



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

## **BASIC 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 LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

**NAME OF APPLICANT: XHARIEP PLANT AND MINING (PTY) LTD**

**TEL NO: 053 874 3820**

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**POSTAL ADDRESS: P.O. BOX 1776, KIMBERLEY, 8300**

**PHYSICAL ADDRESS: 1 UITZICHT STREET, ROYLGLEN, KIMBERLEY, 8301**

**FILE REFERENCE NUMBER SAMRAD: (NC) 30/5/1/1/2/13295 PR**

## IMPORANT NOTICE

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

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

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

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

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

## OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process:-

- a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- b) identify the alternatives considered, including the activity, location, and technology alternatives;
- c) describe the need and desirability of the proposed alternatives;
- d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
  - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - (ii) the degree to which these impacts:-
    - (aa) can be reversed;
    - (bb) may cause irreplaceable loss of resources; and
    - (cc) can be managed, avoided or mitigated;
- e) through a raking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to:-
  - (i) identify and motivate a preferred site, activity and technology alternative;
  - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
  - (iii) identify residual risks that need to be managed and monitored.

**PART A**  
**SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT**

Contact Person and correspondence address:

**a) Details of:**

**i) The EAP who prepared the report:**

Name of the Practitioner: M and S Consulting (Pty) Ltd  
 Tel No: 053 861 1765  
 Fax No: 086 636 0731  
 Cell No: 084 444 4474 – Ms. T. Jooste  
 E-Mail address: ms.consulting@vodamail.co.za

**(i) Expertise of the EAP:**

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

(With evidence attached as Appendix 1)

- Professional registration of EAP:  
 Ms. Jooste is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Reg. No. 2019/1983).
- The qualifications of the EAP:
  - Fourteen years professional experience, in terms of Section 15(1) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Section 24H Registration Authority Regulations as published on 22 July 2016 under Government Gazette No. 40154 (849);
  - Environmental Management Certificate; and
  - BA in Environmental Management.

**(2) Summary of the EAP's past experience:**

(Attach the EAP's curriculum vitae as Appendix 2)

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.

**b) Location of the overall activity:**

Farm Name:	Portion 32 of the Farm 703 Remaining Extent of Portion 59 of the Farm 703 Portion 116 of the Farm 703
Application area (Ha)	11 230.5057 Hectares
Magisterial district:	Kuruman
Distance and direction from nearest town	The application area is situated approximately 50km north-west of the town of Hotazel in the Northern Cape Province. Access to the site can be obtained from the R380 between Hotazel and the Botswana border.

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21 digit Surveyor General Code for each farm portion	C0410000000070300032 C0410000000070300059 C0410000000070300116
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**c) Locality Map:**

(show nearest town, scale not smaller than 1:250 000 attached as Appendix 3)

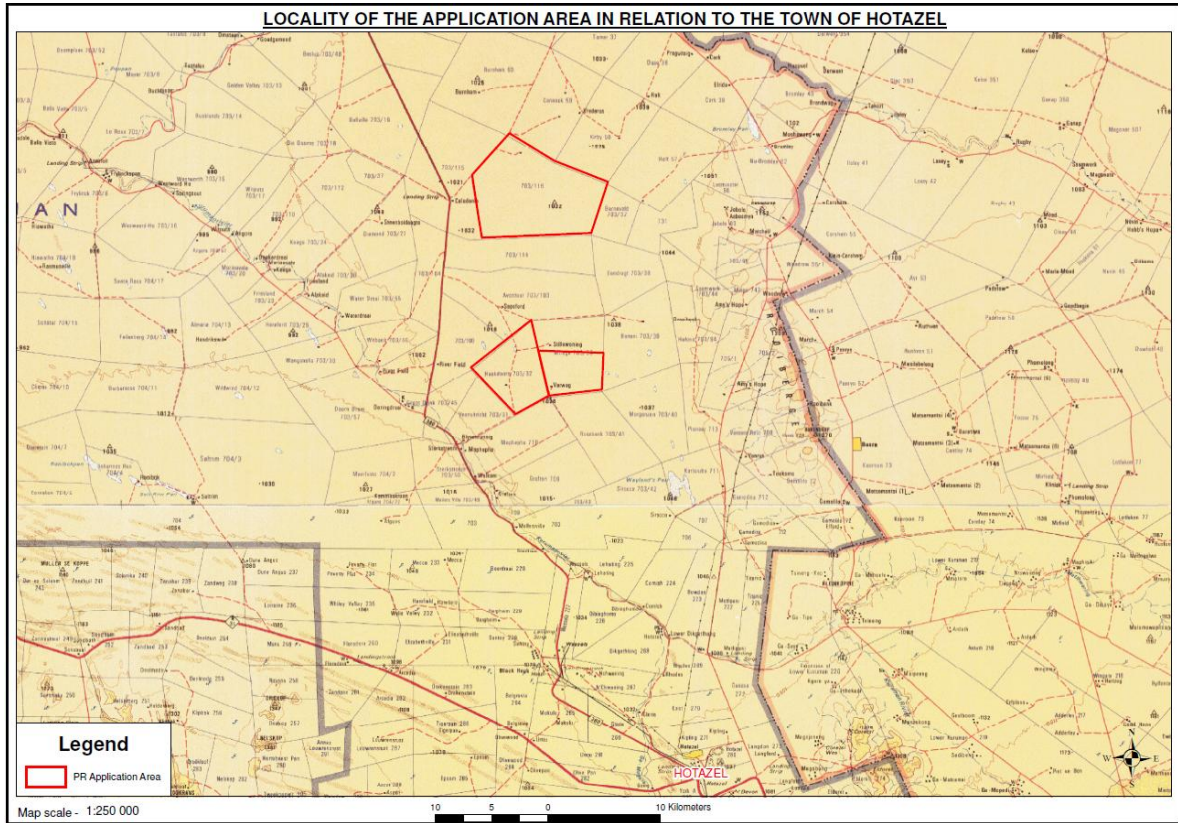


Figure 1 – Locality Map

**d) Description of the scope of the proposed overall activity:**

**i) Listed and specified activities:**

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

The final site layout can only be determined during active prospecting as set out below:

- The first phase of the proposed prospecting activities entails a reconnaissance visit.
- The second phase of the proposed prospecting activities entails the review of historical activities and data, a desktop study as well as geological mapping by a Geologist. The exact locality of the proposed first phase percussion boreholes can only be determined during this phase.
- The exact locality of the proposed second phase percussion boreholes can only be determined after the first phase drilling has been completed and the samples analysed.

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- The exact locality of the proposed third phase percussion boreholes can only be determined after the second phase drilling has been completed and the samples analysed.

No offices and storerooms will be established at the site as Xhariep Plant and Mining (Pty) Ltd (hereinafter referred to as 'Xhariep') shall make use of facilities in the town of Hotazel.

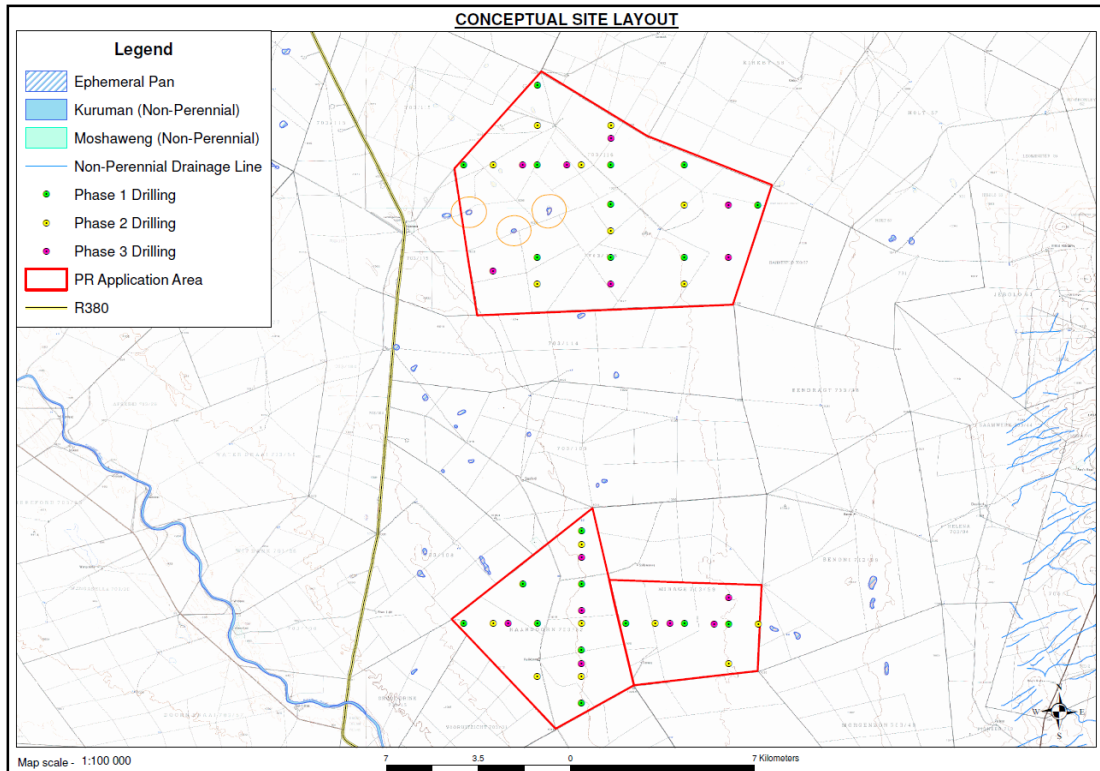


Figure 2 – Conceptual site layout plan

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Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)		Aerial extent of the activity (Ha or m <sup>2</sup> )	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed)
1	Percussion boreholes (50 boreholes with a 20m x 20m surface disturbance around each hole)	20 000m <sup>2</sup> (2 Ha)	X	GNR327 – Activity 20 GNR327 – Activity 27
2	Access tracks: - Existing roads will be used as far as possible. - It is anticipated that 500m long and 3m wide two-spoor access tracks will be created to access borehole localities.	1 500m <sup>2</sup> (0.15 Ha)	X	GNR327 – Activity 20 GNR327 – Activity 27
3	Chemical toilets	6m <sup>2</sup> each		
<b>Full description of listed activities applied for:</b>				
<p>Full description of listed activities:</p> <ul style="list-style-type: none"> <li>- GNR 327 – Activity 20: Any activity including the operation of that activity which requires a prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including <ul style="list-style-type: none"> <li>a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or including activities for which an exemption has been issued in terms of Section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);</li> <li>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, reduction, refining, calcining or gasification of the mineral resource in which case Activity 6 of Listing Notice 2 applies.</li> </ul> </li> <li>- GN327: Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for:- <ul style="list-style-type: none"> <li>(i) the undertaking of a linear activity; or</li> <li>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</li> </ul> </li> </ul>				

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**(ii) Description of the activities to be undertaken:**

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

Xhariep's prospecting activities for Cobalt, Diamond (Alluvial, General, In Kimberlite), Gold Ore, Iron Ore, Manganese Ore, Platinum Group Metals and Zinc Ore shall be conducted in nine phases over a period of five years.

Phase	Activity  (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required  (refers to the competent personnel that will be employed to achieve the required results)	Timeframe  (in months) for the activity)	Outcome  (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome  (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome?  (e.g. geologist, mining engineer, economist, etc)
1	<b>Non-invasive Prospecting</b> Reconnaissance visit	Geologist	Month 1	Memorandum to address any problems	Month 2	Geologist
2	<b>Non-invasive Prospecting</b> Review of historical activities; Desktop study; and Geological Mapping	Geologist	Month 2 - 12	Map & Report	Month 13	Geologist
3	<b>Invasive Prospecting</b> Phase 1 Percussion drilling	Geologist & Drilling contractor	Month 13 - 24	Drill logs	Month 24	Geologist
4	<b>Non-invasive Prospecting</b> Analysis of drill samples	Laboratory	Month 13 – 24 (Concurrent with drilling)	<ul style="list-style-type: none"> <li>• Analyses sheets</li> <li>• Laboratory report</li> <li>• Map</li> <li>• Report</li> </ul>	Month 24	Laboratory & Geologist
5	<b>Invasive Prospecting</b> Phase 2 Percussion drilling	Geologist & Drilling contractor	Month 25 – 36	Drill logs	Month 36	Geologist
6	<b>Non-invasive Prospecting</b> Analysis of drill samples	Laboratory	Month 25 – 36 (Concurrent with drilling)	<ul style="list-style-type: none"> <li>• Analyses sheets</li> <li>• Laboratory report</li> <li>• Map</li> <li>• Report</li> </ul>	Month 36	Laboratory & Geologist
7	<b>Invasive Prospecting</b> Phase 3 Percussion drilling	Geologist & Drilling contractor	Month 37 - 48	Drill logs	Month 48	Geologist
8	<b>Non-invasive Prospecting</b> Analysis of drill samples	Laboratory	Month 37 - 48 (Concurrent with drilling)	<ul style="list-style-type: none"> <li>• Analyses sheets</li> <li>• Laboratory report</li> <li>• Map</li> <li>• Report</li> </ul>	Month 48	Laboratory & Geologist
9	<b>Non-Invasive Prospecting</b> Consolidation and interpretation of results / data	Geologist	Month 49 - 60	Feasibility Report	Month 60	Geologist & CEO

- Non-invasive prospecting:

Phase 1:

A site investigation of the application area will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Phase 2:

In order to direct the exploration programme in an efficient manner, there will be a review of all available information and data. A desktop study will be undertaken of the metal potential of the area.

Any anomalous features identified will be mapped in detail. The various rock types and their contacts will also be mapped.

Phases 4, 6 and 8:

Drill samples will be collected in one-meter intervals and logging will be done by a qualified geologist who will record the lithology, mineralogy, degree of mineralization and structural features. Mineralized samples will be analyzed at an internationally recognized (ISO certified) laboratory.



Phase 9:

All the drill sampling data will then be modeled to obtain a final interpretation of the potential of the deposit. A detailed feasibility report will be compiled after drilling operations have been completed to evaluate the economic viability of the project.

- Invasive prospecting:

Phases 3, 5 and 7: Percussion drilling

Percussion drilling will be used to identify the position of a suspected base metal deposit. The position of the boreholes is dependent on the results of the review of historical activities, geological mapping, desktop study and reconnaissance visit.

Fifty boreholes, approximately 50m deep each (can be more or less depending on results), are planned. The collar position of all boreholes will be surveyed. All drilling will be short term and undertaken by a contractor using truck-mounted equipment.

Angled percussion holes are planned to locate and intersect the mineralization. A traverse line or grid drilling is used to identify and define the extent of any mineralization. The sizes of the boreholes drilled will be determined by such factors as cost, proposed sampling, availability of drilling machines and the volume of sample required, among others.

Each drill site will be rehabilitated. The boreholes will be filled with drill chips and covered with topsoil.

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**e) Policy and Legislative Context:**

Applicable Legislation and Guidelines used to compile the report <small>(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.)</small>	Reference where applied
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations	<ul style="list-style-type: none"> <li>- Section 5: Implementation of control measures for alien and invasive plant species;</li> <li>- Section 6: Control measures.</li> <li>- Regulation GN R1048, published on 25 May 1984, in terms of CARA</li> </ul>
Constitution of South Africa (Act 108 of 1996)	<ul style="list-style-type: none"> <li>- Section 24: Environmental right</li> <li>- Section 25: Rights in Property</li> <li>- Section 27: Water and sanitation right</li> </ul>
Environment Conservation Act (Act 73 of 1989) and Regulations	<ul style="list-style-type: none"> <li>- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities.</li> <li>- Section 28A: Exemptions.</li> </ul>
Fencing Act (Act 31 of 1963)	<ul style="list-style-type: none"> <li>- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.</li> </ul>
Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	<ul style="list-style-type: none"> <li>- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.</li> </ul>
Intergovernmental Relations Act (Act 13 of 2005)	<ul style="list-style-type: none"> <li>- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.</li> </ul>
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	<ul style="list-style-type: none"> <li>- Entire Act.</li> </ul>
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	<ul style="list-style-type: none"> <li>- Entire Act.</li> <li>- Regulations GN R527</li> </ul>
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	<ul style="list-style-type: none"> <li>- Section 2: Strategic environmental management principles, goals and objectives.</li> <li>- Section 24: Foundation for Environmental Management frameworks.</li> <li>- Section 24N:</li> <li>- Section 24O:</li> </ul>

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	<ul style="list-style-type: none"> <li>- Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care.</li> <li>- Regulations GN R547, published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations)</li> <li>- Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities)</li> <li>- Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal)</li> <li>- Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption)</li> <li>- Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations)</li> <li>- Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)</li> </ul>
<p>National Environmental Management: Air Quality Act (Act 39 of 2004)</p>	<ul style="list-style-type: none"> <li>- Section 32: Control of dust</li> <li>- Section 34: Control of noise</li> <li>- Section 35: Control of offensive odours</li> <li>- 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)</li> <li>- Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)</li> </ul>
<p>National Environmental Management: Biodiversity Act (Act 10 of 2004)</p>	<ul style="list-style-type: none"> <li>- 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.</li> <li>- Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process.</li> <li>- A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations.</li> </ul> <p>Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007</p>

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	<p>Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 *</p> <p>Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 *</p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.</li> <li>- Regulation GN R151, published on 23 February 2007 (List fo Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM:BA</li> <li>- Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA</li> <li>- Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)</li> </ul>
<p>The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa’s natural biodiversity and its landscapes and seascapes.</p>	<ul style="list-style-type: none"> <li>- Chapter 2 lists all protected areas.</li> </ul>
<p>National Environmental Management: Waste Management Act (Act 59 of 2008)</p>	<ul style="list-style-type: none"> <li>- Chapter 4: Waste management activities</li> <li>- Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations)</li> <li>- Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities)</li> <li>- 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)</li> <li>- Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations)</li> <li>- Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles)</li> </ul>

