walls. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds undertaken.**	X	
Palaeontological Impact Assessment for the proposed Prospecting Right Application on the Remaining Extent of the Farm Brakfontein 276, near Prieska, Northern Cape Province	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 dolomites, sandstones, shales and sands are typical for the country and only some might contain trace fossils, fossil plant, insect, invertebrate and vertebrate material. The sands of the Quaternary period would not preserve fossils. The site visit verification confirmed that were NO FOSSILS of any kind visible on the land surface. It is not known what lies below the ground surface.	X	

Desktop Study (Phase 1) **For** **Archaeological and Heritage Services Africa (Pty) Ltd** **6 July 2023** **Prof Marion Bamford** **Palaeobotanist** **APPENDIX 6**	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 Dwyka Group tillites and sandstones or the sands and calcretes of the Tertiary-Quaternary. There is a very small chance that fossils may occur in features such as palaeo-pans or palaeo-dunes that could trap fossils are present as no such feature is visible in the satellite imagery. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the miners or environmental officer, or other responsible person once mining has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be low, therefore, as far as the palaeontology is concerned, the project should be authorised and a prospecting permit granted.		

Attach copies of the Specialist Reports as appendices (All studies attached as Appendices from 4 - 6)

k) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

- The Processing plant may have a medium impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Ablution facilities will have a very low impact on groundwater and soil in case of an emergency spill after mitigation.
- The Clean & Dirty water systems may have a medium impact on groundwater, soil and surface water after mitigation.
- The Fuel Storage facilities (Diesel tanks) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Prospecting Area may have a medium impact on air quality fauna, flora, noise, soil, surface water and topography after mitigation.
- The Salvage yard (Storage and laydown area) may have a low impact on fauna, flora, groundwater, soil and surface water after mitigation.
- The Stockpile area may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The waste disposal sites (domestic and industrial waste) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Roads (both access and haulage road on the prospecting site) may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Workshops and Wash bays may have a low impact on groundwater, soil and surface water after mitigation.
- The Water distribution Pipelines may have a low impact on fauna, flora, and surface water after mitigation.
- The Water tanks may have a low impact on fauna, flora, and surface water after mitigation.

From the assessment of impacts throughout all the phases it is clear that though the impacts may occur directly as a result of the proposed start in prospecting operations, the impacts are mostly of medium significance before mitigation. According to the assessment carried out by the EAP the majority of the impacts can be reduced to a low significance with the appropriate mitigation measures in place.

The EAPs and environmental consultants responsible for the compilation of this document, and the associated PPP are of the opinion based on the presented specialist assessments and impact assessment that the Environmental Authorization application should be authorised. In terms of the ecological study Dr. Milne said in her opinion, authorisation for the proposed operation should not be granted unless the applicant commits to strictly adhere to effective avoidance, management, mitigation and rehabilitation measures.

The following mitigation measures are crucial and should form part of the environmental authorisation to ensure that the applicant manages impacts adequately:

- Adhere to the approved Environmental Management Programme
- Adhere to the Emergency procedures Report and implement spill clean-up procedures!
- Apply for relevant permits with authorities for the removal of indigenous tree species and indigenous vegetation if applicable.
- Major spills should be reported within 24hr to the Department of Water and Sanitation and the NCDENC.

The nature of impacts can vary widely depending on the type of physical environment, the size of the activity and the perceptions and values of each of the affected parties. It was the objective of the assessment to identify both positive and negative impacts. The existing information was reviewed to assess the present status of the environment and the extent to which they have already been modified. The planned activities and associated infrastructure were used as reference to assess potential impacts.

In general, the environmental impacts associated to the prospecting operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound because the prospecting operation will constitute clearance of indigenous vegetation and most likely also the removal of protected species if any is encountered. Soil erosion and surface water deterioration are likely to be possible important impacts if appropriate management strategies are not practised.

Positive impacts include the demarcation and subsequent protection of heritage resources and the eradication of alien invasive species. Positive social impacts include the creation of jobs, social upliftment, training opportunities, community development and numerous economic benefits.

To conclude, it must be accepted that any activities will have both physical and social impacts. Therefore, the destruction of the natural environmental features within the prospecting area is inevitable. The significance of the impacts will however be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area.

(ii) Final Site Map;

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicated any areas that should be avoided, including buffers. Attach as **Appendix (Figure 26)**

The final site map below indicates the prospecting application area in which all prospecting will take place. Existing roads are also depicted.

The sensitivity map for the prospecting operation is illustrated in Figure 28. All watercourses in the study area are also unique habitats protected in terms of the National Water Act (Act No 36 of 1998). These units are essentially **no-go areas**.

The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre-and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation.

The only other buffers that must be implemented is the 100m away from any fixed infrastructure like the roads that runs on the farm in terms of the Mine Health and Safety Act, 1996 (Act no 29 of 1996) Regulations relating to surveying, mapping and mine plans. These regulations states that a prospecting operation must take reasonable measures to ensure that-

No prospecting operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams or any other structure whatsoever including such structures beyond the prospecting boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with;

In terms of the ecological study the most profound impacts expected to be related to the proposed prospecting operation include cumulative loss of intact habitat and biodiversity on a landscape level, as well as potential loss in soil fertility and loss of Boscia albitrunca recruits. Saplings are rarely visible during clearance operations and therefore the younger populations often get wiped out completely. Permit applications need to be lodged with the Northern Cape Department of Environment and Nature Conservation three months prior to any removal of protected species. Similarly, a licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries three months prior to any potential disturbances to the Boscia albitrunca trees. If any of the watercourses will be impacted, then a general authorisation or water use license should be obtained from Department of Water and Sanitation, prior to such activities.

The destruction of the natural plant species and habitats is inevitable due to the nature of the proposed prospecting operation, but the significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the operation. In my opinion, authorisation for the proposed operation can be granted. However, the applicant should commit to the strict adherence of effective avoidance, management, mitigation, and rehabilitation measures.

Please see Final Site Map below.

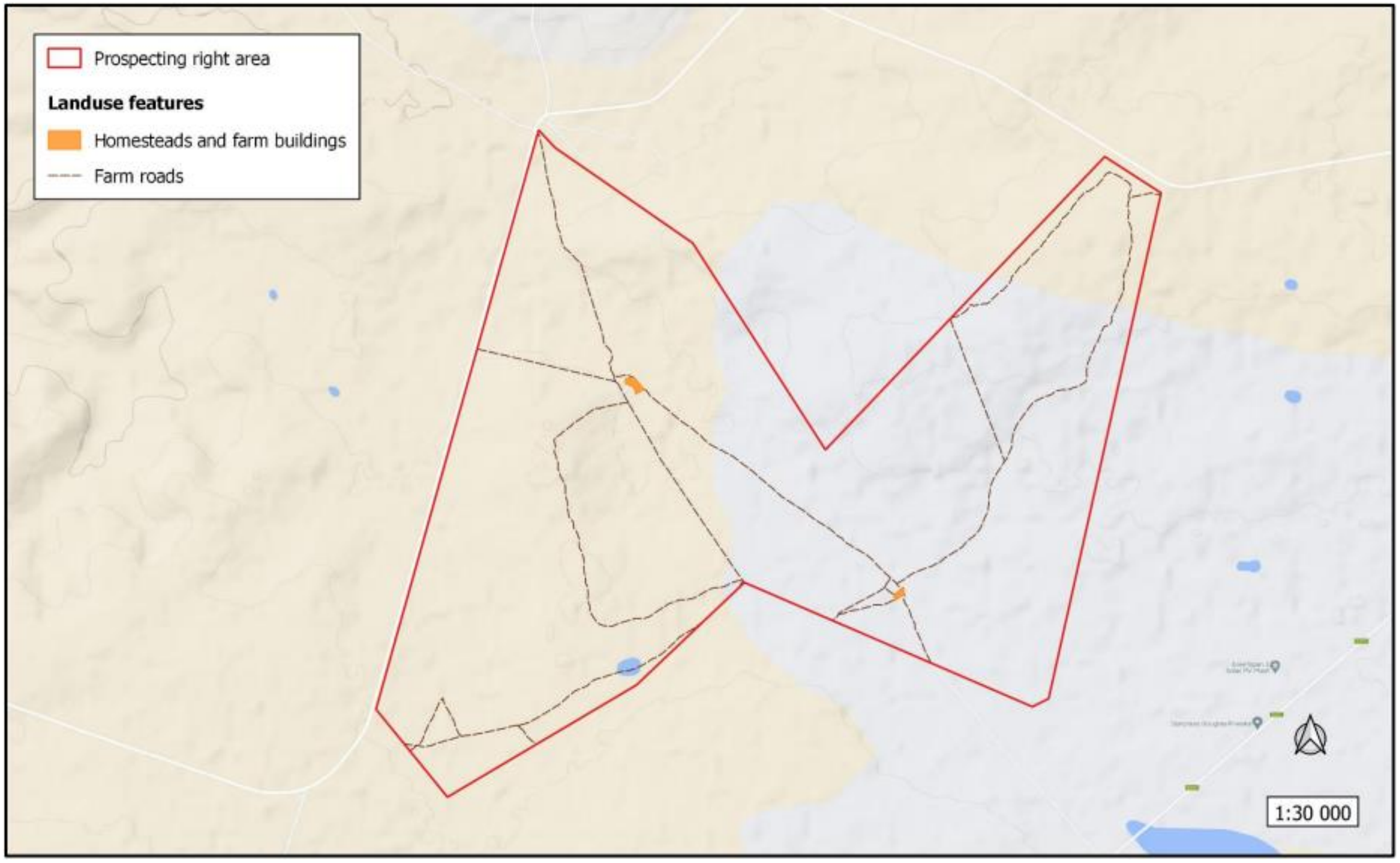


Figure 29. Existing infrastructure map (Dr. B Milne, Ecological report).

(iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives.

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 and Mine residue dam 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 declared areas will be rehabilitated, but full restoration of soil might only occur over some time, after 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 unusable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances, and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for 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 lots of dust which can reduce the growth success and seed dispersal of many small plant species. It

is expected that protected species if present 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 plant establishes 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.

The prospecting activities and associated infrastructure by itself will thus not introduce new social risks and hazards, but only increase the probability and scale of those already associated with the existing prospecting activities.
On a more detailed level, the following **positive** impacts are anticipated:

- The creation of job opportunities in the area, and associated local economic development;
- Economic and revenue contribution to the local municipal area, as well as the District and adjacent municipalities;
- The positive impact of prospecting activity on the regional and local economy; and
- Positive impact of extensive local procurement focus.

Negative impacts as a result of the prospecting activity refer to:

- Inconvenience and intrusion impacts during the project such as the inflow of an additional workforce to the area, the possible influx of jobseekers, possible increase in the criminal activities (safety and security issues), disruption of social networks, as well as possible health risks;
- Disruptions in the daily living and movement patterns (increased traffic and possible dust pollution);
- Additional pressure on infrastructure development and maintenance;
- General intrusion impacts such as visual and noise pollution

From a social perspective it can be concluded that the proposed Brakfontein Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the prospecting activity outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view if mitigation measures are implemented.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR are adhered to e.g. ongoing environmental management and rehabilitation once the mine reaches its end of life.

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as conditions of authorisation.

Topography

- All prospecting areas must be rehabilitated when possible and made safe so as to reflect as far as possible the pre-prospecting topography of the area.
- All temporary features e.g. plant, containers and stockpiling must be removed and handled in the prescribed manner during rehabilitation.

Soil

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure, and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the
- formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.

- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.
- Vehicles and machinery should be regularly serviced and maintained.
- Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all stationary vehicles.
- Spill kits to clean up accidental spills must be well-marked and available on site.
- Workers must undergo induction to ensure they are prepared for rapid clean-up procedures.
- Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.
- Topsoil needs to be removed and stored separately during prospecting and the construction
- of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.
- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- No new roads, infrastructure or prospecting areas should be developed over watercourses, including drainage lines.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Flora

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.

- Implement effective avoidance measures to limit any activities in the highly sensitive areas, by applying the no-go principles.
- Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on plants in the adjacent pristine areas.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas.
- Apply for permits to authorise the clearance of indigenous plants from DENC at least three months before such activities will commence.
- The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation.
- It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated (if possible). The relevant permits from DENC should be applied for at least three months before such activities will commence.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of all the rescued plants.
- 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 to ensure successful translocation.
- The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and 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.
- All those working on site must be educated about the conservation importance of the flora occurring on site as well as the legislation relating to protected species.
- Employ regulatory measures to ensure that no illegal harvesting takes place.

Introduction or spread of alien species:

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Mechanical methods of control should be implemented pro-actively as soon as invasive species start to emerge.
- Regular follow-up monitoring of invasive control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

Encouraging bush encroachment:

- Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands.
- Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

Fauna

Habitat fragmentation

- All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.
- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors.
- No new roads should be created across a watercourse.
- No prospecting should take place in the ephemeral pan, drainage lines or river.
- If watercourse disturbances are unavoidable, a water use license to alter the beds and banks of these watercourses should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected terrestrial and aquatic habitats.

Disturbance, displacement and killing of fauna

- Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint.
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised. Areas surrounding the earmarked site, not part of the demarcated area, should be considered as a no-go zone.
- No prospecting should take place in the pan, drainage lines or river and no new roads should be created across these watercourses. If unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the prospecting operation, then the relevant permits from DENC should be obtained followed by the relevant mitigation procedures stipulated in the permits.
- Everyone on site must undergo environmental induction for awareness on not capturing or harming species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site.

- Reptiles, amphibians, mammals, special invertebrates or active bird nests exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to a speed limit of 40 km/h as well as driving mindfully to lower risks of animals being killed on the roads or elsewhere on site.

Surface water

Alteration/destruction of watercourses

- All activities associated with the prospecting operation must be planned to avoid any disturbances to the watercourses and their buffer zones.
- No new roads should be created across a watercourse and no prospecting should take place in them. If this is unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected watercourses.

Siltation of surface water

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- No new roads, infrastructure or prospecting areas should be developed over watercourses.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Groundwater

- Vehicle- and equipment maintenance must only be allowed within the maintenance area. Only emergency breakdowns may be allowed in other areas.
- The following procedure must be followed if a vehicle or piece of equipment would break down inside an excavation and outside of the maintenance area.
    - Drip pans must be placed at all points where diesel, oil or hydraulic fluid may drip and in so doing contaminate the soil.
    - All efforts must be made to move the broken-down vehicle or piece of equipment to the maintenance area.
    - If the vehicle/piece of equipment cannot be moved, the broken part must firstly be drained of all fluid. The part must then be removed and taken to the maintenance area.
- No repairs may be allowed outside the maintenance area except for emergencies.
- Equipment used as part of the proposed operation must be adequately maintained so as to ensure that the oil, diesel, grease or hydraulic fluid does not leak during the operation.

- Fuel and other petrochemicals must be stored in steel receptacles that comply with SANS 10089-1:2003 (SABS 089-1:2003) standards. An adequate bund wall, 150% of volume of the largest storage receptacle, must be provided for fuel and diesel areas to accommodate any spillage or overflow of these substances. The area inside the bund wall must be lined with an impervious lining to prevent infiltration of the fuel into the soil (and ultimately groundwater).
- Proper sanitation facilities must be provided for employees.
- Acceptable hygienic and aesthetic practices must be adhered to.
- The workshops, washing bays and sewage tanks should be constructed far away from significant aquifer systems.
- SOP for storage, handling and transport of different hazardous materials.
- Place oil traps (drip trays) under stationary vehicles, only re-fuel al fuelling stations, construct structures to trap fuel spills at fuelling stations, immediately clean oil and fuel spills and dispose of contaminated material at licensed sites only.
  Ensure good housekeeping rules.

Air Quality

- To limit the creation of nuisance dust the following management guidelines must be followed:
- Avoidance of unnecessary removal of vegetation.
- Routine spraying of unpaved site areas and roads utilized by the prospecting operation with water.
- Speed limits of vehicles inside the prospecting area must be strictly controlled to avoid excessive dust or the excessive deterioration of the roads to be used.
- Continuous dumping and rehabilitation of disturbed areas.
- All cleared, disturbed or exposed areas must be re-vegetated as soon as practically possible to prevent the formation of additional sources of dust.

Noise

- Working hours must be kept between sunrise and sunset as far as possible.
- As a minimum, ambient noise levels emanating from the prospecting activities may not exceed 82dBA at the site boundary.
- The Company must comply with the Occupational Noise Regulations of the Occupational Health and Safety Act, Act 85 of 1993.
- The company must comply with the measures for good practice with regard to management of noise related impacts during the operation.
- The management objective must be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant area and that which may migrate outside the plant area.
- When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where

persons may travel or works exceeds 82 dB (A), the site manager will take the necessary steps to reduce the noise below this level.

- Hearing protection must be provided to all employees where attenuation cannot be implemented.
- If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.

Mechanical equipment

- All mechanical equipment must be in good working order and vehicles must adhere to the relevant noise requirements of the Road Traffic Act.
- All vehicles in operation must be equipped with a silencer on its exhaust system.
- Safety measures, which generate noise such as reverse gear alarms on large vehicles, must be appropriately calibrated / adjusted.

Safety

- No employees may reside on the prospecting site.
- Access and haul roads must be maintained.
- Security access point to ensure monitoring of access to the site.

Archaeology:

- All operators of equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered:
    - All activity in the immediate vicinity (50m radius of the site) should cease.
    - The heritage practitioner should be informed as soon as possible.
    - In the event of obvious human remains the SAPS should be notified.
    - Mitigation measures (such as refilling) should not be attempted.
    - The area in a 50m radius of the find should be cordoned off with hazard tape.
    - Public access should be limited.
    - No media statement should be released until such time as the heritage practitioner has had sufficient time to analyse the finds.