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	<ul style="list-style-type: none"> <li>- Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)</li> </ul>
National Forest Act (Act 84 of 1998) and Regulations	<ul style="list-style-type: none"> <li>- 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.</li> </ul>
National Heritage Resources Act (Act 25 of 1999) and Regulations	<ul style="list-style-type: none"> <li>- 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.</li> <li>- 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 palaeontological site.</li> <li>- 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.</li> <li>- 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.</li> <li>- Regulation GN R548 published on 2 June 2000 in terms of NHRA</li> </ul>
National Water Act (Act 36 of 1998) and and regulations as amended, <i>inter alia</i> Government Notice No. 704 of 1999	<ul style="list-style-type: none"> <li>- Section 4: Use of water and licensing.</li> <li>- Section 19: Prevention and remedying the effects of pollution.</li> <li>- Section 20: Control of emergency incidents.</li> <li>- Section 21: Water uses In terms of Section 21 a licence is required for: <ul style="list-style-type: none"> <li>(a) taking water from a water resource;</li> <li>(b) storing water;</li> <li>(c) impeding or diverting the flow of water in a watercourse;</li> <li>(f) Waste discharge related water use;</li> <li>(g) disposing of waste in a manner which may detrimentally impact on a water resource;</li> <li>(i) altering the bed, banks, course or characteristics of a watercourse;</li> </ul> </li> </ul>

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	<ul style="list-style-type: none"> <li>(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;</li> <li>- Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)</li> <li>- Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered)</li> <li>- Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams)</li> <li>- Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j))</li> <li>- Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b) )</li> <li>- Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 ( c ) and (i) – rehabilitation of wetlands)</li> <li>- Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 ( c ) and (i) )</li> <li>- 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))</li> </ul>
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.
Northern Cape Nature Conservation Act (Act 9 of 2009)	- Addresses protected species in the Northern Cape and the permit application process related thereto.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	<ul style="list-style-type: none"> <li>- Section 8: General duties of employers to their employees.</li> <li>- Section 9: General duties of employers and self-employed persons to persons other than their employees.</li> </ul>
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.
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).
National Land Transport Act, (Act 5 of 1998)	
Northern Cape Planning and Development Act (Act 7 of 1998)	- To control planning and development
Spatial Planning and Land Use Management (Act 16 of 2013)	- To provide a framework for spaital planning and land use management in

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(SPLUMA) and regulations	<ul style="list-style-type: none"> <li>- the Republic;</li> <li>- To specify the relationship between the spatial planning and the land use management, amongst others</li> <li>- Regulations GN R239 published on 23 March 2015 in terms of SPLUMA</li> </ul>
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	<ul style="list-style-type: none"> <li>- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land</li> </ul>
Basic Conditions of Employment Act (Act 3 of 1997) ) as amended	<ul style="list-style-type: none"> <li>- To regulate employment aspects</li> </ul>
Community Development (Act 3 of 1966)	<ul style="list-style-type: none"> <li>- To promote community development</li> </ul>
Development Facilitation (Act 67 of 1995) and regulations	<ul style="list-style-type: none"> <li>- To provide for planning and development</li> </ul>
Development Facilitation (GN24, PG329, 24/07/1998)	<ul style="list-style-type: none"> <li>- Regulations re Northern Cape LDO's</li> </ul>
Development Facilitation (GNR1, GG20775, 07/01/2000)	<ul style="list-style-type: none"> <li>- Regulations re application rules S26, S46, S59</li> </ul>
Development Facilitation (GN732, GG14765, 30/04/2004)	<ul style="list-style-type: none"> <li>- Determines amount, see S7(b)(ii)</li> </ul>
Land Survey Act (Act 8 of 1997) ) and regulations, more specifically GN R1130	<ul style="list-style-type: none"> <li>- To control land surveying, beacons etc. and the like;</li> <li>- Agriculture, land survey S10</li> </ul>
National Veld and Forest Fire Act (Act 101 of 1998) ) and regulations, more specifically GN R1775	<ul style="list-style-type: none"> <li>- To regulate law on veld and forest fires</li> <li>- (Draft regulations s21)</li> </ul>
Municipal Ordinance, 20/1974	<ul style="list-style-type: none"> <li>- To control pollution, sewers etc.</li> </ul>
Municipal Ordinance, PN955, 29/08/1975	<ul style="list-style-type: none"> <li>- Nature conservation Regulations</li> </ul>
Cape Land Use Planning Ordinance, 15/85	<ul style="list-style-type: none"> <li>- To control land use planning</li> </ul>
Cape Land Use Planning Ordinance, PN1050, 05/12/1988	<ul style="list-style-type: none"> <li>- Land use planning Regulations</li> </ul>

**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.)

In terms of the Environmental Impact Assessment Regulations, 2014 (GG38282, Government Notice No. R. 982) the need and desirability of any development must be included in the relevant reports to be submitted to the competent authority.

Assessment of the geological information available has determined that the area in question may have various mineral targets. In order to ascertain the above and determine the nature, locality and extent of the mineral targets within the prospecting area, it will be necessary that prospecting be undertaken. The prospecting will also determine if there are any features that may have an impact on the economic extraction of the minerals.

The information that will be obtained from the prospecting to be done will be necessary to determine, should the minerals be found, how and where the minerals will be extracted and how much economically viable mineral reserves are available within the proposed prospecting area.

Should the minerals applied for be found in the application area, Xhariep will be able to ensure employment opportunities and support to the local business for a certain period of time.

Xhariep expects that substantial benefits from the project (should the minerals applied for be found) will accrue to the immediate project area, the sub-region and the Northern Cape Province. These benefits must be offset against the costs of the project, including the impact to the surface owner.

**g) Motivation for the overall preferred site, activities and technology alternative:**

- The property on which or location where it is proposed to undertake the activity:  
The Geological formation supports the possibility that the minerals applied for could be found within the application area.
- The operational aspects of the activity:  
Xhariep aims to minimize its impact on the natural environment as much as possible and as such has opted to only use drilling as an invasive prospecting method.
- The technology to be used in the activity:  
A percussion drill rig will be used during phases 3, 5 and 7 of the prospecting activities. There are no alternatives to these types of drill rigs that will ensure high quality samples for analysis.



**h) Full description of the process followed to reach the proposed preferred alternatives within the 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.)

**(i) Details of all alternatives considered:**

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

**(a) The property on which or location where it is proposed to undertake the activity:**

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

Property description	District	Title Deed	Extent (Ha)
Portion 32 of the Farm 703	Kuruman	T1404/1987	2 733.9088
Remaining Extent of Portion 59 of the Farm 703	Kuruman	T759/2006	1 705.2953
Portion 116 of the Farm 703	Kuruman	T377/1996	6 791.3016

Alternatives considered:-

Xhariep has considered the following alternatives:

- The Geological formation that supports the possibility that the minerals applied for could be found within the area.
- The availability of farms within the area that is not already occupied by existing prospecting or mining rights.
- The availability of infrastructure, such as a road network, in the immediate surrounding area, which could be utilized to allow easy access to the site.

Taking the above into consideration, Xhariep opted to apply for the properties as above.

**(b) The type of activity to be undertaken:**

Prospecting activities for Cobalt, Diamond (Alluvial, General, In Kimberlite), Gold Ore, Iron Ore, Manganese Ore, Platinum group Metals and Zinc Ore are to take place in the form of percussion drilling.

Alternatives considered:-

The only alternative land use is livestock and game farming; however the applicant's main economic activity is prospecting / mining and for this reason does not favour any other alternative land use.

**(c) The design or layout of the activity:**

Infrastructure: No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Hotazel.

Invasive prospecting: The proposed locality of the exploration boreholes has been placed on a wide grid to determine the economic potential. The final locality of the exploration holes can only be determined after the desktop studies and geological mapping have been completed.

Alternatives considered:-

Infrastructure: The only alternative considered was the establishment of offices and storerooms on the farms under application. As Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

Invasive prospecting: The drilling of boreholes over the entire property was considered, but taking into account that Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

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

A percussion drill rig will be used during phases 3, 5 and 7 of the prospecting activities.

Alternatives considered:-

There are no alternatives to these types of drill rigs that will ensure high quality samples for analysis.

**(e) The operational aspects of the activity:**

Xhariep aims to minimize its impact on the natural environment as much as possible and as such has opted to only use drilling as an invasive prospecting method.

Alternatives considered:-

Xhariep considered conducting bulk sampling as part of its prospecting activities. To ensure the prospecting activities are cost effective, Xhariep opted to only conduct drilling activities during its initial prospecting period.

**(f) The option of not implementing the activity:**

Five measures of economic impacts can be used to demonstrate the potential effect of the proposed prospecting operation on the local economy:

- Employment - The extent of employment can be measured as number of jobs or in terms of full time equivalents.
- Payroll income - The gross remuneration of employees in terms of salaries and wages.
- Capital Expenditure (CAPEX) - The total amount spent on the purchasing of fixed assets and total spent on construction.
- Operating expenditure and maintenance (OPEX) - The total amount spent locally by businesses on goods and services, excluding salaries and wages as well as rents or interest.
- Revenue - The total value of sales arising from business activity at the prospecting operation.

The abovementioned positive impacts will be lost if the proposed prospecting project is not developed.

**(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 following interested and / or affected parties were identified:

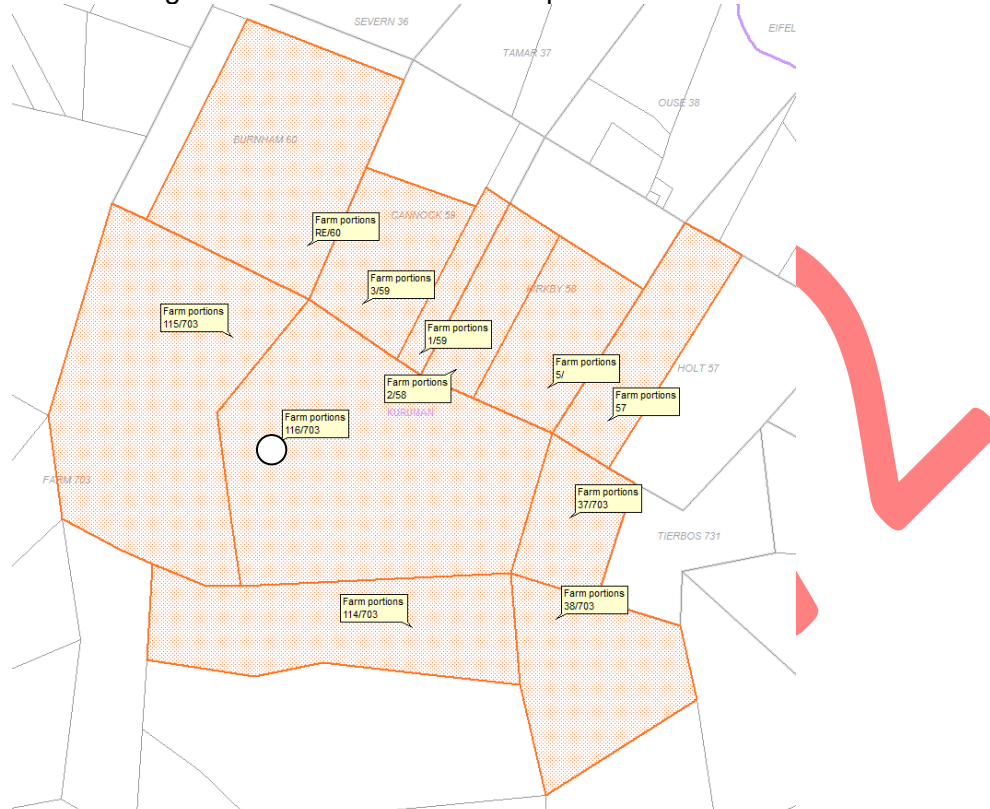


Figure 3a – Properties under application ( ○ ) and immediately adjacent properties

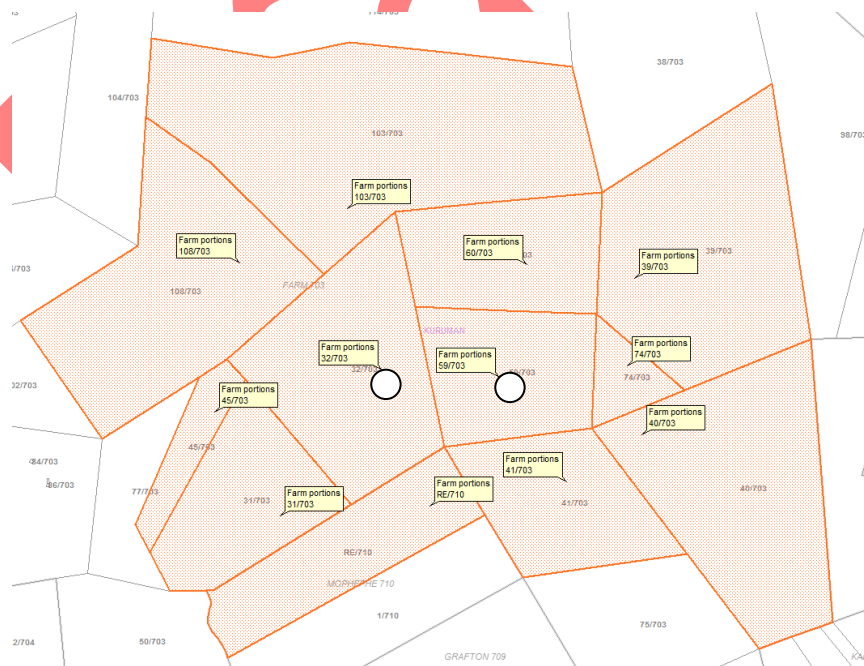


Figure 3b – Properties under application ( ○ ) and immediately adjacent properties

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Property description - Surface Owner	Owner
Portion 32 of the Farm 703	Hendrik Stephanus du Plessis
Remaining Extent of Portion 59 of the Farm 703	Welkom Boerdery Trust
Portion 116 of the Farm 703	Louis Hauman
Property description - Surrounding Owner	
Remaining Extent of the Farm Holt 57	Schalk Willem Burger
Remaining Extent of the Farm Kirkby 58	Schalk Willem Burger
Portion 2 of the Farm Kirkby 58	Schalk Willem Burger
Remaining Extent of the Farm Burnham 60	Saltrim Ranches (Pty) Ltd
Portion 31 of the Farm 703	Olivier Business Trust
Remaining Extent of Portion 37 of the Farm 703	Barneveld Trust
Portion 38 of the Farm 703	Rooidam Trust
Remaining Extent of Portion 39 of the Farm 703	Rooidam Trust
Portion 40 of the Farm 703	Karlsruhe Trust
Remaining Extent of Portion 41 of the Farm 703	Welkom Boerdery Trust
Remaining Extent of Portion 45 of the Farm 703	Olivier Business Trust
Portion 60 of the Farm 703	Johannes Lodewikus van der Walt Marilette van der Walt
Portion 74 (a Portion of Portion 39) of the Farm 703	Johannes Lodewikus van der Walt Marilette van der Walt
Remaining Extent of Portion 103 of the Farm 703	GC Olivier Boerdery (Pty) Ltd
Portion 108 (Tevrede) of the Farm 703	Fransonette du Plessis
Portion 114 (a Portion of Portion 107) of the Farm 703	Aquila Steel (South Africa) (Pty) Ltd
Portion 115 of the Farm 703	Vlakwater Trust
Farm Mophephe 710	Roelof Jacobus Willem du Plooy Trust
Interested / Affected Party	
Joe Morolong Local Municipality	
Mayor: Joe Morolong Local Municipality	
John Taolo Gaetsewe District Municipality	
Department: Agriculture, Environmental Affairs, Rural Development and Land Reform	
Department: Roads and Public Works	
Department: Water and Sanitation	
SAHRA	
Agri Kuruman	

**Notification:**

Identified interested and/or affected parties were notified of the proposed activity as follows (Refer to Appendix '5'):

- Notification letters were sent to all identified interested and / or affected parties (either by registered mail or by e-mail) on the 23<sup>rd</sup> of September 2022. Attached to each of these letters was a Background Information Document, containing information relating to the proposed project.
- A newspaper advert was placed in the 'Kathu Gazette' local newspaper on the 1<sup>st</sup> of October 2022.
- A notice was placed at the DMRE.
- A notice board has been placed at the entrance of the site.

**Responses:**

Responses have been received from the following IAPs. The responses are summarized in the table below. (Refer to Appendix '6'):

- Welkom Boerdery Trust (Mr. J.A. de Klerk)
- Mr. L. Hauman
- SAHRA
- Mr. P. Grove (Severn Boerevereniging)

Meetings:

A meeting was held on the 16<sup>th</sup> of November 2022 with the surface owners and other interested and/or affected parties.

The following was discussed in this meeting:

- Access control (security) is very important.
- Concerns:
  - Gates left open;
  - Damages to fences;
  - Disruption of general farming activities;
  - Fire hazard (veld fires); and
  - Problems experienced with previous prospecting operations.
  - Water depletion / drying up of boreholes.
- Geologist has to conduct work in accordance with surface use agreement.
- Rehabilitation of disturbed areas to ensure farming activities can continue after prospecting has been completed.
- Responsibility of Xhariep for latent issues that may arise from prospecting activities.
- Progress reports must be provided to surface owners.
- Surface Use Agreement must be entered into.
- Water:
  - Monitoring of groundwater quality and levels a requirement.
  - Different options of where Xhariep may be able to obtain water must be included in the final BAR.