Chance Find Protocol

- Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.
- The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
- 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, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- 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.

- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- 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.
- 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.
- If no good fossil material is recovered then no site inspections by the palaeontologist will not 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.
- If no fossils are found and the excavations have finished, then no further monitoring is required.

Visual

- Security Lights must be fixed at an angle to ensure that it does not cause a disturbance to the surrounding environment at night
- Prospecting Areas must be subject to progressive controlled backfilling and made safe (including the re-establishment of vegetation).
- Permanent structures or features that are part of the proposed prospecting operation must be kept neat and well presented.
- Waste material of any description must be removed from the prospecting area on a regular basis and be disposed of at a recognized landfill facility.

The **impact management objectives** for the Brakfontein planned prospecting operation should include:

- To ensure efficient extraction of the diamonds and to prevent the sterilization of any diamond reserves.
- To limit the alteration of the surrounding topography
- To manage and preserve soil types.
- To prevent the loss of land capability
- To ensure the continuation of economically viable land use.
- To ensure that the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of ground water resources.
- The non-perennial stream is classified as a water system according to GN704 and is a natural storm water accumulation stream. No water system shall be mined before an authorization is obtained from DWS.

- Rehabilitation of disturbed areas during the prospecting life cycle as well as during closure phase has to be done to minimize erosion and/or pollution of natural streams.
- To contain soils and materials within demarcated areas and prevent contamination of storm water runoff.
- To minimise the loss of natural vegetation.
- To prevent the proliferation of alien invasive plants species.
- To protect the wildlife and bird species.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.
- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive infrastructure, activities, and facilities.
- To ensure that all traffic generated by the proposed prospecting development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve the historical and cultural artefacts located on site in compliance with the South African Heritage Resources Act, 1999 (Act No 25 of 1999).
- To ensure that the current socio-economic status quo is improved.
- To be transparent and practise effective communication; to maintain good relationships with all interested and affected parties.

m) Final proposed alternatives

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

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.

n) Aspects for inclusion as conditions of Authorisation

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives

and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

o) Description of any assumptions, uncertainties, and gaps in knowledge

(Which relate to the assessment and mitigation measure proposed)

The above mitigation measures are tried and tested over many years in the diamond prospecting industry. The Company must monitor the potential impacts throughout the life of operation, and mitigate any deviations detected. This has been proven to be very effective in existing operations.

Assumptions and limitations in the ECOLOGICAL ASSESSMENT REPORT

The study took place during early summer, which is not an optimal time of the year. The area received good rainfall during the previous season, but most grasses and annuals were still dormant during the time of the field survey and therefore the vegetation was not in a favourable state for the assessment. Furthermore, due to the brief duration of the survey and lack of seasonal coverage, the species lists reflected in this report cannot be regarded as fully representative. Ideally, a site should be visited during different seasons to ensure the variation in species presence and habitat conditions are captured. However, this is rarely possible due to time and cost constraints related to prospecting and mining right application processes. The survey was nevertheless conducted in a manner to ensure all representative communities were traversed, to include most of the common and important species present.

Official guideline documents and tools currently available to assess wetlands in South Africa were mainly developed for- and best applied to temperate wetlands of South Africa. The suite of methodologies available to date do not provide for a comprehensive and accurate assessment of our ephemeral wetlands. This is mainly because they are rarely wet and do not display typically descriptors used for wetland assessments in South Africa. These systems have also received little attention in terms of scientific research. Therefore, the nature of the wetland on site and the lack of fully applicable methodologies limits our ability to justify the impacts to and sensitivity of these systems. Nevertheless, methodologies used for this assessment was adapted from the official guidelines, based on specialist knowledge and experience, to provide a comprehensive understanding of the wetlands and associated impacts related to prospecting. The EAP who compiled this document and the specialists who compiled the respective specialist reports have extensive knowledge in their field and it is therefore assumed that the above assumptions are adequate, and that the information provided is correct.

Assumptions and uncertainties in the palaeontological report

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 dolomites, sandstones, shales and sands are typical for the country and only if there such features as palaeo-pas or palaeo-dunes to trap any fossil plant, insect, invertebrate or vertebrate material would any occur in the area. The sands of the Quaternary period would not preserve fossils.

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

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

There are no significant reasons why the activity should not be authorised. However, if the proposed management and mitigation measures are not properly applied or if the prospecting operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the prospecting operation complies with the conditions set out in the approval of the EMPR.

Dr. Betsie Milne in the Ecological study stated the following: The destruction of the natural plant species and habitats is inevitable due to the nature of the proposed prospecting operation, but the significance of the impacts will ultimately be affected by **the success of the mitigation measures implemented during the operation**. In my opinion, authorisation for the proposed operation can be granted. However, the applicant should commit to the strict adherence of effective avoidance, management, mitigation, and rehabilitation measures.

ii) Conditions that must be included in the authorisation.

(1) Specific conditions to be included into the compilation and approval of EMPr

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

Five habitats were identified on site, of which the aquatic habitats (pans and drainage lines), along with their riparian buffer zones are the most sensitive to prospecting. The terrestrial habitats include shrublands on the hills and irregular plains as well as grassland that have established on sandy pockets between the plains and drainage lines. The shrublands host a widespread occurrence of Boscia albitrunca and is considered to be of high sensitivity, while the substrate of the grassland on sand poses high runoff and sedimentation risks to the adjacent watercourses, which further increases its sensitivity. (taken out of the ecological study by Dr. Betsie Milne).

(2) Rehabilitation requirements

A Detailed rehabilitation plan is included in the EMPR as alluvial diamond prospecting consist of continuous stripping and backfilling operations. The Mine had to provide to the DMR, a financial rehabilitation guarantees to the amount as calculated in terms of the financial quantum Guideline and approved by the DMR.

Infrastructure areas

On completion of the prospecting operation, the various surfaces, including the access road, the office area, storage areas and the plant site, will finally be rehabilitated as follows: All other material on the surface will be removed to the original topsoil level where possible. This material will then be backfilled into any open pits. Any compacted area will then be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped.

All infrastructures, equipment, plant, and other items used during the operational period will be removed from the site.

On completion of operations, all buildings, structures or objects on the office site will be dealt with in accordance with regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits:

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the prospecting area and disposed of at a recognized landfill facility. It should not be permitted to be buried or burned on the site.

Ongoing Seepage, Control of Rain Water:

Water Quality Management in accordance with the South African Water Quality Guidelines must be adhered to in order to provide timely and accurate water data to the Department of Water and Sanitation (DWS) as well as to manage impacts caused by the activity. Specific objectives of such a program are to:

- Determine whether water quality comply with water quality standards.
- Provide timely data for intervention as and when required.
- Assess the status of water quality in the surrounding areas.
- Provide analytical water quality information describing trends (present conditions and changes).

The objectives are to limit the adverse effect of pollutants in the water resource. The setting of in-stream Resource Water Quality Objectives (RWQO) is based on the South African Water Quality Guidelines.

Water Monitoring Points

Surface water: The Orange River is about 5km away from the prospecting area at the closest point. The two wetlands and drainage channel should be avoided. If water is abstracted from the Orange River a point above and below the abstraction should be used as Water Monitoring Points.

Long Term Stability and Safety: It should be the objective of mine management to ensure the long-term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary unless vegetation growth is not returned to a desirable state by the time of mine closure.

Final Rehabilitation Roads:

- After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources and Energy.

Submission of Information:

- Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources – Kimberley, as described in Regulation 55 and NEMA (amended).

Maintenance (Aftercare):

- Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme.
- The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.
- The aim with the closure of the mine should be to create an acceptable post-mine environment and land-use. Therefore, all agreed commitments should be implemented by Mine Management.

After-effects Following Closure:

Acid Mine Drainage: No potential for bad quality leachate or acid mine drainage development is associated with diamond mine closure.

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long-term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent monitoring of all material and replacement of topsoil where available should be ensured.

q) Period for which the Environmental Authorisation is required

5 years. With the option to renew for a further 3 years.

r) Undertaking

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

The undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Programme Report.

s) Financial Provision

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

i) Explain how the aforesaid amount was derived

The total cost to rehabilitate and mitigate the Brakfontein site as it stands currently (risking premature rehabilitation) is estimated to be R 828 017 according to the DMR calculations.

ii) Confirm that this amount can be provided from operating expenditure

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining Work Programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be)

It is confirmed that the amount for outstanding rehabilitation can be provided from operating expenditure.

t) Deviations from the approved scoping report and plan of study

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

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation)

Not applicable – No deviations from the methodology proposed in the Scoping Report.

ii) Motivation for the deviation

Not applicable – No deviations from the methodology proposed in the Scoping Report.

u) Other information required by the competent Authority

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

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

From a social perspective the following objectives and measures should be included as part of the Social Management Plan (SMP) as part of the Environmental Management Plan (EMP).