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(iii) Summary of issues raised by I&AP's

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

Interested and Affected Parties List the names of persons consulted in this column, and mark with an X where those who must be consulted were in fact consulted.		Date comments received	Issues raised	EAPs response to the issue of the I&AP
<b>AFFECTED PARTIES</b>				
Landowner/s	X			
Mr. H.S. du Plessis	X	16/11/2022	A meeting was held on the 16 <sup>th</sup> of November 2022 with the surface owners and other interested and/or affected parties.	Refer to the Minutes of the Meeting and Attendance Register appended as Appendix '7'.
Welkom Boerdery Trust	X	12/10/2022	Mr. de Klerk sent, per e-mail, the completed 'Registration- and Comment Form'.	M&S responded, per e-mail, on the 13 <sup>th</sup> of October 2022 confirming that Welkom Boerdery Trust has been registered as an IAP and that a meeting will be held to discuss Xhariep's proposed prospecting activities.
		16/11/2022	A meeting was held on the 16 <sup>th</sup> of November 2022 with the surface owners and other interested and/or affected parties.	Refer to the Minutes of the Meeting and Attendance Register appended as Appendix '7'.
Mr. L. Hauman	X	27/10/2022	Mr. Hauman sent, per e-mail, the completed 'Registration- and Comment Form'. The following concerns were raised: <ul style="list-style-type: none"> <li>- The environment.</li> <li>- The water on the farm.</li> <li>- The safety of Mr. Hauman and his people.</li> <li>- Access control.</li> <li>- The safety of Mr. Hauman's animals.</li> <li>- The effect equipment might have on the roads.</li> <li>- Mr. Hauman's water pipelines.</li> <li>- Electricity network.</li> </ul>	M&S responded, per e-mail, on the 1 <sup>st</sup> of November 2022 confirming that Mr. Hauman has been registered as an IAP and that a meeting will be held to discuss the concerns raised in the 'Registration- and Comment Form'.

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		16/11/2022	A meeting was held on the 16 <sup>th</sup> of November 2022 with the surface owners and other interested and/or affected parties.	Refer to the Minutes of the Meeting and Attendance Register appended as Appendix '7'.
Lawful occupier/s of the land				
The surface owners occupy the land.				
Landowners or lawful occupiers on adjacent properties	X			
Mr. S.W. Burger	X	16/11/2022	A meeting was held on the 16 <sup>th</sup> of November 2022 with the surface owners and other interested and/or affected parties.	Refer to the Minutes of the Meeting and Attendance Register appended as Appendix '7'.
Saltrim Ranches (Pty) Ltd	X	N/A	No response has been received to date.	No response has been received to date.
Olivier Business Trust	X	N/A	No response has been received to date.	No response has been received to date.
Barneveld Trust	X	N/A	No response has been received to date.	No response has been received to date.
Roodam Trust		N/A	No contact details could be obtained through SearchWorks or the Master of the High Court.	N/A
Karlsruhe Trust		N/A	No contact details could be obtained through SearchWorks or the Master of the High Court.	N/A
Mr. J.L. van der Walt Ms. M. van der Walt	X	N/A	No response has been received to date.	No response has been received to date.
GC Olivier Boerdery (Pty) Ltd	X	N/A	No response has been received to date.	No response has been received to date.
Ms. F. du Plessis		N/A	No contact details could be obtained through SearchWorks.	N/A
Aquila Steel (South Africa) (Pty) Ltd	X	N/A	No response has been received to date.	No response has been received to date.
Vlakwater Trust	X	N/A	No response has been received to date.	No response has been received to date.
Roelof Jacobus Willem du Plooy Trust		N/A	No contact details could be obtained through SearchWorks or the Master of the	N/A

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			High Court.	
Municipal Councillor	X			
Mayor: Masara Maneng Joe Morolong Local Municipality	X	N/A	No response has been received to date.	No response has been received to date.
Municipality	X			
Joe Morolong Local Municipality	X	N/A	No response has been received to date.	No response has been received to date.
John Taolo Gaetsewe District Municipality	X	N/A	No response has been received to date.	No response has been received to date.
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA, etc.)				
Department: Roads and Public Works	X	N/A	No response has been received to date.	No response has been received to date.
Department: Water and Sanitation	X	N/A	No response has been received to date.	No response has been received to date.
Communities				
There are no known communities within the immediate vicinity of the application area.				
Department of Land Affairs				
Department: Agriculture, Environmental Affairs, Rural Development and Land Reform	X	N/A	No response has been received to date.	No response has been received to date.
Traditional Leaders				
There are no known communities within the immediate vicinity of the application area.				
Department of Environmental Affairs				
Department: Agriculture, Environmental Affairs, Rural Development and Land Reform	X	N/A	No response has been received to date.	No response has been received to date.
Other Competent Authorities				
None identified				
Other Interested and / or Affected Parties				
SAHRA	X	21/10/2022	Ms. N. Higgitt provided an 'Interim Comment': "The assessment must include an assessment of the impact to archaeological	Pulafel 4D Consulting has been appointed to conduct a Heritage Impact Assessment and a Palaeontological Impact



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			<p>and palaeontological resources. The field-based assessment of archaeological resources must be conducted by a qualified archaeologist.”</p> <p>“The proposed development is located within an area of moderate Palaeontological Sensitivity.” “As such, a desktop Palaeontological Impact Assessment must be undertaken by a qualified palaeontologist.”</p>	Assessment. The findings of these reports have been incorporated into this BAR/EMPr.
Agri Kuruman	X	15/11/2022	Mr. E. Anthonissen sent an e-mail stating he will be unable to attend the meeting. Request a copy of the Minutes of the Meeting.	M&S sent a copy of the Minutes of the Meeting to Mr. Anthonissen on the 21 <sup>st</sup> of November 2022.
Severn Boerevereniging	X	08/11/2022	Mr. P. Grove sent an e-mail requesting to be registered as an interested and/or affected party.	M&S responded, per e-mail, on the 8 <sup>th</sup> of November 2022 confirming that he has been registered.
		16/11/2022	A meeting was held on the 16 <sup>th</sup> of November 2022 with the surface owners and other interested and/or affected parties.	Refer to the Minutes of the Meeting and Attendance Register appended as Appendix ‘7’.

The consultation process was recorded until ....

- (iv) **The Environmental attributes associated with the 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.)

- **Air quality:**

The only current source of nuisance dust is created from vehicles travelling on the gravel (farm) roads transecting the immediate surrounding area. The general air quality on the application area is expected to be good.

The wind rose for Hotazel (situated approximately 50km south-east of the application area) shows how many hours per year the wind blows from the indicated direction.

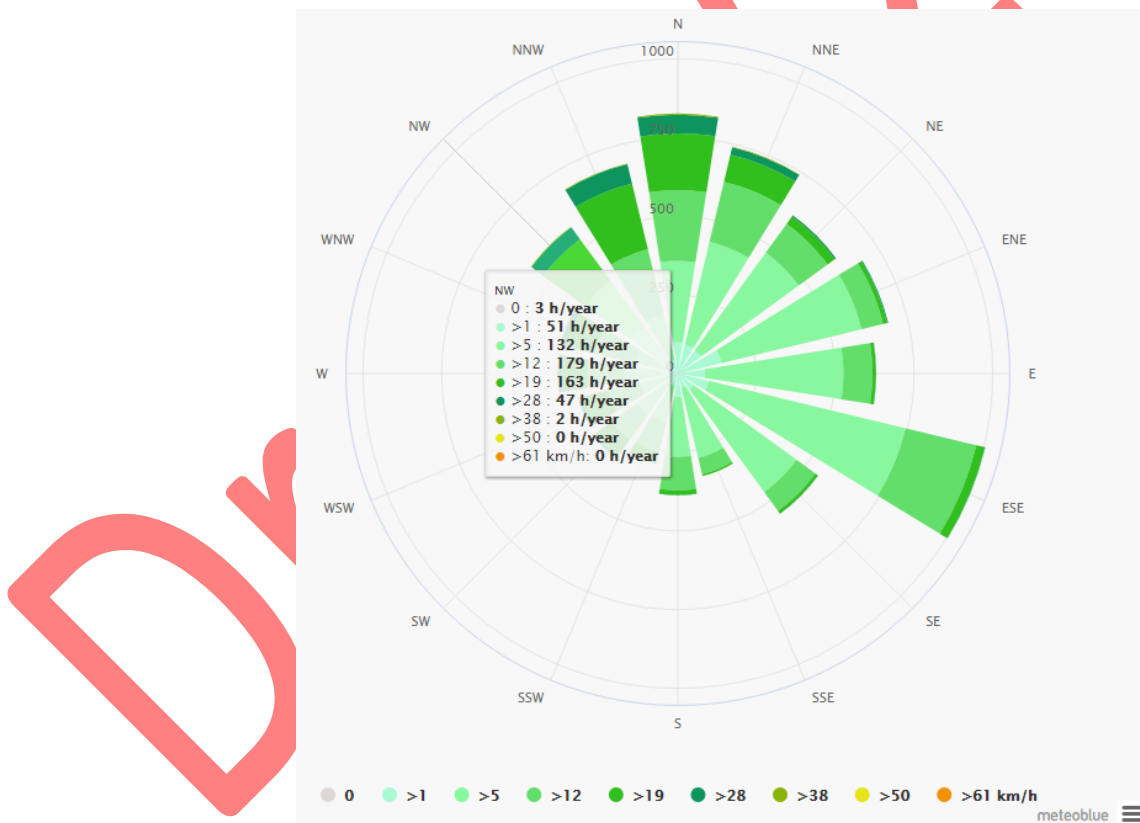


Figure 4 – Wind rose for Hotazel area

The diagram for Hotazel shows how many days within one month can be expected to reach certain wind speeds. Monsoons create steady strong winds from December to April, but calm winds from June to October.

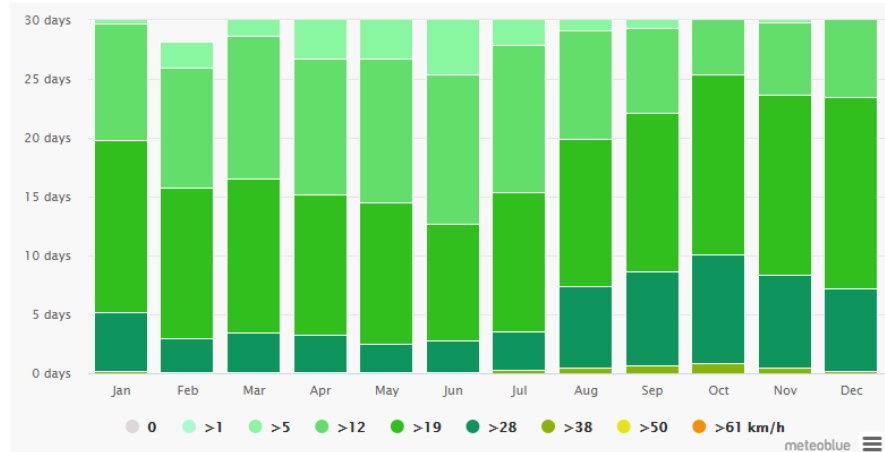


Figure 5 – Wind speed of the Hotazel area

• **Archaeological, cultural & heritage environment:**

Regulation 16(1)(v) of the Environmental Impact Assessment Regulations, 2014, as amended, requires that a proponent make use of the online 'National Environmental Screening Tool' to identify specific requirements, including specialist studies applicable to a proposed site based on the environmental sensitivity of the site.

M&S made use of this Screening Tool to determine the Archaeological, Cultural Heritage and Palaeontology sensitivities of the PR Area. Refer to Appendix '8' for copies of the Screening Reports.

Property	Archaeological and Cultural Heritage	Palaeontology
Portion 32 of the Farm 703	Low	Medium
Remaining Extent of Portion 59 of th Farm 703	Low	Medium
Portion 116 of the Farm 703	Low	Medium

Furthermore, the online Palaeosensitivity Map of South African Heritage Resources Agency (SAHRA) has been used to determine the palaeontological sensitivity of the application area. In terms of this map the sensitivity of the application area is rated as moderate and requires a desktop study.

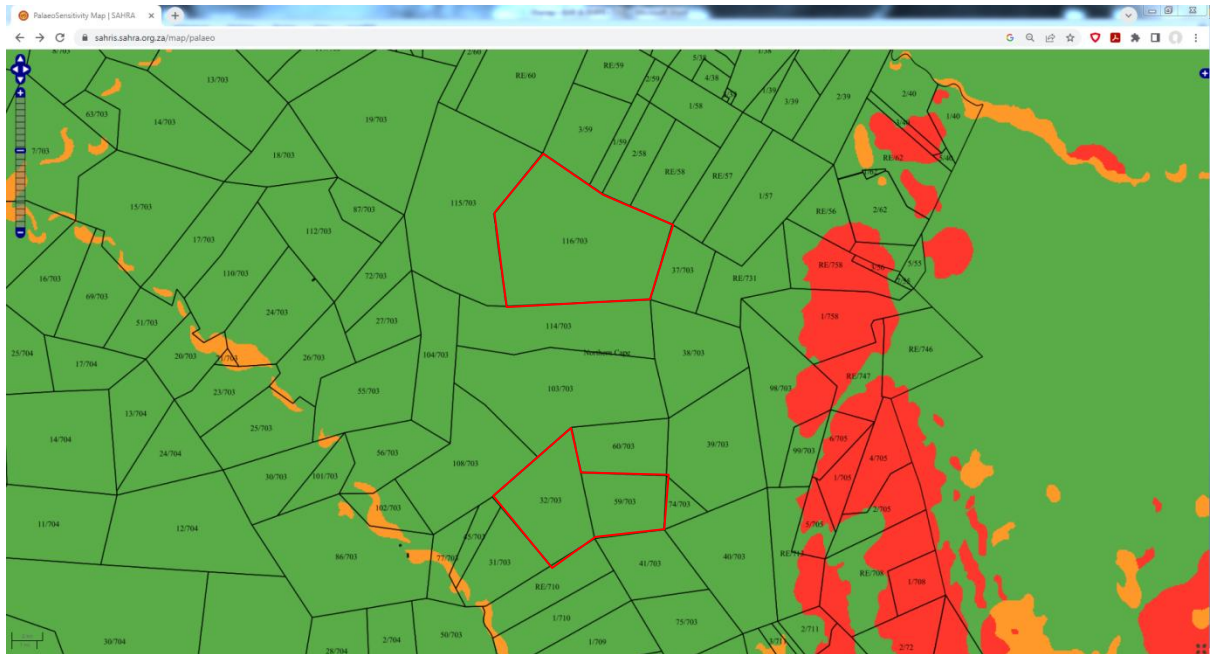


Figure 6 - Screenshot from online Palaeosensitivity Map showing prospecting right application area

**Fossil Sensitivity Map**

This map is available on the SAHRIS mapping system as a layer that can be switched on and off. The different colours on the map represent different levels of estimated palaeontological sensitivity.

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 7 - Legend of Palaeosensitivity Map

Pulafel 4D Consulting has been appointed to conduct a Heritage Impact Assessment and a Palaeontological Impact Assessment. The following is an abstract of the 'Conclusions and Recommendations' of these reports.

**Heritage Impact Assessment:**

No significant cultural material was found on the development footprint, except for historical structures (an old farmhouse and foundations) on Portion 116 of the Farm 703.

From the Desktop survey; no sites of archaeological, historical, or cultural importance are recorded for the area under study.

From the field survey; the recorded Stone Age material culture as heavily weathered and out of context and considered LOW.

In view of this, there are therefore, no heritage grounds to halt the prospecting activities.

**Palaeontological Impact Assessment:**

The study area was found to be basically devoid of any documented heritage sites. There is a strong likelihood that sites associated with the Stone Age could be found in this area. Mountainous areas could be home to rock art and Stone Age shelters.

The palaeontological significance of the site is moderate.

Due to the small footprint of the proposed prospecting activities, it is not anticipated that this will have any significant impact on heritage resources.

Taking into consideration the findings of the desktop study it is recommended that the plots identified for the prospect drilling be cleared for the proposed prospecting activities. It is further recommended that the Chance Finds Protocol found in the report be incorporated in the Prospecting Plan and that it be made available to the site agent or Environmental Control Officer.

- **Climate:**

The Northern Cape experiences typical semi-desert and desert climatic conditions. The summers are hot and dry and the winters cold and frosty.

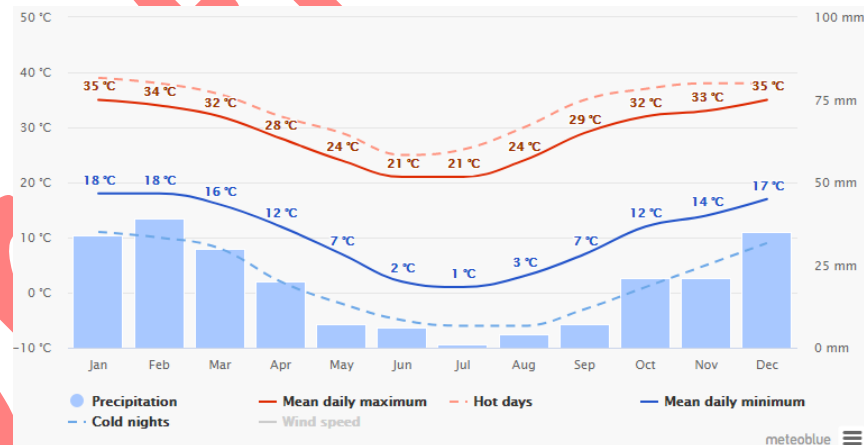


Figure 8 – Average temperatures and precipitation of the Hotazel area

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Hotazel. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

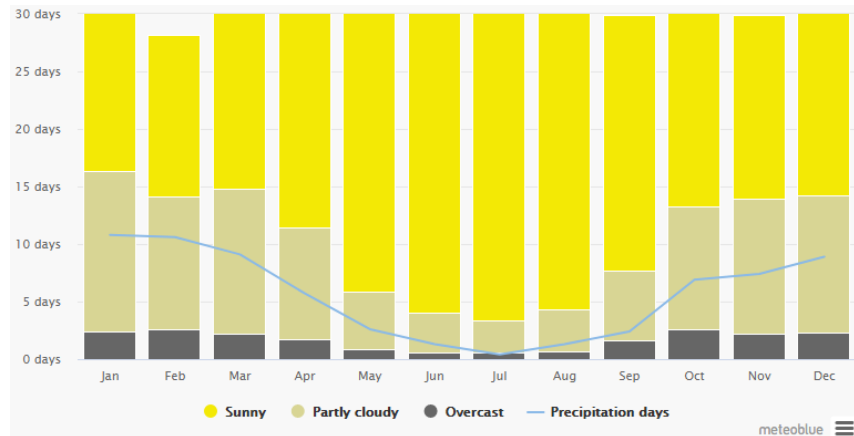


Figure 9 – Cloudy, sunny and precipitation days in the Hotazel area

The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

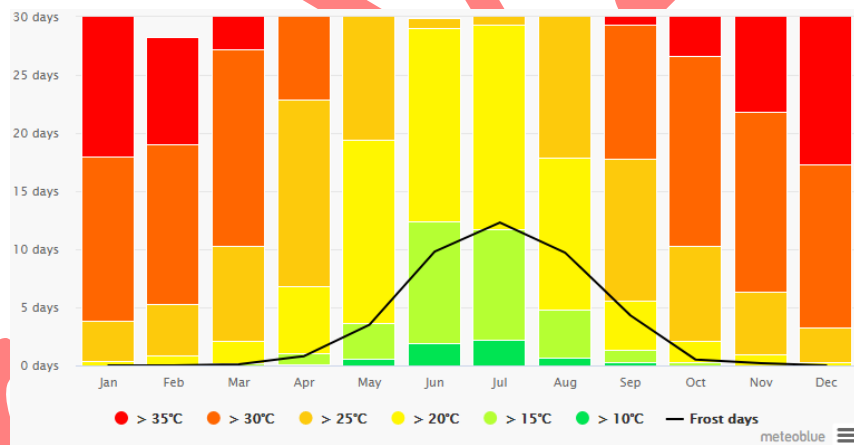


Figure 10 – Maximum temperatures in the Hotazel area

The maximum temperature diagram for Hotazel displays how many days per month reach certain temperatures.

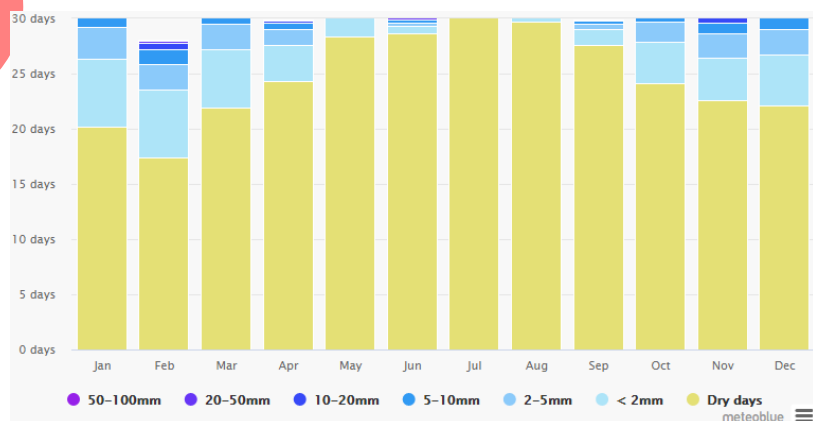


Figure 11 – Precipitation of the Hotazel area

The precipitation diagram for Hotazel shows on how many days per month, certain precipitation amounts are reached.

- **Fauna:**

Animals likely to be found on the farm and surrounding environment include small mammals and birds that are associated with the Molopo Bushveld and Kathu Bushveld vegetation types.

- **Flora:**

There are two broad vegetation types found within the area under application.

Molopo Bushveld Vegetation Type (SVk11):

Open woodland to a closed shrubland with the trees *Acacia erioloba* and *Boscia albitrunca* and shrubs *Lycium cinereum*, *L. hirsutum* and *Rhigozum trichotomum*. Grass layer is well developed in parts of the northeast, but usually fairly open.

The following is normally found under the vegetation type:

- Tall Tree: *Acacia erioloba* (d).
- Small Trees: *Boscia albitrunca* (d), *Terminalia sericea* (d), *Acacia mellifera* subsp. *detinens*.
- Tall Shrubs: *Lycium hirsutum* (d), *Rhigozum trichotomum* (d), *Grewia flava*, *Lycium villosum*, *Rhus burchellii*.
- Low Shrubs: *Acacia hebeclada* subsp. *hebeclada*, *Aptosimum albomarginatum*, *A. marlothii*, *Eriocephalus ericoides*, *Monechma divaricatum*, *M. incanum*.
- Geoxylic Suffrutex: *Elephantorrhiza elephantina*.
- Herbaceous Climber: *Momordica balsamina*.
- Graminoids: *Aristida meridionalis* (d), *A. stipitata* subsp. *spicata* (d), *Cenchrus ciliaris* (d), *Eragrostis lehmanniana* (d), *Aristida congesta*, *Eragrostis biflora*, *E. pallens*, *E. rigidior*, *Pogonarthria squarrosa*, *Schmidtia kalahariensis*, *S. pappophoroides*, *Stipagrostis ciliata*, *S. uniplumis*.
- Herbs: *Acanthosicyos naudinianus*, *Acrotome angustifolia*, *A. inflata*, *Dicoma schinzii*, *Geigeria ornativa*, *Helichrysum cerastioides*, *Hermannia tomentosa*, *Hermibstaedtia fleckii*, *H. linearis*, *Limeum arenicolum*, *L. fenestratum*, *L. viscosum*, *Lotononis platycarpa*, *Senna italica* subsp. *arachoides*, *Sericorema remotiflora*, *Tephrosia purpurea* subsp. *leptostachya*, *Tribulus terrestris*.

Conservation:

- Least threatened.
- Target 16%.
- Only 1% statutorily conserved in the Molopo Nature Reserve.
- More than 1% already transformed.
- Erosion is very low.

Kathu Bushveld Vegetation Type (SVk12):

Medium-tall tree layer with *Acacia erioloba* in places, but mostly open and including *Boscia albitrunca* as the prominent trees.

Shrub layer generally most important with, for example, *A. mellifera*, *Diospyros lycioides* and *Lycium hirsutum*. Grass layer is variable in cover.

The following is normally found under the vegetation type:

- Tall Tree: *Acacia erioloba* (d).
- Small Trees: *Acacia mellifera* subsp. *detinens* (d), *Bosica albitrunca* (d), *Terminalia sericea*.
- Tall Shrubs: *Diospyros lycioides* subsp. *lycioides* (d), *Dichrostachys cinerea*, *Grewia flava*, *Gymnosporia buxifolia*, *Rhigozum brevispinosum*.
- Low Shrubs: *Aptosimum decumbens*, *Grewia retinervis*, *Nolletia arenosa*, *Sida cordifolia*, *Tragia dioica*.
- Graminoids: *Aristida meridionalis* (d), *Brachiaria nigropedata* (d), *Centropodia glauca* (d), *Eragrostis lehmanniana* (d), *Schmidtia pappophoroides* (d), *Stipagrostis ciliata* (d), *Aristida congesta*, *Eragrostis biflora*, *E. chloromelas*, *E. heteromera*, *E. pallens*, *Melinis repens*, *Schmidtia kalahariensis*, *Stipagrostis uniplumis*, *Tragus berteronianus*.
- Herbs: *Acrotome inflata*, *Erlangea misera*, *Gisekia africana*, *Heliotropium ciliatum*, *Hermbsstaedtia fleckii*, *H. odorata*, *Limeum fenestratum*, *L. viscosum*, *Lotononis platycarpa*, *Senna italica* subsp. *arachoides*, *Tribulus terrestris*.

Conservation:

- Least threatened.
- Target 16%.
- None conserved in statutory conservation areas.
- More than 1% already transformed.
- Erosion is very low.

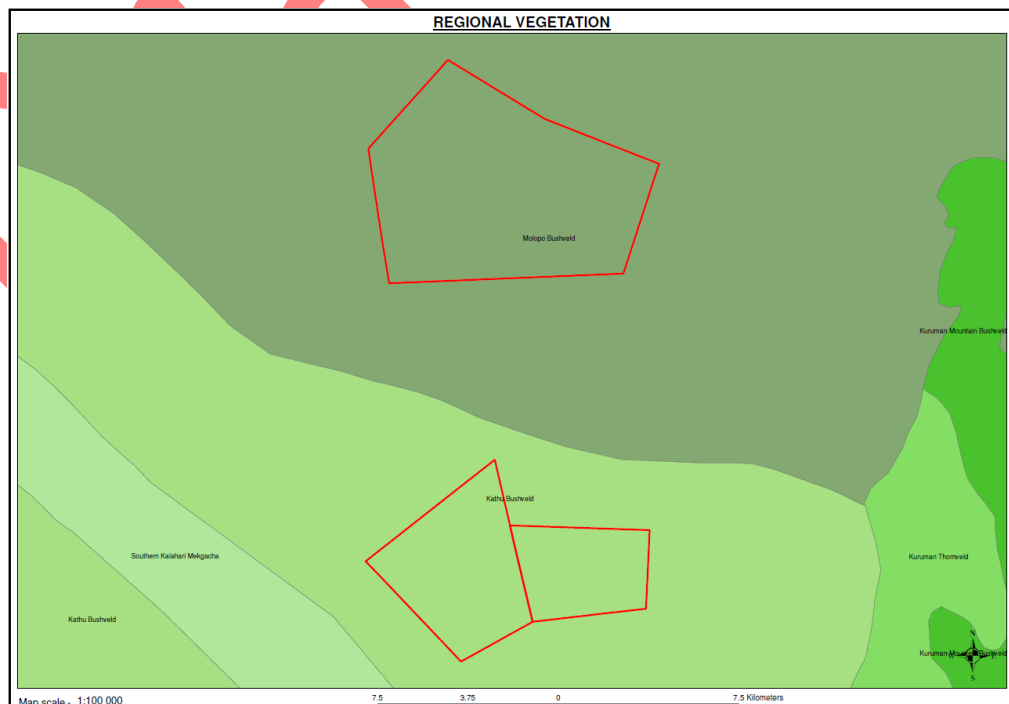


Figure 12 – Regional vegetation map



The total anticipated surface disturbance by Xhariep calculates to approximately 2.15 hectares. The total extent of the application area is 11 230.5057 hectares, thus calculating to a 0.019% surface disturbance by Xhariep. The anticipated impacts associated with the proposed prospecting operation are thus negligible and it is not foreseen that the economic livelihood of the surface owner/s from the livestock farming activities will be irreversibly damaged.

- **Geology:**

The 1:250,000 Geological Map 2622 describes the geology as follows:

- ❖ **Karoo System:**

The *Dwyka Series* which consists mainly of dark shale and tillite has a wide distribution beneath the Kalahari Beds in the west. The thickness is not known but 610m were penetrated in a borehole on Bristol without reaching the base of the succession. According to gravity measurements the total thickness may be about 660m west of Heuningvlei.

In the eastern area, south-east of Morokweng several outliers occur on the granite. According to borehole data the thickness on Pepani may exceed 300m. The outlier on the banded iron-stone on Woodrow is about 120m thick.

Dolerite sheets are intrusive into Dwyka strata on Moorcroft's Pan, De Dwaal, Uitkyk and Botley.

- ❖ **Transvaal System:**

The *Tillite Sub-stage of the Daspoort Stage* of the Pretoria Series lies unconformably on the jaspilite of the Banded Iron-stone Stage and crops out in the south, between Gamodisa and Pioneer and farther north in the Kgokgole River.

Rocks of this sub-stage have been struck in boreholes as far north as Exeter and are mainly tillite and with subordinate quartzite and conglomerate. The total thickness is about 90m in the south. The quartzite and conglomerate are nowhere more than 24m thick.

- ❖ **Waterberg System:**

The only outcrops of the *Lower Matsap Stage* are on Skimmel Koppies south of Severn and on Lover's Leap on the Molopo River. They consist of white and gray quartzite, reddish shale, interbedded lava bands and a basal conglomerate. The shale, lava and conglomerate are known only from boreholes and lie unconformably on the Daspoort Stage. The Stage was struck beneath shale of the Dwyka Series in boreholes as far north as Lester, north-west of Severn. The upper contact on the map is very approximate.

The *Lower Matsap Stage* is correlated with the clastic sediments (upper part) of the old Upper Griquatown Stage and those of the Loskop System. Later, in the Annals of the Geological Survey they were included in the Magaliesberg Series.

The *Upper Matsap Stage* does not crop out and is encountered only in boreholes in the south-eastern part of the area. It consists mainly of brown, purplish and gray quartzite.

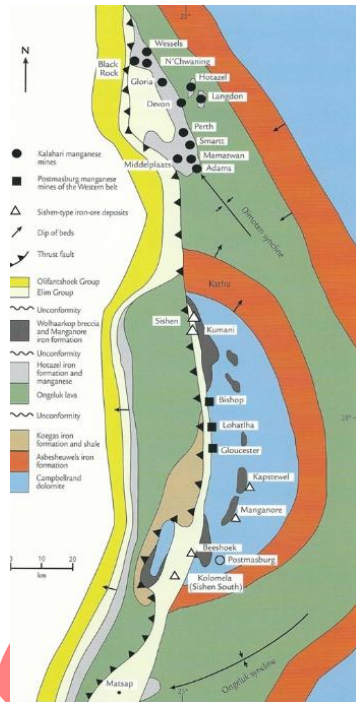


Figure 13a - Geological map



Figure 13b – Geological map

- **Groundwater:**

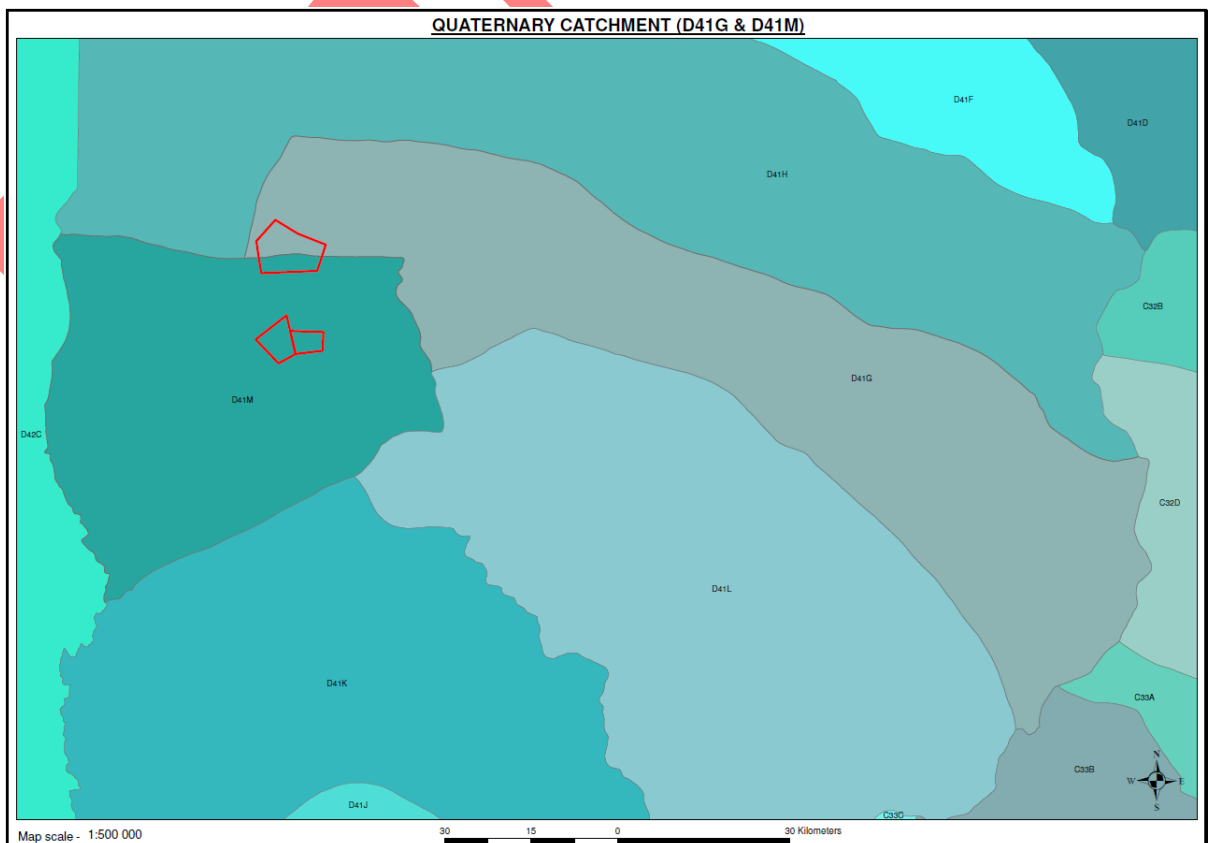


Figure 14 – Catchment map

The application area falls over the D41G and D41M quaternary drainage regions.

These drainage region forms part of the Lower Vaal Water Management Area (nr. 10 in terms of the National Water Act, 1998 (Act no. 36 of 1998) as published in the Government Gazette 20491, 1 October 1999).

The surface owners use groundwater for livestock and game watering and domestic purposes. The ground water quality is expected to be reasonable.

- **Noise:**  
The only current source of noise is created from vehicles travelling on the secondary roads and the gravel (farm) roads transecting the properties and immediate surrounding area.
- **Sensitive landscapes:**  
"Sensitive environments" that have statutory protection are the following:
  - Limited development areas (section 23 of the Environment Conservation Act, 1989 (Act 73 of 1989).
  - Protected natural environments and national heritage sites.
  - National, provincial, municipal and private nature reserves.
  - Conservation areas and sites of conservation significance.
  - National monuments and gardens of remembrance.
  - Archaeological and palaeontological sites.
  - Graves and burial sites
  - Lake areas, offshore islands and the admiralty reserve.
  - Estuaries, lagoons, wetlands and lakes.
  - Streams and river channels, and their banks.
  - Dunes and beaches.
  - Caves and sites of geological significance.
  - Battle and burial sites.
  - Habitat and/or breeding sites of Red Data Book species.
  - Areas or sites of outstanding natural beauty.
  - Areas or sites of special scientific interest.
  - Areas or sites of special social, cultural or historical interest.
  - Declared national heritage sites
  - Mountain catchment areas.
  - Areas with eco-tourism potential

The following sensitive environments have been identified within the PR Area:

→ Archaeological and palaeontological sites:

No significant cultural material was found on the development footprint, except for historical structures (an old farmhouse and foundations) on Portion 116 of the Farm 703. From the Desktop survey; no sites of archaeological, historical, or cultural importance are recorded for the area under study. From the field survey; the recorded Stone Age material culture as heavily weathered and out of context and considered LOW.