It should be noted that the responsibility of the mitigation lies with the owner, operator, and/or with the local municipality. The mitigation measures would have to form part of the respective stakeholder's expenditure predictions or operations and management within the area; therefore, the monitoring activities cannot be expressed in financial terms.

From a social perspective it can be concluded that the proposed Brakfontein Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the mine outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are implemented.

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

Dr Edward Matenga has been appointed by Wadala Mining to provide a Heritage and Palaeontological Impact assessment studies to highlight the heritage and palaeontological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the heritage and palaeontological diversity and status of the application area.

Heritage

This Heritage Impact Assessment (HIA) report has been prepared on behalf of Northern Spark Trading 428 (Pty) Ltd for a prospecting right application on the Remaining Extent of the Farm Brakfontein 276 in the Siyathemba Local Municipality, Northern Cape Province.

The heritage sensitivity of the property is summarised as follows:

The Stone Age

As a general observation, Stone Age material occurs in the Middle Orange River Valley as background scatters which are testimony to the foraging activities of stone age communities. This pattern was observed on the Farm Brakfontein 276 (Remaining Extent) where eight (8) out of 12 occurrences recorded were lithics. There was an occasional hand-axe (Site BKN12) probably dating to the transition from the Early Stone Age to the Middle Stone Age. Otherwise, the scrapers and blades, commonly encountered date to the Middle Stone Age/Late Stone Age period. None of the sites recorded warrant further action.

The Early Iron Age

No material dating to the Iron Age was found.

The Later Iron Age

No material dating to the Later Iron Age was found.

Burial grounds

No burial grounds were found or reported on the property.

Modern commercial farming

Two rectangular stone enclosures were recorded (BKN03 & BKN05). There is no reason to destroy these structures that are likely to be treasured in the future as a footprint of the development of commercial farming in the karoo. The chassis of an American manufactured vehicle was also noted an asset that commercial farmers would own in the 1950s and 1960s (BKN04).

Palaeontology

Prof Marion Bamford from Wits University was sub-contracted by Archaeological and Heritage Services Africa (Pty) Ltd to conduct a Palaeontological Impact assessment study to highlight the palaeontological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the palaeontological diversity and status of the application area.

A Palaeontological Impact Assessment was requested for the proposed Prospecting Right Application on the Remaining Extent of the Farm Brakfontein 276 near Prieska in the Siyathemba Local Municipality, Northern Cape Province.

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 development.

The proposed site lies on the potentially fossiliferous Dwyka Group rocks, Tertiary Calcretes and Quaternary alluvium. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer or other designated responsible person once excavations or mining activities have commenced. As far as the palaeontology is concerned, the impact is very low and the project should be authorised.

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 Dwyka Group tillites and sandstones or the sands and calcretes of the Tertiary-Quaternary. There is a very small chance that fossils may occur in features such as palaeo-pans or palaeo-dunes that could trap fossils are present as no such feature is visible in the satellite imagery. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the miners or environmental officer, or other responsible person once mining has commenced then they should be rescued, and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be low, therefore, as far as the palaeontology is concerned, the project should be authorised, and a prospecting permit granted.

Chance Find Protocol

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

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.
2. When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (stromatolites, plants, insects, bone or coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the trace fossils such as stromatolites in the dolomites or the

Quaternary bones, rhizoliths, traces. 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 contractor, environmental officer or miners then a qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Trace fossils, 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.

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

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

There are no alternatives, as the application area applied for is the area where the applicant could prove a diamond resource and has found potential for a diamond prospecting operation.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme

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

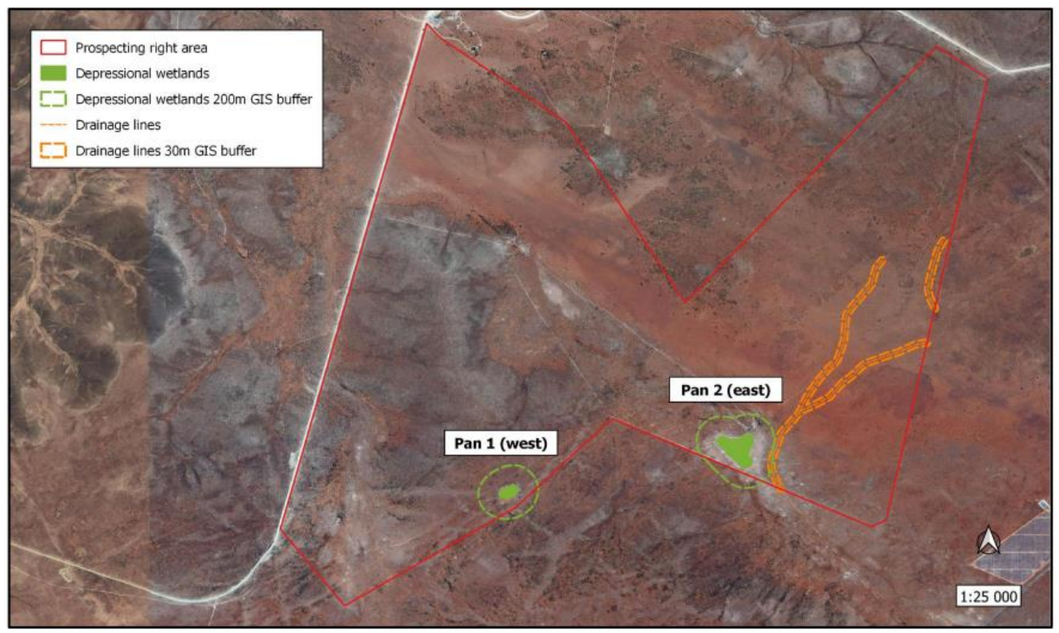
I hereby confirm that the requirement for the provision of the details and expertise of the EAP is already included in Part A as required.

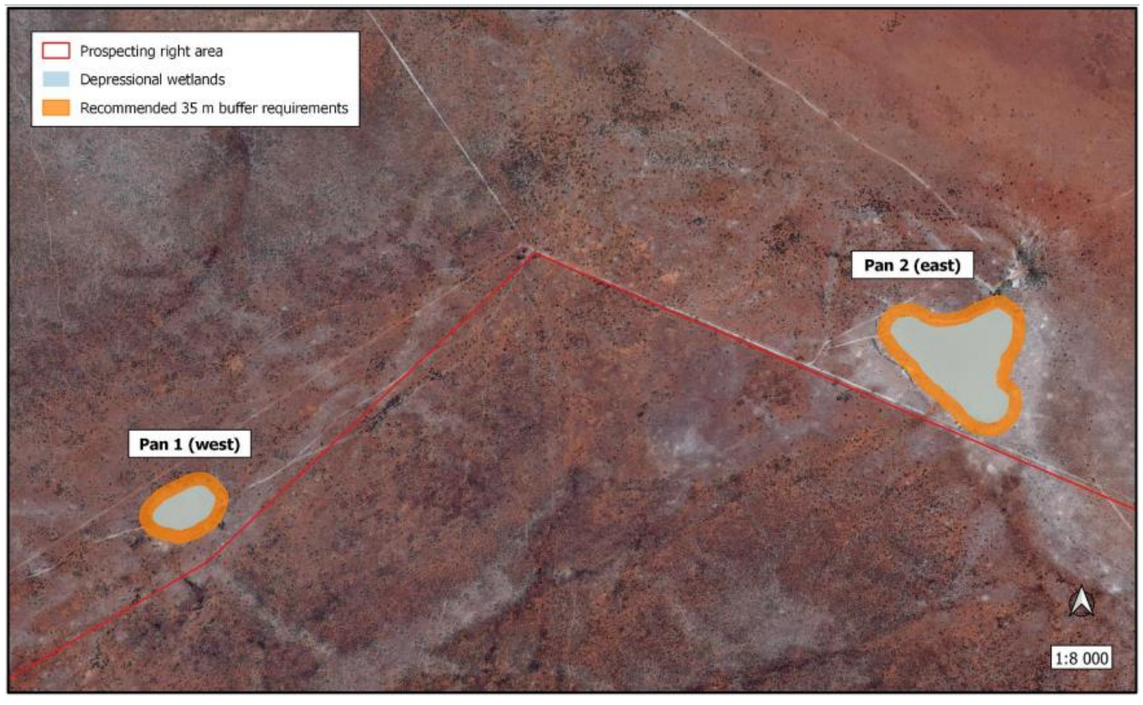
b) Description of the Aspects of the Activity (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

I hereby confirm that the requirement for the aspects of the activity is already included in Part A as required.