- Graves and burial sites:  
The field survey (conducted by Dr. J. Chikumbirike and Prof. J. Mataga) and oral interviews with farm owners in the study area did not find any visible or identifiable burial grounds nor graves.
- Streams and river channels, and their banks:  
There are a number of ephemeral pans within the application area.

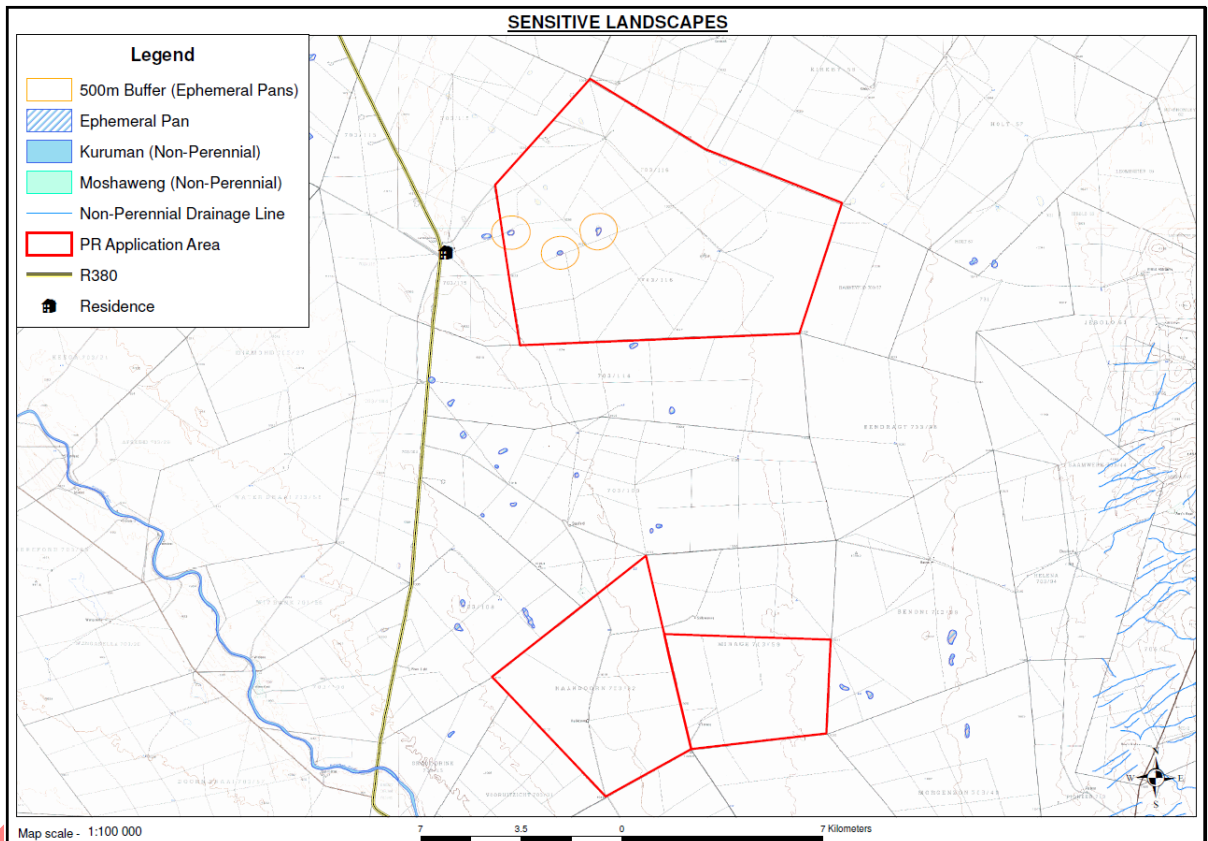


Figure 15 - Sensitive landscapes

- **Socio-Economic:**

Censuses were held in 2001, 2011 and 2022, whilst Community Surveys were held in 2007 and 2016 respectively.

The last census was held in 2022; however these results are not yet available. The following section was compiled using data from Census 2001 and 2011.

The farms under application fall within the Joe Morolong Local Municipality, which falls under management of the John Taolo Gaetsewe District Municipality. The municipal area is approximately 5 813 km<sup>2</sup> in size.

The Joe Morolong Local Municipality was established in 2000 and serves 15 wards, most of which are rural. Although unemployment is high, the municipality has great potential for

developers, especially those interested in ecotourism and conservation.

Key Statistics		2001	Key Statistics		2011
Total population	97,945		Total population	89,530	
Young (0-14)	41,9%		Young (0-14)	39,4%	
Working Age (15-64)	54,2%		Working Age (15-64)	54,2%	
Elderly (65+)	5,6%		Elderly (65+)	6,4%	
Dependency ratio	90,4%		Dependency ratio	84,6	
Sex ratio	89		Sex ratio	85,5	
Growth rate	-2,76% (2001-2011)		Growth rate	-0,9% (2001-2011)	
Unemployment rate	49%		Population density	4 persons/km2	
Youth unemployment rate	59,8%		Unemployment rate	38,6%	
No schooling aged 20+	31,6%		Youth unemployment rate	49,5%	
Higher education aged 20+	3,3%		No schooling aged 20+	22,8%	
Matric aged 20+	8,3%		Higher education aged 20+	4,1%	
Number of households	21,749		Matric aged 20+	13,4%	
Average household size	4,3		Number of households	23,707	
Female headed households	50,8%		Number of Agricultural households	11,494	
Formal dwellings	64,8%		Average household size	3,7	
Housing owned/paying off	84,3%		Female headed households	50,7%	
Flush toilet connected to sewerage	7,2%		Formal dwellings	72,5%	
Weekly refuse removal	5,8%		Housing owned/paying off	52,5%	
Piped water inside dwelling	6,1%		Flush toilet connected to sewerage	6%	
Electricity for lighting	39%		Weekly refuse removal	6,1%	
			Piped water inside dwelling	9,1%	
			Electricity for lighting	81,8%	

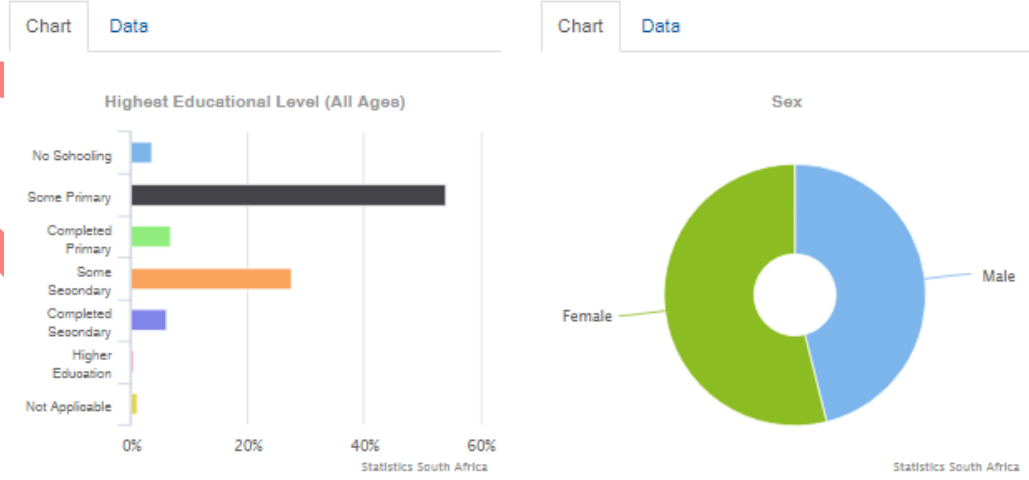
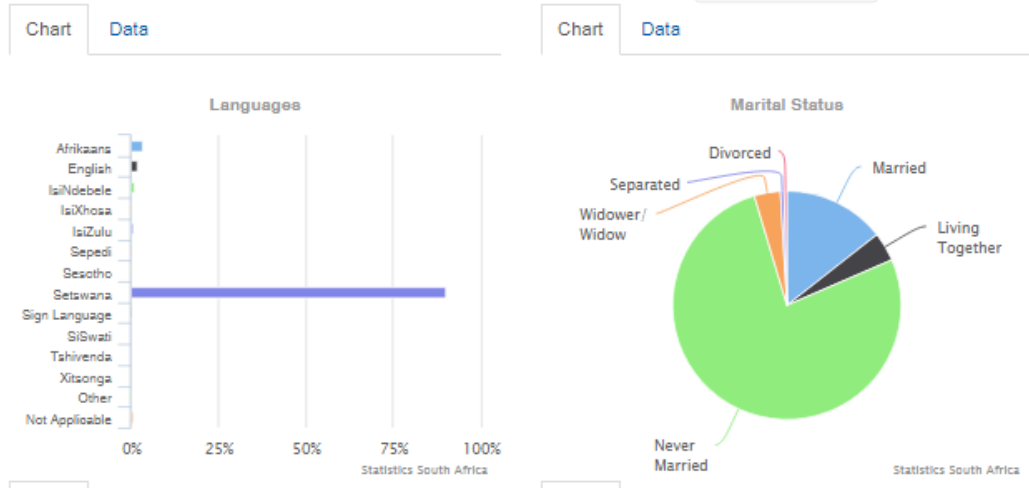
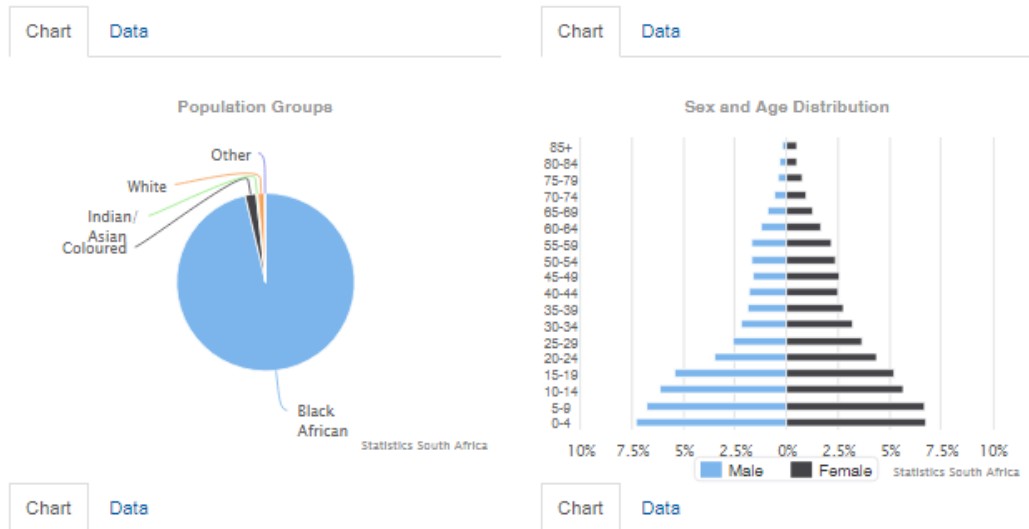


People:

According to the 2011 Census, Joe Morolong Local Municipality has a total population of 89 530 people. The majority of the population in the municipality are black African (96,4%), 2,0% are coloured, with the other population groups making up the remaining 1,6%.

Of those aged 20 years and older, 5,2% have completed primary school, 27,8% have some secondary education, 13,4% have

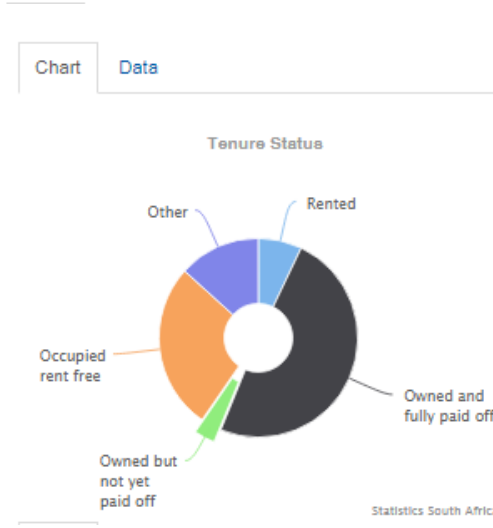
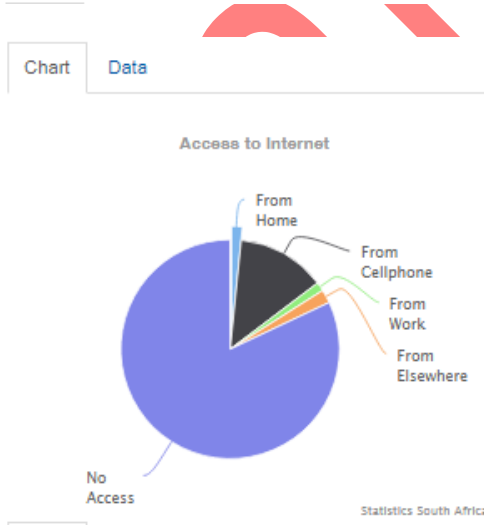
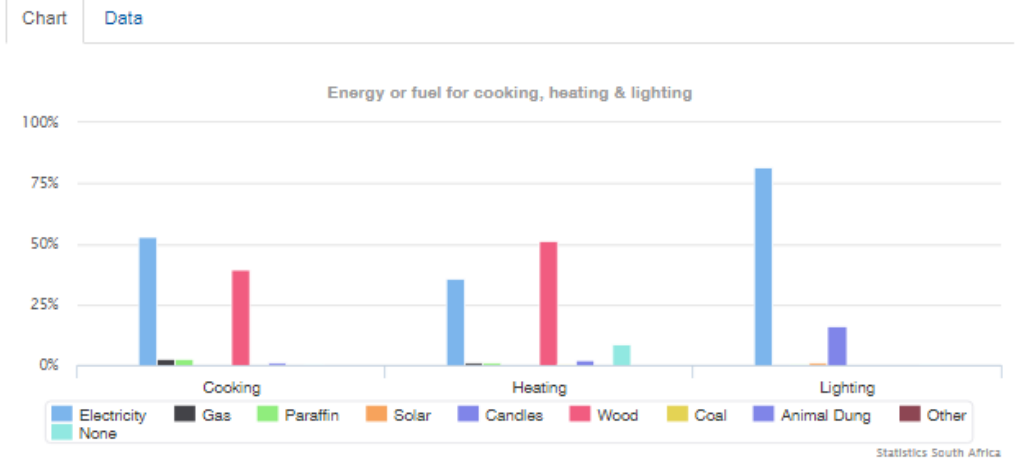
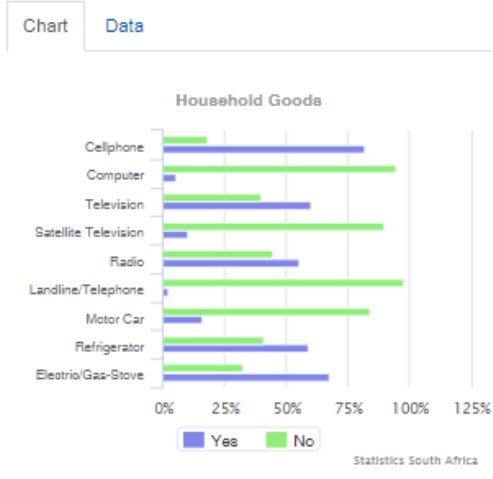
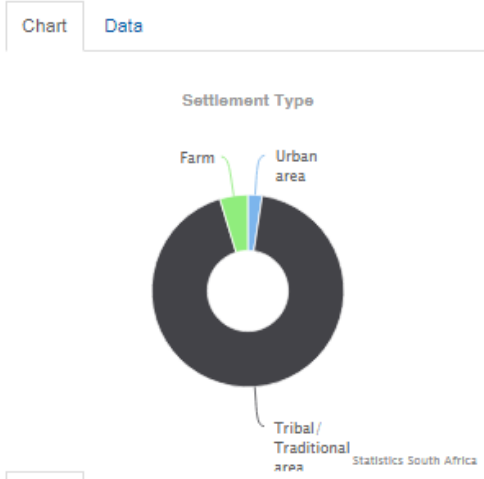
completed matric and 4,1% have some form of higher education. Of the mentioned age group, 22,9% have no form of schooling.



**Living conditions:**

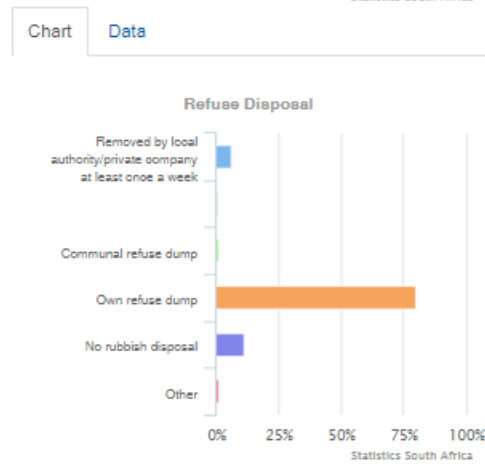
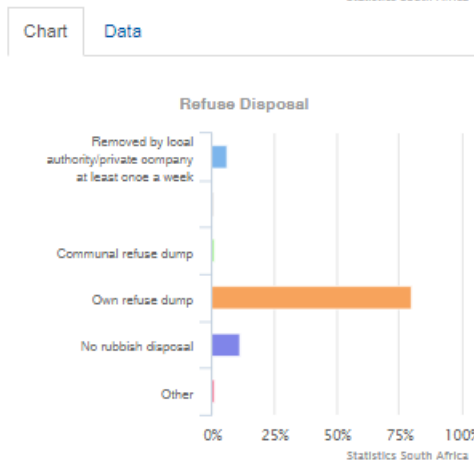
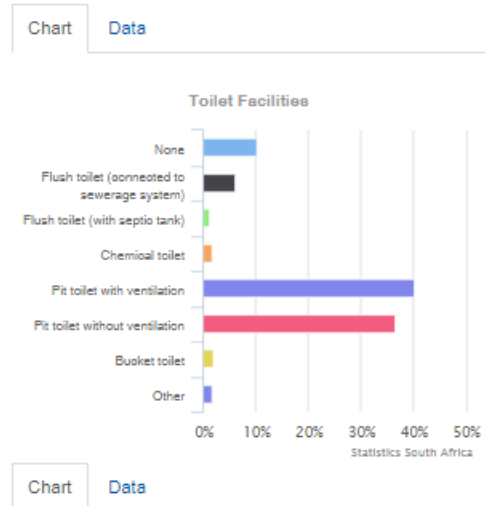
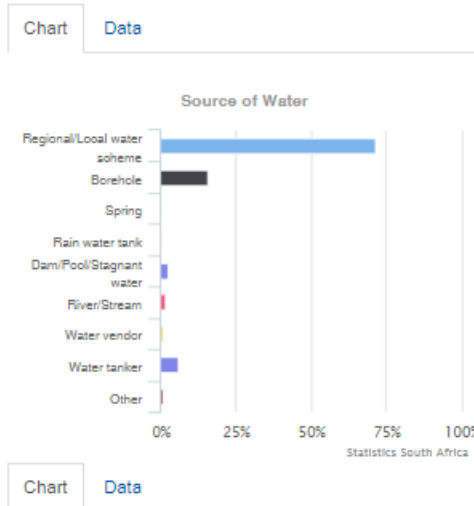
There are 23 707 households in the municipality, with an average household size of 3,4 persons per household. Of the households, 6,6% have access to piped water either in their dwelling or in the yard, while 81,8% of households have access to electricity for lighting.

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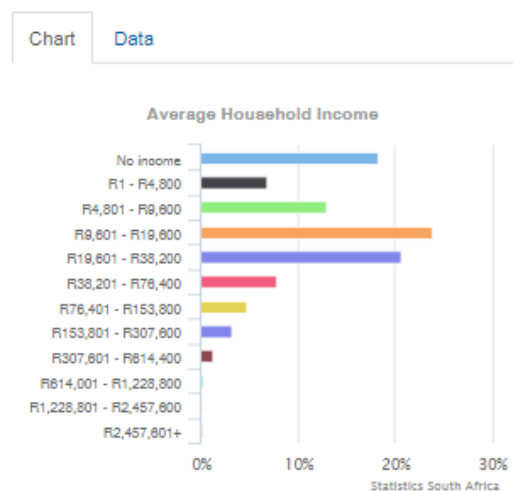
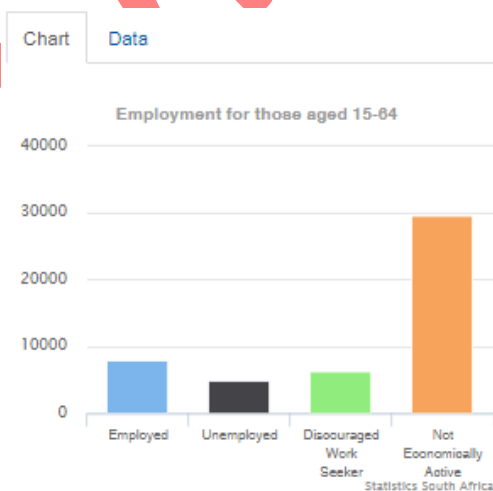
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Economy:

There are 12 740 people that are economically active (employed or unemployed but looking for work), and of these, 38,6% are unemployed.

Of the 6 323 economically active youth (15–34 years) in the area, 49,5% are unemployed.



- **Soil:**  
The soils of the application area are described per vegetation type:

The soils in the Molopo Bushveld vegetation type are described as red Aeolian sand of Recent age with surface calcrete and silcrete. Soils are deep (>1.2m) and sandy (Hutton and Clovelly soil forms). Land types are mainly Ah with a little Fc.

The soils in the Kathu Bushveld vegetation type are described as Aeolian red sand and surface calcrete, deep (>1.2m) sandy soils of Hutton and Clovelly soil forms. Land types are mainly Ah and Ae, with some Ag.

- **Surface water:**  
There are a number of ephemeral pans within the application area.

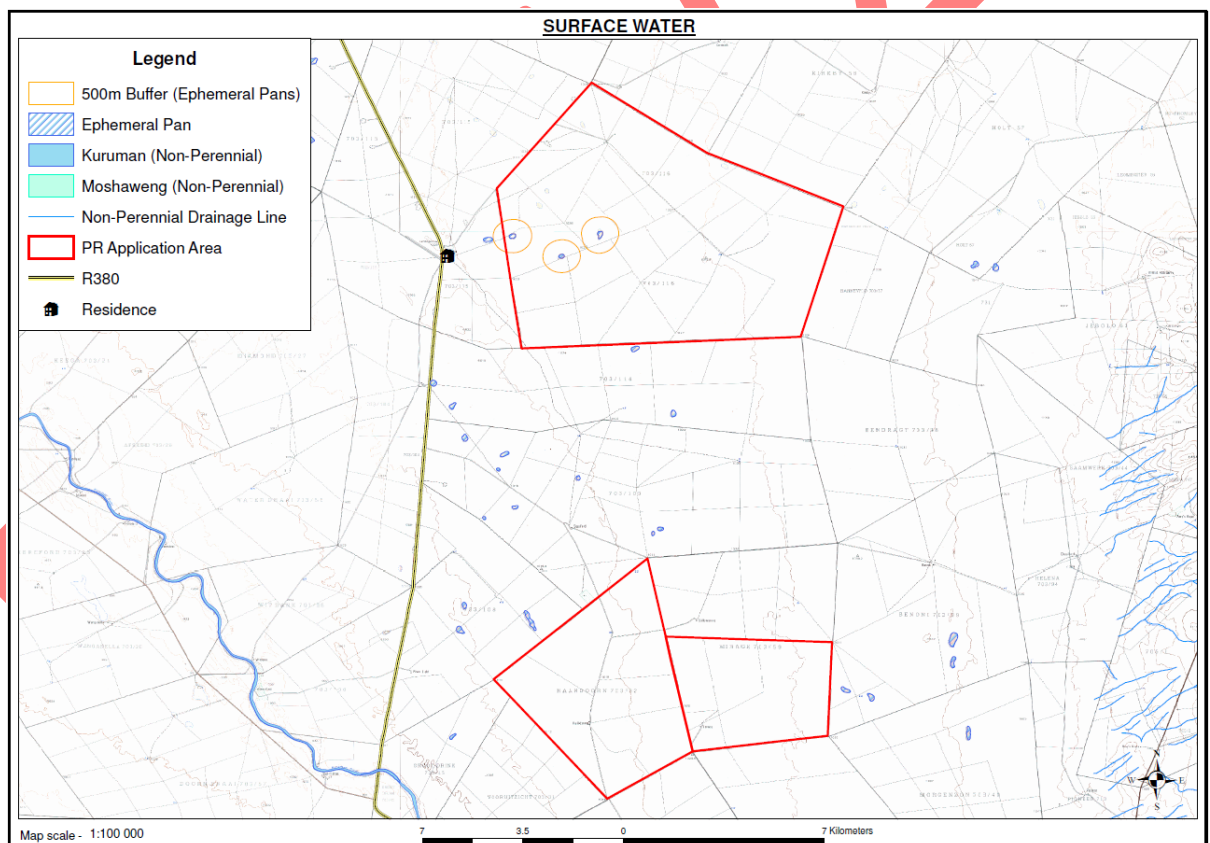


Figure 16 – Surface water map

- **Topography:**  
The application area's altitude varies between 1 017m and 1 040 meters above sea level.

The landscape features for the areas located within the Molopo Bushveld Vegetation type can be described as follows:  
Open woodland to a closed shrubland with the trees *Acacia erioloba* and *Boscia albitrunca* and shrubs *Lycium cinereum*, *L.*

*hirsutum* and *Rhigozum trichotomum*. Grass layer is well developed in parts of the northeast, but usually fairly open.

The landscape features for the areas located within the Kathu Bushveld Vegetation type can be described as follows:

Medium-tall tree layer with *Acacia erioloba* in places, but mostly open and including *Boscia albitrunca* as the prominent trees. Shrub layer generally most important with, for example, *A. mellifera*, *Diospyros lycioides* and *Lycium hirsutum*. Grass layer is variable in cover.

**(b) Description of the current land uses.**

The surface owners currently utilize the land under application for livestock / game farming purposes.

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

- Infrastructure:
  - The on-site gravel (farm) roads are in a reasonable condition.
  - The secondary gravel roads accessing the farms are in a reasonable condition.
  - There are only a few windmills and relating agricultural infrastructure within the area under application.
- Environmental:

There are a number of ephemeral pans within the application area.

**(d) Environmental and current land use map:**  
(Show all environmental and current land use features.)

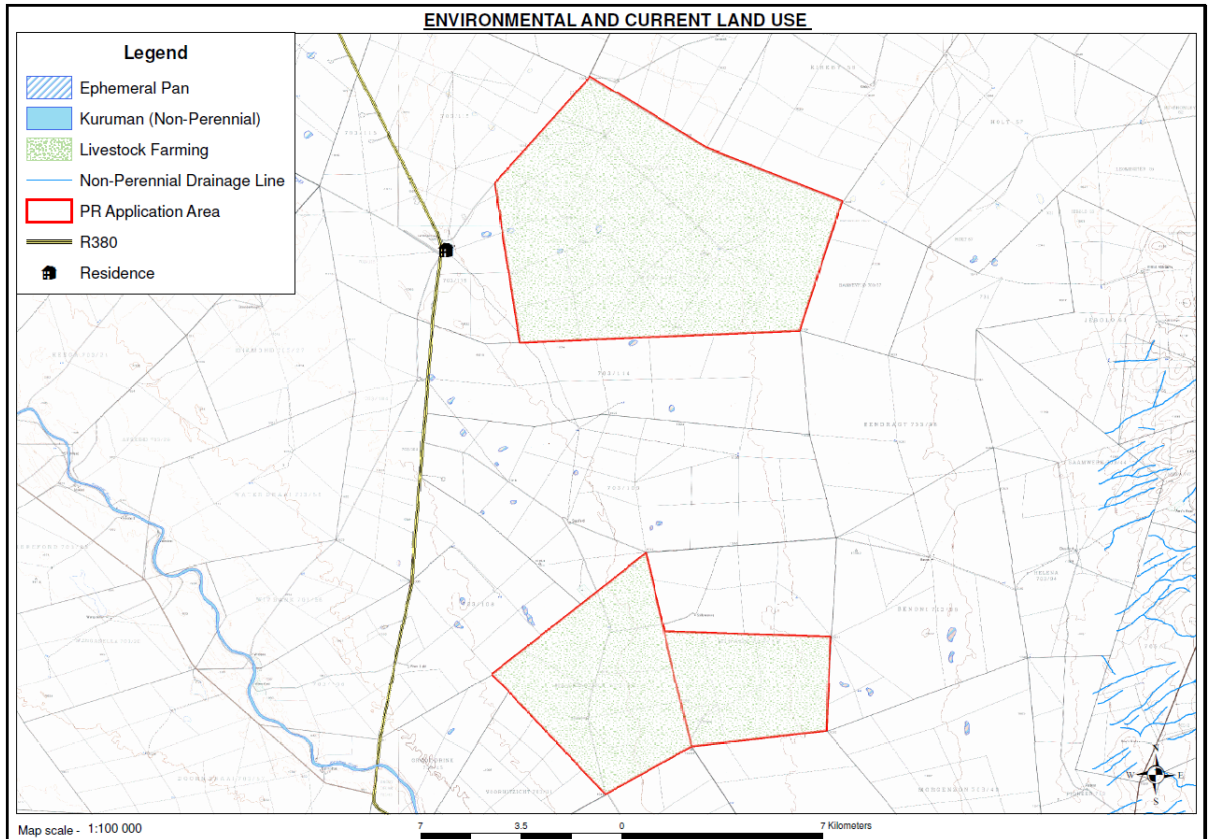


Figure 17 – Current land use and environmental map

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**(v) Impacts identified:**

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

Cumulative environmental impacts can be defined as changes to the environment caused by the combined impact of past, present and future human activities and/or natural processes.

Livestock Farming:

The properties under application for a Prospecting Right are currently used for grazing of livestock. The properties are divided into a number of 'camps' and the livestock are rotated between the camps. This provides rest periods for plants while others are being grazed. Impacts associated with farming activities include overgrazing, destruction of the natural vegetation cover and soil compaction through 'trampling' if the rotational grazing method is not implemented correctly by the surface owner/s and loss of groundwater if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained.

Prospecting:

The only invasive prospecting activity that will be conducted by Xhariep is drilling (percussion). Provision has been made for fifty boreholes (20 boreholes during first phase drilling; 15 boreholes during second phase drilling and 15 for the third phase drilling).

The site clearance for drill rigs will be kept to a minimum and provision is made for a 20m x 20m surface disturbance around each borehole. Existing roads and farm tracks shall be used as far as possible. Provision is made for 500m x 3m wide two-spoor access tracks for the drilling rig.

The total anticipated surface disturbance by Xhariep calculates to 2ha for the proposed boreholes and 0.15ha for the anticipated two-spoor access tracks. The total extent of the application area is 11 230.5057 hectares, thus calculating to a 0.019% surface disturbance by Xhariep. The anticipated impacts associated with the proposed prospecting operation are thus negligible and it is not foreseen that the economic livelihood of the surface owner/s from the livestock farming activities will be negatively affected.

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• **Air Quality:**

Activity	Extent	Duration	Intensity	Probability	Significance without mitigation
Drilling	Site	Short Term	Low	Definite	Low
Vehicle emissions	Local	Short Term	Low	Probable	No significance
Nuisance dust – roads	Site	Short Term	Low	Probable	Low
Nuisance dust – vegetation clearance	Local	Long Term	Low	Definite	Low
Smoke – domestic fires	Site	Short Term	Low	Improbable	No significance

Activity	Impact summary	Significance with mitigation
Air Quality	<p><i>Direct impacts:</i></p> <ul style="list-style-type: none"> <li>• Nuisance dust created by prospecting drilling.</li> <li>• Vehicle emissions from vehicles and equipment utilized by the prospecting operation.</li> <li>• Vehicle emissions from vehicles utilized by farming activities.</li> <li>• Nuisance dust from the farm roads and road network in the surrounding area.</li> </ul>	Negative: Very Low
	<p><i>Indirect impacts:</i></p> <ul style="list-style-type: none"> <li>• Nuisance dust created in areas where vegetation cover is cleared for drilling sites.</li> </ul>	Negative: Very Low
	<p><i>Cumulative impacts:</i></p> <ul style="list-style-type: none"> <li>• Nuisance dust created by prospecting drilling.</li> <li>• Vehicle emissions from vehicles and equipment utilized by the prospecting operation.</li> <li>• Vehicle emissions from vehicles utilized by farming activities.</li> <li>• Nuisance dust from the farm roads and road network in the surrounding area.</li> <li>• Nuisance dust created in areas where vegetation cover is cleared for drilling sites.</li> <li>• Smoke from domestic open fires.</li> </ul>	Negative Very Low

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• **Fauna:**

Activity	Extent	Duration	Intensity	Probability	Significance without mitigation
Disturbance of natural habitat – Drill sites	Local	Long Term	Medium	Probable	Medium
Disturbance of natural habitat - Overgrazing	Local	Long Term	Medium	Improbable	Medium

Activity	Impact summary	Significance with mitigation
Fauna	<i>Direct impacts:</i> <ul style="list-style-type: none"> <li>Disturbance of natural habitat of wild animals when vegetation is cleared for drilling sites.</li> <li>Disturbance of natural habitat of wild animals in the instance of overgrazing.</li> </ul>	Negative: Low
	<i>Indirect impacts:</i> <ul style="list-style-type: none"> <li>None</li> </ul>	N/A
	<i>Cumulative impacts:</i> <ul style="list-style-type: none"> <li>Disturbance of natural habitat of wild animals when vegetation is cleared for drilling sites.</li> <li>Disturbance of natural habitat of wild animals in the instance of overgrazing.</li> </ul>	Negative: Low

• **Flora:**

Activity	Extent	Duration	Intensity	Probability	Significance without mitigation
Disturbance of natural vegetation cover – Drill sites	Local	Long Term	Medium	Definite	Medium
Disturbance of natural vegetation cover - Overgrazing	Local	Long Term	Medium	Improbable	Medium
Veld fires	Regional	Medium Term	High	Probable	High

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Activity	Impact summary	Significance with mitigation
Flora	<i>Direct impacts:</i> <ul style="list-style-type: none"> <li>Disturbance and/or destruction of natural vegetation cover when vegetation is cleared for drilling sites.</li> <li>Disturbance and/or destruction of natural vegetation cover in the instance of overgrazing.</li> </ul>	Negative: Low
	<i>Indirect impacts:</i> <ul style="list-style-type: none"> <li>Disturbance of natural habitat of wild animals when vegetation is cleared for drilling sites.</li> <li>Disturbance of natural habitat of wild animals in the instance of overgrazing.</li> </ul>	Negative: Low
	<i>Cumulative impacts:</i> <ul style="list-style-type: none"> <li>Disturbance and/or destruction of natural vegetation cover when vegetation is cleared for drilling sites.</li> <li>Disturbance and/or destruction of natural vegetation cover in the instance of overgrazing.</li> <li>Disturbance of natural habitat of wild animals when vegetation is cleared for drilling sites.</li> <li>Disturbance of natural habitat of wild animals in the instance of overgrazing.</li> <li>Veld fires.</li> </ul>	Negative: Low

• **Groundwater:**

Activity	Extent	Duration	Intensity	Probability	Significance without mitigation
Groundwater loss – Prospecting Activities	Site	Medium Term	Medium	Improbable	Low
Groundwater loss – Farming Activities	Site	Short Term	Medium	Improbable	Low
Groundwater contamination	Site	Medium Term	Low	Probable	Low