c) Composite Map

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





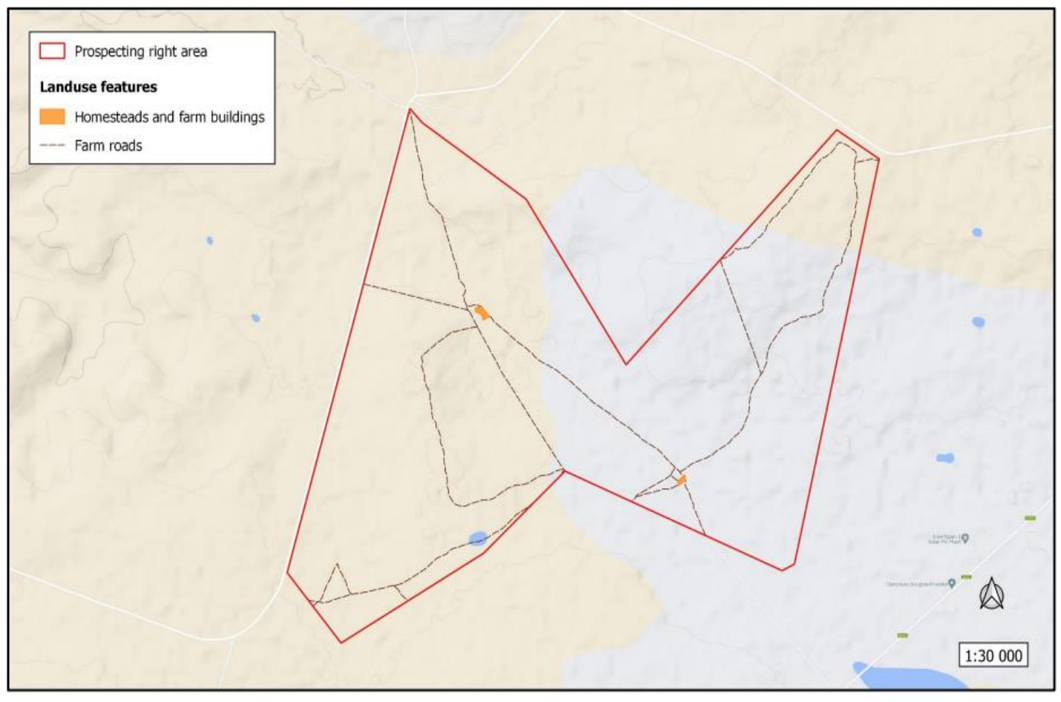


Figure 30. Composite maps for the prospecting area indicating buffers and existing infrastructure.

d) Description of impact management objectives including management statements

i) Determination of closure objectives (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The main closure objectives of the Company's planned prospecting operation are:

- To restore the site to its current land capability in a sustainable manner.
- To prevent the sterilization of any diamond reserves.
- To prevent the establishment of any permanent structures or features.
- To manage and limit any impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained when a closure certificate is issued.
- To establish a stable and self-sustainable vegetation cover.
- To limit and rehabilitate any erosion features and prevent any permanent impact to the soil capability.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the prospecting operation efficiently, cost effectively and in accordance with Government Policy.

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-sustainable state. Proof of this should be submitted at closure. Specific objectives include:

Rehabilitation of infrastructure areas

The objectives for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after mine closure is maintained until the issue of a closure certificate.
- The removal, decommissioning and disposal of all prospecting infrastructure, will comply with all conditions contained in the MPRDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:
- The plant and associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed, and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated.

- Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.
- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be decommissioned.

Mine Residue Dam

The objectives pertaining to the effective management and rehabilitation of the Mine Residue Dam include:

- To ensure that the Mine Residue Dam are stable and that there is an acceptably low risk of failure of this dam during the decommissioning phase and following mine closure; To establish self-sustainable vegetation cover on the Mine Residue dam so that the visual impact of the Mine Residue dam is improved and in order to prevent erosion.

Management principles pertaining to Mine Residue dam include:

- The Mine Residue dam will continuously be inspected by a suitable qualified person to ensure stability. If there are any signs of instability, the appropriate remedial measures will be implemented.
- Inspection and monitoring should continue until closure and rehabilitation.
- Any infrastructure or facilities that serve the Mine Residue dam will be maintained to ensure that they are both stable and functional.

Maintenance

The necessary agreements and arrangement will be made by the Brakfontein operation to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for three (3) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the rehabilitated areas, Residue dam, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetative re-growth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the prospecting activity to apply for closure of these different areas.

Performance assessments

As per the MPRDA and associated Regulations, as well as NEMA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, the Brakfontein operation will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMPR;
- Conduct performance assessments of this EMPR biennially; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will be biennially. An independent and competent person will undertake all performance assessments.

Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will be left in a stable, self-sustainable state. Proof of this will be submitted at closure. Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding landowners and land users. This should be done during the operational phase of the prospecting operation;
- Rehabilitate disturbed land to a state suitable for its post-closure uses;
- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives;
- Keep relevant authorities informed of the progress of the decommissioning phase;
- Submit monitoring data to the relevant authorities;
- Maintain required pollution control facilities and rehabilitated land until closure.

Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure. Management principles to achieve this include:

- The Brakfontein operation will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of prospect planning.
- Strategies for sustainable development have been and will continue to be developed by the project in collaboration with district and local authorities, local businesses and other interested parties. Early warning of impending closure will be given to IAPs.
- In conjunction with long-term closure planning, the operation will actively participate in regional and local planning to enhance the

economic benefits of the project through development of alternative forms of income generation.

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

There won't be a need for this, as based on the literature no pitting or trenching will go deep enough to encounter any groundwater.

iii) Potential risk of Acid Mine Drainage (Indicate whether or not the mining can result in acid mine drainage)

No potential risk for Acid Mine Drainage exists.

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

Not applicable, there is no potential risk of acid mine drainage.

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

Not applicable, there is no potential risk of acid mine drainage.

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

There is no residual or cumulative impact that may result from acid mine drainage.

vii) Volumes and rate of water use required for the mining, trenching or bulk sampling operation

There will be two 16 feet pans that will require water when bulk sampling is reached. The only other activity relating to the cost of water in the prospecting operation relates to dust suppression in the prospecting area and on the roads when hauling and transporting material to the processing plant on the farms as part of the rehabilitation process.

It must however be noted that the water supply to the activities will be sourced from the Orange River. The necessary Water Use Licence will be applied for.

The processing plant (diamond pan) scrubbers and final recovery will have an impact on the cost of water used. The cost of water will have an upward trend over time as a result of the national capacity and demand situation. Water are however recycled as far as possible and redirected to the processing plant.

viii) Has a water use licence been applied for?

A Water use Licence application (WULA) will be prepared and submitted as soon as the EIA EMP has been submitted as this document and the Right is a minimum requirement for the application.

ix) Impact to be mitigated in their respective phases

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

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc… etc… etc.).	**PHASE** of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure.	**SIZE AND SCALE** of disturbance (volumes, tonnages and hectares or m^2)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when Required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Processing Plant 2 x 16ft rotary pan plants with de-watering screens	Construction Commissioning Operational Decommissioning Closure	Steel, concrete, electric wires	Access control Maintenance of processing plant Dust control and monitoring		Removal of processing plant upon closure of prospecting right.

			Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		
Ablution facilities Chemical toilets	Construction Commissioning Operational Decommissioning Closure	Chemical toilets for	Maintenance of chemical toilets Removal of chemical toilets upon closure		Removal of chemical toilets upon closure of the Prospecting Right.
Clean & Dirty water systems: Berms	Construction Commissioning Operational Decommissioning Closure	This area also includes the re-fuel and lubrication station, wash bay and office area. Due to the nature of activity in this area, lining of this catchment dam is proposed. The storage water will be used for prospecting activities for example dust suppression,	Maintenance of berms and trenches Oil traps used in relevant areas. Drip trays used. Immediately clean hydrocarbon spill.		Upon cessation of the individual activity (continuous rehabilitation)

		prospecting process, wash bay, etc.			
Fuel Storage facility (Diesel tanks)	Construction Commissioning Operational Decommissioning Closure	Concrete, bricks, and steel	Maintenance of diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point Immediately clean hydrocarbon spill.		Removal of diesel tanks upon closure of Prospecting Right.
Prospecting Area.	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 20 hectares at any one time.	No dumping of materials prior to approval by exploration geologist. Proper planning of excavations Access control Dust control and monitoring Noise control and monitoring Continuous rehabilitation Stormwater run-off control Immediately clean hydrocarbon spill Drip trays Dump control and monitoring Erosion control		Upon cessation of the individual activity (continuous rehabilitation)

Salvage yard (Storage and laydown area)	Construction Commissioning Operational Decommissioning Closure	No construction material, area to be levelled with a grader and fenced with a gate and access control	Access control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill		Removal of fence around salvage yard and ripping of salvage yard area upon closure of the prospecting right.
Gravel Stockpile area	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 0.01ha for the stockpile area at any one time.	Dust control and monitoring Noise control and monitoring Drip trays Storm water run-off control. Immediately clean hydrocarbon spills. Rip disturbed areas to allow re-growth of vegetation cover		Ripping of stockpile area upon closure of prospecting right.
Waste disposal site (domestic and industrial waste):	Construction Commissioning Operational Decommissioning Closure	15m x 30m = 450m²	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals		Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.
Roads (both access and haulage road on the mine site):	Construction Commissioning Operational Decommissioning Closure	Additional mine haul road	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits		Upon cessation of the individual activity (continuous rehabilitation)

			Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		Ripping of roads upon closure of the prospecting right.
Workshop and Wash bay	Construction Commissioning Operational Decommissioning Closure	300m² Concrete and Steel	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills		Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right
Water distribution Pipeline	Construction Commissioning Operational Decommissioning Closure	HDPE Pipes	Maintain water pipeline and structures		Removal of pipeline upon closure of the prospecting right.
Water tanks:	Construction Commissioning Operational Decommissioning Closure	3m X 3m = 9m²	Maintain water tanks and structures		Removal of water tank and steel structure upon closure of the prospecting right.

e) Impact Management Outcomes

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

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….**	**ASPECTS AFFECTED**	**PHASE In which impact is anticipated (e.g. construction, commissioning, operational, Decommissioning, closure, post closure)**	**MITIGATION TYPE** (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	**STANDARD TO BE ACHIEVED (impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
Processing Plant 2 X 16 feet pans	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air Quality Fauna Flora Noise Soil Surface water Safety	Construction Commissioning Operational Decommissioning Closure	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				Selecting equipment with lower sound power levels; Installing silencers for fans; Develop a mechanism to record and respond to complaints. The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre- and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation.	

Ablution facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater	Construction Commissioning Operational Decommissioning Closure	Maintenance of sewage facilities on a regular basis. Removal of chemical toilets on closure	Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.
Clean & Dirty water systems:	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	Soil Groundwater Surface Water	Construction Commissioning Operational Decommissioning Closure	It will be necessary to divert storm water around dump areas by construction of a cut-off berm that will prevent surface run-off into the prospecting area. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used.	Safety ensured. Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				Immediately clean hydrocarbon spill. 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. The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre- and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic	

				functioning from the operation.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. 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.	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.
Prospecting Area	Dust Noise	Air quality Fauna Flora Groundwater	Commissioning Operational Decommissioning Closure	Access control Dust control and monitoring	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to

	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Noise and vibration Soil Surface Water Topography Safety		Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre-	infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation. Prospecting activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all	

				related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring 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. 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 Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks. It will be necessary to divert storm water around dump areas by construction of a temporary berm that will	

				prevent surface run-off into the drainage lines. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.	
Salvage yard (Storage and laydown area)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Minimize potential for hydrocarbon spills to infiltrate into groundwater Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

Gravel Stockpile area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met.
Roads (both access and haulage road on	Dust Noise	Air quality Fauna Flora	Construction Commissioning Operational Decommissioning	Maintenance of roads Dust control and monitoring	Dust levels minimized Minimize potential for hydrocarbon spills to

the prospecting site):	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Noise and vibration Soil Surface water	Closure	Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. 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.	infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives met. Erosion potential minimized.
Workshop and Wash bay	Removal and disturbance of vegetation cover and natural habitat of fauna	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Concrete floor with oil/water separator Storm water run-off control	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized

	Soil contamination			Immediately clean hydrocarbon spills	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Water distribution Pipeline	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Monitor pipeline for water leaks Maintenance of pipeline 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.	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Water tanks:	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Maintain water tanks and structures	Safety ensured. Rehabilitation standards and closure objectives to be met.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraph (c)

ACTIVITY **Whether listed or not listed.**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….**	**MITIGATION TYPE** (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	**TIME PERIOD FOR IMPLEMENTATION** **Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.**	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Processing Plant: 2 x 16ft rotary pan plants	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills	Removal of processing plant upon closure of Prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

	Soil contamination Surface disturbance	Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre-and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation.		Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Ablution Facilities Chemical Toilets.	Soil contamination Groundwater contamination	Maintenance of sewage facilities on a regular basis. Removal of facility on closure	Removal of facility upon closure of the Prospecting Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts;

				• Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Clean & Dirty water systems: Berms	Surface disturbance Groundwater Contamination	It will be necessary to divert storm water around prospecting areas by construction of a berm that will prevent surface run-off into the prospecting area.	Upon cessation of the individual activity (continuous rehabilitation)	The following must be placed at the site and is applicable to all activities: • Relevant Legislation;

	Soil contamination Surface water contamination	The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. 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. The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid	Levelling of stormwater berms upon closure of Prospecting Right	• Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

		climate, lack of organic soils, and limited human use. For both pans, a pre-and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation. Effluents and waste should be recycling and re-use as far as possible.		
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. 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.	Removal of diesel tanks upon closure of Prospecting Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees.

		Vehicles and machinery should be regularly serviced and maintained.		• The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Prospecting Area.	Dust 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 Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Upon cessation of the individual activity (continuous rehabilitation)	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto.

		The aquatic buffer segment identified for the depressional wetlands on Brakfontein have gentle sloping land and shallow, moderately drained soils. The wetland buffer requirements are low in general, due to the arid climate, lack of organic soils, and limited human use. For both pans, a pre-and post-mitigation buffer width of 35 m is deemed acceptable during the construction phase, and a 25 m during the operational phase to protect core wetland habitat and aquatic functioning from the operation. Prospecting activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance).		• Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

		Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring 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. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes to avoid the destruction of habitats and minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks. It will therefore be necessary to divert storm water around dump areas by construction of a berm that will prevent surface run-off into the drainage channels. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling,		

		levelling and re-vegetation where topsoil is washed away.		
Salvage yard (Storage and laydown area)	Surface Water contamination 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 Storm water run-off control Immediately clean hydrocarbon spill	Removal of fence around salvage yard and ripping of salvage yard area upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto.

				Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Stockpile area	Surface Water contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination		Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Waste disposal site (domestic and industrial waste):	Groundwater contamination Surface Water contamination Contamination of soil Surface water contamination	Storage of Waste within receptacles Storm water control Ground water monitoring Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

				Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Roads (both access and haulage road on the prospecting site):	Dust Surface Water contamination Groundwater contamination Noise	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills	Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's

	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. 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.		• SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Workshop and Wash bay	Surface Water contamination Removal and disturbance of vegetation cover	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations

	and natural habitat of fauna Soil contamination			• COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Water distribution Pipeline	Surface disturbance	Monitor pipeline for water leaks. Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water	Removal of pipeline upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts;

		management infrastructure is effective in controlling erosion.		• Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Water tanks:	Surface disturbance	Maintain water tanks and structures.	Removal of water tank and steel structure upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation;

				• Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

i) Financial Provision

(1) Determination of the amount of Financial Provision

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22(2)(d) as described in 2.4 herein.

The key aim of decommissioning and closure is to ensure that all the significant impacts are ameliorated, and that the environment is returned to its original state, based on the baseline information, as far as is practically possible. Therefore, all rehabilitated areas should be left in a stable, self-sustainable state and proof of this should be submitted at closure.

The baseline environmental information is usually determined by reviewing all applicable information available for the site and the overall region. This information is gathered through a combination of on-site observations, spatial information, and specialist baseline studies. Information regarding current land uses and existing biophysical environment gathered from interested and affected parties during the public consultation process are also taken into consideration when describing the baseline environment.

General closure objectives include the following:

Adhere to all statutory and other legal requirements.

Identify potential post-closure land uses in consultation with the future landowner, surrounding landowners and land users; well in advance, before closure and preferably during the operational phase of the operation;

Remove, decommission and dispose all infrastructures, and ensure that these processed comply with all conditions contained in the MPRDA.

Rehabilitate disturbed land to a state suitable for its post-closure uses, and which are stable, sustainable and aesthetically acceptable on closure.

Rehabilitate disturbed land and mine residue dam to a state that facilitates compliance with applicable environmental quality objectives;

Physically stabilise remaining structures to minimise residual risks;

Ensure the health and safety of all stakeholders during closure and post closure and that future land users are not exposed to unacceptable risks;

To alleviate the negative socio-economic impacts that will result from closure;

Promote biodiversity and ecological sustainability as far as practically possible;

Keep relevant authorities informed of the progress of the decommissioning phase;

To ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state, for two years after closure, or for long as deemed necessary at the time and to submit such monitoring data to the relevant authorities.

Maintain required facilities and rehabilitated land until closure.

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

The process as described by NEMA for Environmental Authorisation was followed. See table 3 for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted. The landowners and neighbours were consulted with a registered letter informing them that the application had been accepted and a Scoping Report were attached in which all activities were explained.

An Advert (Notice) was placed in the Gemsbok on 9 December 2022 to notify all other interested and affected parties that should wish to register for the project.

Registered consultation letters were posted on 5 December 2022 to all identified parties and government departments with a draft Scoping Report document attached.

A hard Copy Scoping Report was placed at the library in Prieska.