Activity	Impact summary	Significance with mitigation
Groundwater	<i>Direct impacts:</i> <ul style="list-style-type: none"> <li>Utilization of groundwater for drilling could cause a drop in the groundwater table.</li> <li>Loss of groundwater if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained by the surface owner/s.</li> </ul>	Negative: Very Low



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	<p><i>Indirect impacts:</i></p> <ul style="list-style-type: none"> <li>Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites, which could contaminate the groundwater.</li> </ul>	Negative: Very Low
	<p><i>Cumulative impacts:</i></p> <ul style="list-style-type: none"> <li>Utilization of groundwater for drilling could cause a temporary drop in the groundwater table.</li> <li>Loss of groundwater if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained by the surface owner/s.</li> <li>Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites, which could contaminate the groundwater.</li> <li>Possible chemical spills from chemical toilets utilized by the prospecting operation, which could contaminate the groundwater.</li> </ul>	Negative: Very Low

• **Noise:**

Activity	Extent	Duration	Intensity	Probability	Significance without mitigation
Drill rigs	Site	Short Term	Low	Definite	Low
Prospecting vehicles and equipment	Site	Short Term	Low	Probable	No significance
Farming vehicles	Site	Short Term	Low	Probable	No significance

Activity	Impact summary	Significance with mitigation
Noise	<p><i>Direct impacts:</i></p> <ul style="list-style-type: none"> <li>Noise from drilling rigs.</li> <li>Noise from prospecting vehicles and equipment.</li> </ul>	Negative: Very Low
	<p><i>Indirect impacts:</i></p> <ul style="list-style-type: none"> <li>None</li> </ul>	N/A
	<p><i>Cumulative impacts:</i></p> <ul style="list-style-type: none"> <li>Noise from drilling rigs.</li> <li>Noise from prospecting vehicles and equipment.</li> <li>Noise from farming vehicles.</li> </ul>	Negative: Very Low

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• **Soil:**

Activity	Extent	Duration	Intensity	Probability	Significance without mitigation
Disturbance of soil structure	Local	Short Term	Low	Probable	Low
Hydrocarbon spills	Local	Short Term	Low	Probable	Low
Erosion	Site	Short Term	Low	Improbable	No significance
Soil compaction – Drilling	Local	Short Term	Low	Probable	Low
Soil compaction – Overgrazing	Local	Short Term	Low	Improbable	No significance
Spills from chemical toilet	Local	Short Term	Low	Improbable	No significance

Activity	Impact summary	Significance with mitigation
Soil	<p><i>Direct impacts:</i></p> <ul style="list-style-type: none"> <li>Disturbance of the soil structure during drilling activities.</li> <li>Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites.</li> <li>Erosion in areas where vegetation has been cleared at the drilling sites.</li> </ul>	Negative: Very Low
	<p><i>Indirect impacts:</i></p> <ul style="list-style-type: none"> <li>Compaction of soil during drilling activities.</li> <li>Compaction of soil in the event of overgrazing.</li> </ul>	Negative: Very Low
	<p><i>Cumulative impacts:</i></p> <ul style="list-style-type: none"> <li>Disturbance of the soil structure during drilling activities.</li> <li>Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites.</li> <li>Potential hydrocarbon spills on the surrounding road network.</li> <li>Erosion in areas where vegetation has been cleared at the drilling sites.</li> <li>Possible chemical spills from chemical toilets utilized by the prospecting operation.</li> <li>Compaction of soil during drilling activities.</li> <li>Compaction of soil in the event of overgrazing.</li> </ul>	Negative: Very Low

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• **Surface water:**

Activity	Extent	Duration	Intensity	Probability	Significance without mitigation
Hydrocarbon spills	Site	Short Term	Low	Improbable	No significance

Activity	Impact summary	Significance
Surface water	<i>Direct impacts:</i> • None anticipated if buffer zones around ephemeral pans are adhered to.	N/A
	<i>Indirect impacts:</i> • Hydrocarbon spills could potentially flow into ephemeral pans during rain events.	Negative: Very Low
	<i>Cumulative impacts:</i> • Hydrocarbon spills could potentially flow into ephemeral pans during rain events.	Negative: Very Low

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(vi) **Methodology used in determining the significance of environmental impacts:**

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

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

**Nature of impact**

This is an appraisal of the type of effect the activity would have on the affected environmental component. Its description should include what is being affected, and how.

**Extent**

The physical and spatial size of the impact. This is classified as follows:

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

**Duration**

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

- **Short term**  
The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term**  
The impact will last up to the end of the mining period, where after it will be entirely negated.
- **Long term**  
The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**  
The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

**Intensity**

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

- **Low**  
This alters the affected environment in such a way that the natural processes or functions are not affected.
- **Medium**  
The affected environment is altered, but function and process continue, albeit in a modified way.

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

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

### **Probability**

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

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

### **Determination of significance**

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The classes are rated as follows:

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

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

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

Infrastructure: No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Hotazel.

Invasive prospecting: The proposed locality of the exploration boreholes has been placed on a wide grid to determine the economic potential. The final locality of the exploration holes can only be determined after the desktop studies and geological mapping have been completed.

Alternatives considered:-

Infrastructure: The only alternative considered was the establishment of offices and storerooms on the farms under application. As Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

Invasive prospecting: The drilling of boreholes over the entire property was considered, but taking into account that Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

**(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.)

Impact	Mitigation	Risk
Air quality	<ul style="list-style-type: none"> <li>• Speed limits;</li> <li>• Spraying of surfaces with water // dust-a-side or similar environmentally friendly product;</li> <li>• Avoidance of unnecessary removal of vegetation;</li> <li>• Re-vegetation and monitoring of re-growth;</li> <li>• Rehabilitation of disturbed areas; and</li> <li>• Controlled drilling operations, preferably on wind-free days.</li> </ul>	Low
Fauna	<ul style="list-style-type: none"> <li>• Speed limits;</li> <li>• Continuous rehabilitation of disturbed areas;</li> <li>• No snares or traps may be set for animals and strict adherence to be communicated to all employees and contractors; and</li> <li>• Maintenance of firebreaks.</li> </ul>	Medium
Flora	<ul style="list-style-type: none"> <li>• Continuous rehabilitation of disturbed areas;</li> <li>• Avoidance of unnecessary removal of vegetation;</li> <li>• Re-vegetation and monitoring of re-growth;</li> <li>• Maintenance of firebreaks;</li> <li>• No trees felled for firewood;</li> <li>• Obtain relevant permit before removal of protected tree or plant species; and</li> <li>• Re-seeding where necessary.</li> </ul>	High
Ground water	<ul style="list-style-type: none"> <li>• Immediate removal of any hydrocarbon spill;</li> <li>• Maintenance in dedicated area;</li> <li>• Re-fuelling in dedicated area;</li> <li>• Drip pans;</li> <li>• Storage of hydrocarbons in dedicated areas; and</li> </ul>	Low

	<ul style="list-style-type: none"> <li>Monitoring of groundwater quality.</li> </ul>	
Noise	<ul style="list-style-type: none"> <li>Hearing protection;</li> <li>Working hours;</li> <li>Controlled drilling operations;</li> <li>Silencers on equipment and vehicles; and</li> </ul>	Medium
Soil	<ul style="list-style-type: none"> <li>Continuous rehabilitation of disturbed areas;</li> <li>Ripping of compacted areas;</li> <li>Maintenance &amp; refuelling in dedicated areas;</li> <li>Drip pans;</li> <li>Storage of hydrocarbons in dedicated areas; and</li> <li>Immediate removal of any hydrocarbon spill.</li> </ul>	Medium
Surface water	<ul style="list-style-type: none"> <li>Storm water control;</li> <li>Control and monitoring of erosion;</li> <li>Immediate removal of any hydrocarbon spill;</li> <li>Maintenance &amp; re-fuelling in dedicated areas;</li> <li>Adhering to buffer zones;</li> <li>Drip pans; and</li> <li>Storage of hydrocarbons in dedicated areas.</li> </ul>	N/A
Topography	<ul style="list-style-type: none"> <li>Sloping of rehabilitated and disturbed areas.</li> </ul>	N/A
Visual	<ul style="list-style-type: none"> <li>Sloping of rehabilitated and disturbed areas;</li> </ul>	Low

**(ix) Motivation where no alternative sites were considered:**

No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Hotazel.

**(x) Statement motivating the preferred site:**

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

No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Hotazel.

**i) 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.**

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

The methodology for the predication and assessment of impacts has been in accordance with *DEA Guideline 5: Assessment of Alternatives and Impacts*. Potential impacts have been rated in terms of the direct, indirect and cumulative impacts.

Criteria taken into account:

- Spatial extent – The size of the area that will be affected by the impact.
- Intensity –The anticipated severity of the impact.
- Duration –The timeframe during which the impact will be experienced.

Using the criteria above, the impacts have further been assessed in terms of the following:

- Probability –The probability of the impact occurring.
- Significance – Will the impact cause a notable alteration of the environment?
- Status - Whether the impact on the overall environment will be positive, negative or neutral.
- Confidence – The degree of confidence in predictions based on available information and specialist knowledge.

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**(j) Assessment of each identified potentially significant impact and risk**

<b>NAME OF ACTIVITY</b> (e.g. For prospecting – drill site, site camp, ablation facility, accommodation, equipment storage, sample storage, site office, access rout 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, ablation, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc...)	<b>POTENTIAL IMPACT</b> (Including the potential impacts for cumulative impacts)  (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> In which impact is anticipated.  (e.g. Construction, commissioning, operational, decommissioning , closure, post-closure)	<b>SIGNIFICANCE</b> If not mitigated	<b>MITIGATION TYPE</b> modify, remedy, control or stop through: (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc...) (e.g. modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation.)	<b>SIGNIFICANCE</b> If mitigated
Access Tracks	<ul style="list-style-type: none"> <li>• Dust</li> <li>• Disturbance of the natural habitat of fauna</li> <li>• Disturbance / destruction of natural vegetation cover</li> <li>• Groundwater contamination from hydrocarbon spills</li> <li>• Noise from vehicles travelling on the access tracks</li> <li>• Compaction of soil.</li> <li>• Erosion</li> </ul>	Air quality Fauna Flora Groundwater Soil Surface water	Phases 3, 5 & 7 Percussion Drilling	Low	<ul style="list-style-type: none"> <li>• Maintenance of access tracks / roads</li> <li>• Dust control and monitoring</li> <li>• Groundwater quality monitoring</li> <li>• Noise control and monitoring</li> <li>• Speed limits</li> <li>• Stormwater run-off control</li> <li>• Erosion control</li> <li>• Immediately clean</li> </ul>	Very Low



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					<ul style="list-style-type: none"> <li>hydrocarbon spills</li> <li>Rip disturbed areas to allow re-growth of vegetation cover</li> </ul>	
Chemical toilets	<ul style="list-style-type: none"> <li>Soil contamination</li> <li>Groundwater contamination</li> </ul>	Groundwater Soil	Phases 3, 5 & 7 Percussion Drilling	Very Low	<ul style="list-style-type: none"> <li>Maintenance of toilets on regular basis.</li> <li>Removal of toilets upon closure.</li> </ul>	N/A
Drilling activities	<ul style="list-style-type: none"> <li>Nuisance dust created by drill rig</li> <li>Disturbance of the natural habitat of fauna</li> <li>Disturbance / destruction of natural vegetation cover</li> <li>Groundwater contamination from hydrocarbon spills</li> <li>Noise from drill rig</li> <li>Compaction and / or disturbance of soil structure</li> <li>Changing of natural aesthetic view of environment by drill rig</li> </ul>	Air quality Fauna Flora Groundwater Soil Surface water	Phases 3, 5 & 7 Percussion Drilling	Medium	<ul style="list-style-type: none"> <li>Avoidance of unnecessary removal of vegetation</li> <li>Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth</li> <li>Controlled drilling operations, preferably on wind-free days</li> <li>Immediate removal of any hydrocarbon spill</li> <li>Maintenance and re-fuelling to take place in dedicated area</li> <li>Drip pans</li> <li>Storage of hydrocarbons in dedicated area</li> <li>Hearing protection</li> <li>Working hours</li> <li>Ripping of compacted areas</li> </ul>	Low

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**(k) 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
Field-Based Heritage Impact Assessment Report (Appendix '9')	<p>The stone tools discovered within the study area require no further action as they are heavily weathered and out of context. The possible historical structures such as old farmhouses built in the 1940s (estimated) is dilapidated (and possibly being dismantled by the owner) is abandoned and occurs close to a water point. It is of low significance since it has already been damaged and in a state of neglect.</p> <p>The Trigonometrical Beacon is of high significance, and it is protected in terms of Act. No. 8. 1997 (Land Survey Act. 1997). According to Section 41(2) any person who for the purpose of carrying out any work which he or she may lawfully perform, desires to remove or disturb any beacon erected in connection with the survey of land shall appoint a land surveyor personally to effect or supervise the removal or disturbance and subsequent replacement of that beacon in accordance with the regulations. Should the prospecting activities directly affect the Trigonometrical beacon, the developer is strongly advised to observe Act No. 8. 1997.</p>	X	Page 60-61

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<p>Desktop Palaeontological Impact Assessment Report (Appendix '10')</p>	<p>The study area was found to be basically devoid of any documented heritage sites. There is a strong likelihood that sites associated with the Stone Age could be found in this area. Mountainous areas could be home to rock art and Stone Age shelters.</p> <p>The palaeontological significance of the site is moderate.</p> <p>Due to the small footprint of the proposed prospecting activities, it is not anticipated that this will have any Significant Impact on heritage resources.</p> <p>Taking into consideration the findings this desktop study it is recommended that the plots identified for the prospect drilling be cleared for the proposed prospecting activities. It is further recommended that the Chance Finds Protocol found in this report be incorporated in the Prospecting Development Management Plan and that it be made available to the site agent or Environmental Control Officer.</p>	<p>X</p>	<p>Page 63</p>
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Attach copies of Specialist Reports as appendices.

**(I) Environmental impact statement**

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

- The creation of the access tracks will have a very low impact on air quality, fauna, flora, groundwater, soil and surface water after the implementation of mitigation measures.
- The chemical toilets are not expected to have an environmental impact should the mitigation measures be implemented.
- The drilling activities will have a low impact on air quality, fauna, flora, groundwater, soil and surface water after the implementation of mitigation measures.

**(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 indicating any areas that should be avoided, including buffers. Attach as Appendix.

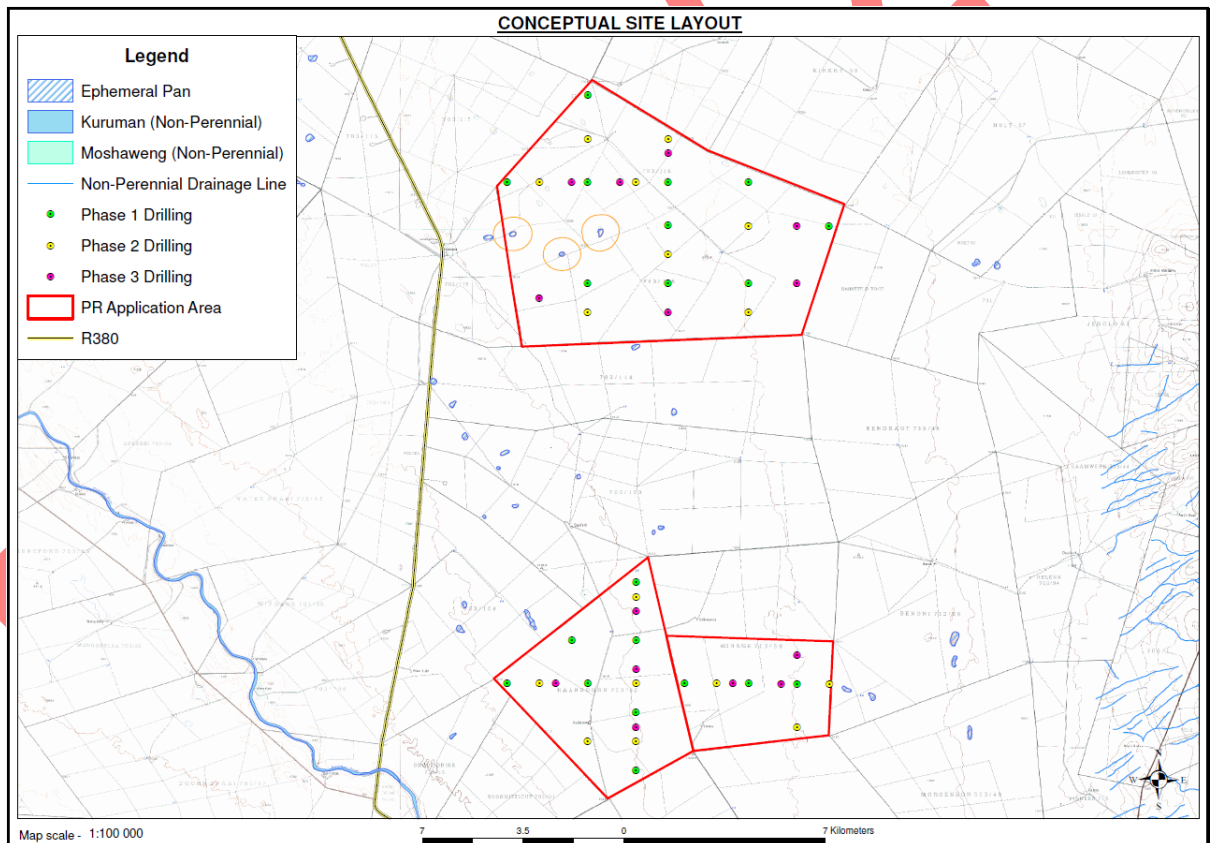


Figure 18 – Site layout with buffer zones

**(iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;**

Infrastructure: No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Hotazel.

Invasive prospecting: The proposed locality of the exploration boreholes has been placed on a wide grid to determine the economic potential. The

final locality of the exploration holes can only be determined after the desktop studies and geological mapping have been completed.