The document was also placed on the website of Wadala.

The document can also be viewed at the EAP address with prior arrangement to view the document.

The EIA EMP document was sent out to all identified and registered parties on 3 August 2023.

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

The consultation process is ongoing.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation of land disturbed by the operation during the life of the Prospecting Right will be accompanied by ongoing monitoring of the environment, until a stable state is reached. The main objectives are to have an uncontaminated, rehabilitated, and safe environment, and to restore the area and habitats to a condition acceptable for obtaining a closure certificate.

Final rehabilitation of the site is expected to be within 5 years after the right has been granted. Final rehabilitation will be executed systematically and will consist of the elements and procedures as listed below. More realistic closure elements will be fully determined by a Professional Mine Surveyor once the operation is active.

Dismantling of processing plant and related structures:

- The processing plant in total is expected to cover an area of 900 m2, of which all should be dismantled and removed. This includes related infrastructures, equipment, machinery, screening plant, and other items used during the processing activities, such as conveyor belts, pipelines and power lines.
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of steel buildings and structures:

- All steel buildings and structures are expected to amount to 100 **m2**. These include mobile stores, workshops, offices, ablutions, water tanks, etc. Those in disuse and which cannot be sold,

donated, or used for future purposes should be dismantled and removed or demolished.
- Any associated foundations associated with dismantled steel buildings and structures should also be demolished to 1 m below ground level;
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of reinforced concrete buildings and structures
- All brick buildings and concrete structures are expected to amount **to 0 m2**. These include French drains, wash bays, refuelling depots and concrete floors. Those in disuse and which cannot be donated or used for future purposes should be demolished.
- The foundations of these buildings should also be demolished and to a depth of 1 m below ground level;
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;

- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Rehabilitation of access roads
- Mine roads in total, is expected to cover an area of 2500 m2. After general site rehabilitation has been completed, all redundant roads should be ripped or ploughed.
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition and rehabilitation of electrified railway lines
- There are no electrified railway lines associated with the Prospecting activities.

Demolition and rehabilitation of non-electrified railway lines
- There are no non-electrified railway lines associated with the Prospecting activities.

Demolition of housing and/or administration facilities

- There are no other housing or administration facilities associated with the Prospecting activities, other than those in the form of mobile containers. These were however included in the section for demolition of steel buildings and structures.

Opencast rehabilitation including final voids and ramps

- Opencasts and ramps associated with the Prospecting activities are expected to cover 2ha at any one time.
- In-filling of the pits should take place concurrently and by obtaining material from the closest adjacent excess material heaps;
- The topography should then be shaped to the natural contours;
- The prepared surfaces should finally be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Sealing of shafts, audits and inclines

- There are no shafts associated with the Prospecting activities.

Rehabilitation of overburden and spoils

- The total final overburden and spoils are estimated to amount to 0.25 ha and includes waste dumps as well as earth walls. Pre-planning should be conducted in order decide the fate of these features. For example, if the material from these features will be used for in-filling, or if the features will remain after closure.
- The slopes of those features selected to remain after closure, should be downgraded to such an extent that they are not visually intrusive to the skyline after closure, and/or at least have an average outer slope of 1:3 (18°); or as predetermined by a specialist, depending on the type of material;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation, to ensure stability, improve the visual impact, and minimise erosion.

Rehabilitation of processing waste deposits and evaporation ponds with pollution potential

- No processing waste deposits and evaporation ponds with pollution potential are associated with the Prospecting activities.

Rehabilitation of processing waste deposits and evaporation ponds with no pollution potential

- The processing waste deposits on the Prospecting area is estimated to cover an area of ± 0.25 ha. Pre-planning should be conducted in order decide the fate of this feature. For example, if

the material from these features will be used for in-filling, or if the features will remain after closure.

- The toe trenches should be backfilled by obtaining material from the closest adjacent heaps deemed appropriate for such purpose;

The slopes of those features selected to remain after closure, should be downgraded to such an extent that they are not visually intrusive to the skyline after closure, and/or at least have an average outer slope of 1:3 (18°); or as predetermined by a specialist, depending on the type of material;

- For backfilled trenches the topography should be shaped to be in line with the natural contours, but where compaction occurred, the areas should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation, to ensure stability, improve the visual impact, and minimise erosion.

Storm water management
Storm water runoff arising from the upper and outer slopes of the rehabilitated residue deposit should be managed to
(1) prevent uncontrolled runoff from the residue deposit, which in turn creates surface erosion and resultant damage to the cover material and could also expose deposited material.
(2) route the runoff arising from the rehabilitated residue deposit into the surrounding surface water drainage regime in a manner that would limit the creation of secondary erosion in the receiving surface water environment and/or possible damage to downstream surface infrastructure; and
(3) allow for the control routing of the runoff collected on the rehabilitated residue deposit across cut-off, seepage or solution trenches provided to handle excess contaminated seepage from the residue deposit.

Rehabilitation of subsided areas
The EAP is not currently aware of any areas of subsidence on site. However, any potential for such occurrences should be actively investigated and should be included in the rehabilitation plan, when such areas are identified.

General surface rehabilitation

- Final surface rehabilitation of areas disturbed by prospecting and related activities should be aligned to the selected final land use.

General surface rehabilitation encompasses the reinstatement of natural topography, the top soiling, and the re-vegetation of all those areas where infrastructure have been dismantled and removed or demolished. It also includes any industrial waste or scrap material that need to be removed from site. The total area that will need general surface rehabilitation at the time mine closure is estimated to be ± 2 ha.

River diversions
No river diversions are planned.

Fencing
It is not known at this stage if any fencing is planned.

Water management
No treatment of water will be necessary for the Prospecting activities.

Maintenance and aftercare
Maintenance and aftercare should be planned for two to three years after prospecting production have ceased and should include the following:

- Annual fertilising of rehabilitated areas.
- Monitoring of surface and subsurface water quality,
- Control of alien plants, and
- General maintenance, including rehabilitation of cracks and subsidence.
- Erosion control and monitoring of the slopes of the Mine Residue dam;

Specialist study

- A screening level risk assessment should be completed by a specialist environmental practitioner during mine closure to ensure that all of the rehabilitation objectives have been met and that all of the potential risks have been eliminated and/or are controlled. This assessment should specifically emphasis on those risks relating to river disturbances, groundwater quality and slope stabilities, but should not neglect progress made in natural vegetation restoration or success in alien invasive eradications. The current average specialist fees are estimated at R 50 000.

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

The rehabilitation plan was primarily designed with the closure objectives in mind and therefore it relates to all the various objectives as set out above in Section 1) g) 1) a) of this EMPR. In general, the main objectives are to have an uncontaminated, rehabilitated, and safe environment, and to restore the prospecting area to a condition acceptable for obtaining a closure certificate. Each element in the rehabilitation plan was designed to meet these closure objectives.

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

The current, preliminary mine closure and rehabilitation costs amounts to R 828 017 (Please see table 11 below for calculation).

(b) Confirm that the financial provision will be provided as determined.

It is hereby confirmed that the financial provision will be provided as determined.

Table 11. Financial Quantum

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
Remark:							
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	900	18,42	1	1,1	18235,8
					1	1,1	
2 (A)	Demolition of steel buildings and structures	m2	100	256,63	1	1,1	28229,3
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	378,15	1	1,1	0
3	Rehabilitation of access roads	m2	2500	45,92	1	1,1	126280
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	445,73	1	1,1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	243,13	1	1,1	0
5	Demolition of housing and/or administration facilities	m2	0	513,26	1	1,1	0
6	Opencast rehabilitation including final voids and ramps	ha	2	261224,38	0,04	1,1	22987,74544
7	Sealing of shafts adits and inclines	m3	0	137,77	1	1,1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,25	179372,28	1	1,1	49327,377
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,25	223404,93	1	1,1	61436,35575
					1	1,1	
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	648873,81	1	1,1	0
					1	1,1	
9	Rehabilitation of subsided areas	ha	0	150197,24	1	1,1	0
10	General surface rehabilitation	ha	2	142093,10	1	1,1	312604,82
11	River diversions	ha	0	142093,1	1	1,1	0
12	Fencing	m	0	162,08	1	1,1	0
13	Water management	ha	0	54027,79	1	1,1	0
14	2 to 3 years of maintenance and aftercare	ha	0	18909,73	1	1,1	0
15 (A)	Specialist study	Sum	0			1,1	0
15 (B)	Specialist study	Sum	0			1,1	0
					Sub Total 1		619101,3982
1	Preliminary and General		37146,08389		weighting factor 2 1,05		39003,38809
2	Contingencies				61910,13982		61910,13982
					Subtotal 2		720014,93
					VAT (15%)		108002,24
					Grand Total		**828017**

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

g) Monitoring of Impact Management Actions
h) Monitoring and Reporting Frequency
i) Responsible persons
j) Time Period for Implementing Impact Management Actions
k) Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Topography	To minimise the reduction of land capability.	To ensure that rehabilitation post-prospecting slopes are stable, free draining and no slopes have an angle in excess of 20°.	Site Manager/ Environmentalists	Monitoring will be done on an *annual basis* to ensure that the levels and the slopes are in order.
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and To reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.	Site Manager/ Environmentalists	Monitoring will be done on an *annual basis* or after a heavy rain event.
Air Quality	To control the incidence of unacceptable levels of dust pollution on site.	To ensure that the mine minimizes dust omissions, so that dust does not become a nuisance for affected parties and a health hazard.	Site Manager/Foreman appointed SHE Consultant	Visual inspections will be done and managed by dust suppression by a water tanker. Quarterly tests will also be conducted by a Safety Health and Environmental Consultant and submitted to Mine

				Health and Safety for monitoring purposes.
Fauna	To minimise vegetation destruction in prospecting areas, and therefore a habitat for wildlife; and To eliminate poaching and the extermination of animal species within the boundaries of the study area as well as the surrounding areas.	To ensure that the species diversity and abundance is not significantly reduces.	Site Manager/ Environmentalists	Monitoring will be done at rehabilitated area on an *annually basis* to investigate species diversity and abundance.
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining.	Site Manager/ Environmentalists	Monitoring will be done at the rehabilitated areas on a *twice a year basis* (mid-summer and mid-winter), where species diversity and vegetation cover will be investigated.
Noise and Vibration	To ensure that the legislated noise and ground vibration levels will be adhered to at all times. To control the incidence of unacceptable noise levels on site.	The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant and that which may migrate outside the plant area.	The responsible person during the construction phase and the responsible person (Engineering/ Environmental Department) during the Operational phase of the project. The site engineer and independent qualified environmental noise and vibration specialist.	Quarterly reports on fall-out noise monitoring will be conducted as required by legislation. If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.
Surface Water	To conserve water; and	The Orange River, is about 5km away from the site. A drainage	Site Manager/Water Supply	The Orange River is perennial. Monitoring takes place by collecting

	To eliminate the contamination of run-off.	lines and two pans occur in the study area. The Orange River will be monitored by collecting surface water samples during the rainy season.		surface water samples quarterly out of the Orange River.

l) Indicate the frequency of the submission of the performance assessment report

Auditing of compliance with environmental authorisation, the environmental management programme and the closure plan should be conducted biennially by an independent EAP and an Environmental Audit Report should be compiled in such a way that it meets the requirements in terms of Regulation 34 of the National Environmental Management Act 107 of 1998): Environmental Impact Assessment Regulation, 2014.
The rehabilitation plan should also be reviewed biennially in order to fulfil the requirements of Section 41(3) of the MPRDA and should be conducted by an independent EAP. Subsequently, an Annual Rehabilitation Plan should be developed to meet the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).
These reports should be submitted biennially to the Northern Cape DMR offices in Kimberley.

m) Environmental Awareness Plan

The objective of the environmental awareness plan is to ensure that:

- Training needs are identified and all personnel whose work may create a significant impact upon the environment have received appropriate training;
- All employees are aware of the impact of their activities.
- Procedures are established and maintained to make appropriate employees aware of:
    - The significant environmental impacts (actual or potential) of their work activities and environmental benefits of improved personal performance,
    - Their roles and responsibilities in achieving conformance with environmental policies, procedures, and any implementation measures,
    - The potential consequences of departure from specified operating procedures.
- Personnel performing tasks, which can cause significant environmental impacts, are competent in terms of appropriate education, training and / or experience.

Environmental awareness will be part of the existing training and development plan. Key personnel with environmental responsibilities will be identified and the following principles will apply:

- Procedures will be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness will focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;

Top management will build awareness and motivate and reward employees for achieve environmental objectives;

- Environmental policies will be availed to prospecting employees and contractors;
- Environmental inductions will be conducted for employees, contractors and visitors;
- There will be an ongoing system of identifying training needs.

General environmental awareness training as part of the induction at the Brakfontein operations should focus on the following:

- General environmental awareness
- The mine policies and vision concerning environmental management.
- Legal requirements
- Prospecting activities and their potential impacts
- Different management measures to manage identified impacts
- Mine personnel's role in implementing environmental management objectives and targets.

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

It is the responsibility of management to ensure that all employees, contractors and visitors are trained to understand the impacts of their tasks on the environment and to reduce them wherever possible. Environmental awareness should be part of the existing training and development plan. Key personnel with environmental responsibilities should be identified and the following principles should be applied:

- Procedures should be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness should focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;
- Top management should build awareness and motivate and reward employees for achieving environmental objectives;
- There should be an ongoing system of identifying training needs.
- An environmental, health and safety induction programme should be provided to all employees, contractors and visitors prior to commencing work or entering the site, and they should sign acknowledgement of the induction. An attendance register and agenda/programme should be filed for each induction.
- A daily "toolbox talk" should be held prior to commencing work, which will include discussions on health, safety and environmental considerations. The toolbox talks should be led by the site manager or the appointed supervisor/s.
- Refresher training should also be given to permanent employees and long-term contractors on an annual basis, to ensure that all are competent to perform their

duties, thereby eliminating negative impacts on their safety, health and environment.

General environmental awareness training as part of the induction at Brakfontein should focus on the following:

- General environmental awareness, which incorporates environmental, ecological and heritage elements;
- The mine policies and vision concerning environmental management;
- Legal requirements;
- Mine activities and their potential impacts;
- Different management measures to manage identified impacts;
- Mine personnel's role in implementing environmental management objectives and targets.

Environmental awareness topics to be covered in training should include:

- Natural resource management and conservation;
- Biodiversity awareness and conservation principles;
- Heritage resource awareness and preservation principles;
- Hazardous substance use and storage;
- Waste management; and
- Incident and emergency actions and reporting;

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

Environmental incident reporting will be a vital part of communication in order to deal with risks and ultimately avoid pollution or the degradation of the environment. Such communication should take place through the management, administrative and worker sectors of the operation, as well as contractors and visitors. Employees should be required to report any and all environmentally related problems, incidents and pollution, so that the appropriate mitigation actions can be implemented timeously. In the event of an environmental incident, the reporting procedure as indicated in the table below should be followed.

ENVIRONMENTAL INCIDENT REPORTING STRUCTURE	ACTIONS REQUIRED
Person causing or observing the incident	The first person causing or observing the incident shall report the incident to an immediate supervisor where the environmental incident is observed.
Line management in the relevant area of responsibility where the incident occurred	Line management in the relevant area of responsibility where the incident occurred shall: • Investigate the incident and record the following information: - How the incident happened; - The reasons the incident happened; - How rehabilitation or clean up needs to take place; - The nature of the impact that occurred; - The type of work, process or equipment involved; - Recommendations to avoid future such incidents and/or occurrences; • Inform the environmental manager/ECO and the Operations Manager on a daily basis of all incidents that were reported on site; • Consult with the relevant department/person for recommendations on actions to be taken or implemented where appropriate (e.g. clean-ups). • Assist the Environmental Manager and/or Operations Manager with applicable data in order to accurately capture the incident into the reporting database; • Ensure that remediation measures are implemented as soon as possible.

Site managers	The site managers shall: • Forward a copy of the incident form to other line managers; • Forward a copy of the incident form to the Environmental manager/ECO; • Inform the relevant department/person on a weekly basis of the incident by e-mail or by submitting a copy of the incident report. Once a High Risk Incident (any incident which results from a significant aspect and has the potential to cause a significant impact on the environment) occurred it must be reported immediately to the Environmental Manager and the Operations Manager by telephone or email to ensure immediate response/action. • Forward a copy of the completed Incident Reporting Form (and where applicable a copy of the incident investigation) to the relevant department/person.
Environmental manager/ECO	The appointed environmental manager or ECO shall: • Complete an incident assessment form to assess what level of incident occurred; • Make recommendations for clean-up and/or appropriate alternate actions; • Enter actions necessary to remediate environmental impacts into the database in conjunction with the responsible line manager; • Enter the incident onto the database in order to monitor the root causes of incidents; • Include the reported incidents in an appropriate monthly/quarterly report; • Highlight all incidents for discussion at HSEC meetings.

n) Specific information required by the Competent Authority

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

According to Section 41(3) of the MPRDA the holder of a prospecting right must annually assess (and revise, if necessary) the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure) as well as the end-of-operation liability.

An Annual Rehabilitation Plan should be developed to match the various requirements set out in the NEMA regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).

An environmental audit report will be done biennially (every second year).

Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the site at that time.

It is hereby confirmed that the financial provision shall be reviewed annually.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports;

b) the inclusion of comments and inputs from stakeholders and I&APs;

c) the inclusion of inputs and recommendations from the specialist reports where relevant; and

d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

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Signature of the Environmental Assessment Practitioner:

Wadala Mining and Consulting Pty Ltd

_____

Name of Company:

Date: 3 August 2023

- END –