Alternatives considered:-

**Infrastructure:** The only alternative considered was the establishment of offices and storerooms on the farms under application. As Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

**Invasive prospecting:** The drilling of boreholes over the entire property was considered, but taking into account that Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

**(m) 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 for inclusion as conditions of authorisation.

- **Archaeological sites (Chance Findings Procedure):**  
There is a possibility that archaeological materials maybe lying hidden under the surface and where not located during the field surveys conducted in the project area. This therefore does not mean that absence (during surface survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, to ensure compliance with heritage laws and policies for best practice. Should any archaeological materials be revealed from the subsurface, the following procedure should be followed, everyone working on the site must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.
  - If during the drilling operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
  - The senior on-site Manager must then make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area before informing SAHRA/PHRA.
  - If a human grave/burial is encountered, the remains must be left as undisturbed as possible before the local police and SAHRA or PHRA are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency exhumation permit may be issued by SAHRA for an archaeologist to exhume the remains.

The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact;
- Stone concentrations of any formal nature.

The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:

- All operators of excavation 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 construction 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, all activities at the finds must be seized and the South African Police Services (SAPS) should be notified.
  - Mitigation measures (such as refilling etc.) 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.
  - The area should be placed under guard.
  - No media statements should be released until such time as the heritage practitioner has had enough time to analyze the finds.
- Air quality:  
To limit the creation of nuisance dust the following management guidelines should be followed:
    - Speed limits of vehicles inside the application area will be strictly controlled to avoid excessive dust or the excessive deterioration of the farm roads and access tracks to be used.
    - Routine spraying of unpaved site areas and access tracks utilized by the prospecting operation with water // dust-a-side or similar environmentally friendly product;
    - Avoidance of unnecessary removal of vegetation;
    - All cleared, disturbed or exposed areas must be rehabilitated as soon as practically possible to prevent the forming of additional sources of dust.
    - Monitoring of vegetation re-growth in rehabilitated areas.
    - Drilling activities preferably to take place on wind-free days.
- Fauna  
To ensure a minimum of impact to animals the following management guidelines should be followed:
    - Speed limits of vehicles inside the application area will be strictly controlled to avoid road kills.
    - Continuous rehabilitation of disturbed areas to allow the fauna habitat to be re-established.
    - No hunting (snares) will be allowed at the application area.
    - Maintenance of the firebreak.
- Flora
    - Continuous rehabilitation of disturbed areas to allow the natural vegetation cover to be re-established.
    - Avoidance of unnecessary removal of vegetation cover.
    - Monitoring of vegetation re-growth in rehabilitated areas.
    - Maintenance of firebreak.
    - No trees or shrubs will be felled or damaged for the purpose of obtaining firewood.
    - Management will take responsibility to control declared invader or exotic species on the site. The following control methods will be used:

- "The plants will be uprooted, felled or cut off and can be destroyed completely."
- "The plants will be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."
- Valid permits from Northern Cape Nature Conservation will be obtained before any protected plant species are removed.
- All rehabilitated areas, where applicable and possible, will be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to prospecting activities commenced, if the natural succession of vegetation is unacceptably slow.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose.
- The end objective of the re-vegetation program will be to achieve a stable self-sustaining habitat unit.
- Groundwater
  - Immediate removal of any hydrocarbon spill.
  - Vehicle- and equipment maintenance will only be allowed within the dedicated maintenance area.
  - Only emergency breakdowns will be allowed in other areas. The following procedure will be followed if a vehicle or piece of equipment would break down outside of the maintenance area.
    - Drip pans will be placed at all points where diesel, oil or hydraulic fluid may drip and in so doing contaminate the soil.
    - All efforts will be made to move the broken down vehicle or piece of equipment to the maintenance area.
    - If the vehicle/piece of equipment cannot be moved, the broken part will firstly be drained of all fluid. The part will then be removed and taken to the maintenance area.
  - Equipment used as part of the proposed operation will be adequately maintained so as to ensure that oil, diesel, grease or hydraulic fluid does not leak during operation.
  - Fuel and other petrochemicals will be stored in steel receptacles that comply with SANS 10089-1:2003 (SABS 089-1:2003) standards.
  - Monitoring of groundwater quality.
  - Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to.
- Noise
  - Hearing protection will be available for all employees where attenuation cannot be implemented.
  - Working hours will be kept between sunrise and sunset as far as possible.
  - As a minimum, ambient noise levels emanating from the prospecting activities will not exceed 82 dBA at the site boundary. 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 work, exceeds 82 dB (A), the site manager will take the necessary steps to reduce the noise below this level.

- Xhariep will comply with the occupational noise Regulations of the Occupational Health and Safety Act, Act 85 of 1993.
- Xhariep will comply with the measures for good practice with regard to management of noise related impacts during construction and operation.
- 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 drilling area and that which may migrate outside the drilling area.
- 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 will be in good working order and vehicles will adhere to the relevant noise requirements of the Road Traffic Act.
- All vehicles in operation will be equipped with a silencer on their exhaust system.
- Safety measures, which generate noise such as reverse gear alarms on large vehicles, will be appropriately calibrated/adjusted.

- Palaeontological sites

- A site visit by a professional palaeontologist be commissioned by the developer well before the commencement of the invasive phases of the prospecting programme.
- The resulting palaeontological heritage assessment report should make recommendations for any mitigation or monitoring measures to be followed during siting, drilling and rehabilitation of the boreholes as well as for conservation of sedimentary borehole core material for future palaeontological analysis.
- Chance Fossil Finds Procedure as outlined in the Specialist Report should be followed:
  - Safeguarding of fossils.
  - Reporting of all significant finds to SAHRA.
  - Judicious sampling and recording of fossil material and associated geological data by a qualified palaeontologist.
  - Any fossil material collected should be curated within an approved repository (museum / university fossil collection).

- Soil

- In all places of development the first 300mm of loose or weathered material found will be classified as a growth medium. The topsoil will be removed, where possible, from all areas where physical disturbance of the surface will occur.
- In all areas where the above growth medium will be impacted on, it will be removed and stockpiled on a dedicated area. The maximum height of stockpiles will be 2 meters.
- The growth medium/topsoil will be used during the rehabilitation of any impacted areas, after sloping in order to re-establish the same land capability.
- If any soil is contaminated during the life of the prospecting area, it will either be treated on site or be removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility or company.
- Erosion control in the form of re-vegetation and contouring of slopes will be implemented on disturbed areas in and around the site.



- The stored topsoil will be adequately protected from being blown away or being eroded.
- Compacted areas will be ripped to a depth of 300mm, where possible, during the continuous rehabilitation, decommissioning and closure phases of the operation in order to establish a growth medium for vegetation.
- Vehicle movement will be confined to established roads and access tracks for as far as practical in order to prevent the compaction of soils.
- Surface water
  - The disposal of oil, grease and related industrial waste will be transported to the stores area in Hotazel on a daily basis where it will be stored in steel containers supplied by an oil recycling contractor. All oil and grease will be removed on a regular basis from the operation by a registered approved contractor.
  - All refuse and waste from the different sections will be handled according to NEMA Guidelines. Recycling of waste is encouraged in all the consumer sections of the operation, where recyclable materials will be collected before dumping them in the domestic waste disposal area.
  - All non-biodegradable (recyclable) refuse such as glass bottles, plastic bags and metal scrap will be removed from the site on a regular basis and disposed of at a recognized disposal facility.
  - Erosion and storm water control measures will be implemented.
  - Vehicle repairs will only take place within the maintenance area for vehicles.
  - Re-fuelling will only take place in the re-fuelling area. If this is found not be practical, drip trays will be used whenever re-fuelling takes place outside of this area.
  - During rehabilitation the applicant will endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.
  - Adhering to no-prospecting buffer zones placed around dry water courses.
- Topography
  - During rehabilitation the applicant will endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.
- Visual
  - Waste material of any description will be removed from the prospecting area upon completion of the operation and be disposed of at a recognized landfill facility.
  - The drill rigs will be removed from the site upon completion of the prospecting operation.

**(n) Aspects for inclusion as conditions of Authorisation.**

Any aspects which 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 Authorisation.

**(o) Descriptions of any assumptions, uncertainties and gaps in knowledge.**

(Which relate to the assessment and mitigation measures proposed.)

The abovementioned mitigatory measures are tried and tested over many years in the prospecting / mining industry. Xhariep will 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.

The EAP who compiled this document and its annexures have extensive knowledge in her field and it is hereby assumed that the above assumptions are adequate and that the information provided is in the region of 85% - 95% correct.

**(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.**

Five measures of economic impacts can be used to demonstrate the potential effect of the proposed prospecting operation on the local economy:

- Employment - The extent of employment can be measured as number of jobs or in terms of full time equivalents.
- Payroll income - The gross remuneration of employees in terms of salaries and wages.
- Capital Expenditure (CAPEX) - The total amount spent on the purchasing of fixed assets and total spent on construction.
- Operating expenditure and maintenance (OPEX) - The total amount spent locally by businesses on goods and services, excluding salaries and wages as well as rents or interest.
- Revenue - The total value of sales arising from business activity at the prospecting operation.

It is recommended that the activity should be authorized for the above reasons.

**ii) Conditions that must be included in the 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 Authorisation.

**(q) Period for which the Environmental Authorisation is required.**

Five 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.

Xhariep's undertaking to meet the requirements of the Basic Assessment Report and Environmental Management Programme Report is attached at the end of the EMPr and is applicable to both documents.

**(s) Financial Provision**

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

R402 945.84 (excluding VAT)

**(i) Explain how the aforesaid amount was derived.**

The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) requires a holder of a right to provide to the Department of Mineral Resources and Energy (DMRE) sufficient financial provision for environmental rehabilitation and closure requirements of mining operations. Regulation 54 of the MPRDA, 'Quantum of financial provision', as well as the 'Guideline document for evaluation of the quantum of closure-related financial provision provided by a mine' has been used to calculate the required financial provision for the Xhariep Project.

Furthermore, the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires a Right Holder to make financial provision for rehabilitation and remediation; decommissioning and closure activities as well as remediation and management of latent or residual environmental impacts. The 'Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations' as published on 20 November 2015 under Government Notice R. 1147 of Government Gazette 39425 has also been used to guide the calculations in this report.

Calculation criteria:

1. Master Rates:

In terms of the guideline document 'the Master Rates in Section B will be updated on an annual basis, based on CPIX or similar approved method. The first of these updates will take place during 2005.'

The 2004 Master Rates were updated annually in terms of the published STATS SA CPI rates:

(<http://www.statssa.gov.za/publications/P0141/CPIHistory.pdf>).

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2005	3,0	2,6	3,0	3,4	3,3	2,8	3,4	3,9	4,4	4,0	3,4	3,6	3,4
2006	4,0	3,9	3,4	3,3	3,9	4,9	5,0	5,4	5,3	5,4	5,4	5,8	4,7
2007	6,0	5,7	6,1	7,0	6,9	7,0	7,0	6,7	7,2	7,9	8,4	9,0	7,1
2008	9,3	9,8	10,6	11,1	11,7	12,2	13,4	13,7	13,1	12,1	11,8	9,5	11,5
2009	8,1	8,6	8,5	8,4	8,0	6,9	6,7	6,4	6,1	5,9	5,8	6,3	7,1
2010	6,2	5,7	5,1	4,8	4,6	4,1	3,7	3,5	3,2	3,4	3,6	3,5	4,3
2011	3,7	3,7	4,1	4,2	4,6	5,0	5,3	5,3	5,7	6,0	6,1	6,1	5,0
2012	6,3	6,1	6,0	6,1	5,7	5,5	4,9	5,0	5,5	5,6	5,6	5,7	5,6
2013	5,4	5,9	5,9	5,9	5,6	5,5	6,3	6,4	6,0	5,5	5,3	5,4	5,7
2014	5,8	5,9	6,0	6,1	6,6	6,6	6,3	6,4	5,9	5,9	5,8	5,3	6,1
2015	4,4	3,9	4,0	4,5	4,6	4,7	5,0	4,6	4,6	4,7	4,8	5,2	4,6
2016	6,2	7,0	6,3	6,2	6,1	6,3	6,0	5,9	6,1	6,4	6,6	6,8	6,4
2017	6,6	6,3	6,1	5,3	5,4	5,1	4,6	4,8	5,1	4,8	4,6	4,7	5,3
2018	4,4	4,0	3,8	4,5	4,4	4,6	5,1	4,9	4,9	5,1	5,2	4,5	4,7
2019	4,0	4,1	4,5	4,4	4,5	4,5	4,0	4,3	4,1	3,7	3,6	4,0	4,1
2020	4,5	4,6	4,1	3,0	2,1	2,2	3,2	3,1	3,0	3,3	3,2	3,1	3,3
2021	3,2	2,9	3,2	4,4	5,2	4,9	4,6	4,9	5,0	5,0	5,5	5,9	4,5
2022	5,7	5,7	5,9	5,9	6,5	7,4	7,8						

2. Procedure to determine the quantum for financial provision:

2.1. Step 1 – Determine mineral mined and saleable by-products:

In terms of Tables B.12 and B.13 of the Guideline Document the activities to be conducted under the Prospecting Right has been classified as a Small Mine under the category 'Mine, mine waste'. Xhariep will not establish a processing plant at the site. The primary risk class for the type of mineral mined / processed are as follows:

Mineral	Table	Primary Risk Class
Cobalt	B.12	Risk Class C (Low)
Diamond - Alluvial - General - In Kimberlite	B.12	Risk Class C (Low)
Gold Ore	B.12	Risk Class B (Medium)
Iron Ore	B.12	Risk Class C (Low)
Manganese Ore	B.13	N/A
Platinum Group Metals	Not Listed	
Zinc Ore	B.12	Risk Class C (Low)

2.2. Step 2A – Determine primary risk class:

The primary risk class in terms of the information contained in Tables B.12 and B.13 the primary risk class for the project is Class B (Medium Risk).

2.3. Step 2B – Revise primary risk class (if applicable) based on saleable by-products:

Not applicable – No by-products have been identified.

2.4. Step 3 – Determine environmental sensitivity of mine area:

The site the sensitivity of the PR area, in terms of Table B.4 of the Guideline Document, has been determined as follows:

Sensitivity	Sensitivity criteria		
	Biophysical	Social	Economic
Low		X	X
Medium			
High	X		

2.5. Step 4 – For Class A or B mining operations:

2.5.1. Step 4.1 – Determine level of information available:

The level of information available for the operation is classified as 'extensive':

- An BAR/EMPr that is in the process of being approved;
- Closure Plan (included in the BAR/EMPr)
- Detailed breakdown of the costs (included in the BAR/EMPr).

2.5.2. Step 4.2 – Identify closure components:

The operation has been classified as an open-cast activity, which triggers all components, with the exception of Component No. 7 – Sealing of shafts, adits and inclines, as listed in Table B.5 of the Guideline Document.

2.5.3. Step 4.3 – Identify unit rates for closure components:  
In terms of Table B.6 of the Guideline Document the unit rates for the closure components were determined as follows:

Component	Risk Class	Sensitivity	Multiplication Factor	Unit	Master Rate (2004)	Master Rate (2022)
1	A	Medium	1.00	m <sup>3</sup>	6.82	17.38
2(A)	A	Medium	1.00	m <sup>2</sup>	95.00	242.05
2(B)	A	Medium	1.00	m <sup>2</sup>	140.00	356.71
3	A	Medium	1.00	m <sup>2</sup>	17.00	43.31
4(A)	A	Medium	1.00	m	165.00	420.41
4(B)	A	Medium	1.00	m	90.00	229.31
5	A	Medium	1.00	m <sup>2</sup>	190.00	484.1
6	A	Medium	0.52	Ha	96,700.00	246,383.83
7	N/A	N/A	N/A	N/A	N/A	N/A
8(A)	A	Medium	1.00	Ha	66,400.00	164,086.02
8(B)	A	Medium	1.00	Ha	82,700.00	210,712.95
8(C)	A	Medium	0.80	Ha	240,200.00	612,010.29
9	A	Medium	1.00	Ha	55,600.00	141,664.33
10	A	Medium	1.00	Ha	52,600.00	134,020.57
11	A	Medium	1.00	Ha	52,600.00	134,020.57
12	A	Medium	1.00	m	60.00	152.88
13	A	Medium	0.67	Ha	20,000.00	50,958.39
14	A	Medium	1.00	Ha	7,000.00	17,835.44

2.5.4. Step 4.4 – Identify and apply weighting factors:  
In terms of Tables B.7 and B.8 of the Guideline Document the weighting factors were determined as follows:

- Weighting Factor 1:  
The nature of the terrain is flat, thus a weighting factor of 1.00 is used.
- Weighting Factor 2:  
The site is situated within 150km of a developed urban area, thus a weighting factor of 1.05 is used (Peri-urban).

2.5.5. Step 4.5 – Identify areas of disturbance:

No	Description	Quantity
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)  Not applicable – Xhariep will not establish any processing plants at the site.	0m <sup>3</sup>
2(A)	Demolition of steel buildings and structures  Not applicable – Xhariep will not establish any steel buildings or structures at the site.	0m <sup>2</sup>

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2(B)	Demolition of reinforced concrete buildings and structures  Not applicable – Xhariep will not establish any reinforced concrete buildings and structures at the site.	0m <sup>2</sup>
3	Rehabilitation of access roads  Provision is made for 500m x 3m wide two-spool access tracks.	1 500m <sup>2</sup>
4(A)	Demolition and rehabilitation of electrified railway lines  There are no electrified railway lines on the site.	0m
4(B)	Demolition and rehabilitation of non-electrified railway lines  There are no non-electrified railway lines on the site.	0m
5	Demolition of housing and/or administration facilities  Not applicable – Xhariep will not establish any housing and/or administration facilities at the site.	0m <sup>2</sup>
6	Opencast rehabilitation including final voids and ramps  Not applicable – Xhariep's Prospecting Right does not make provision for bulk sampling.	0Ha
7	Sealing of shafts adits and inclines  Not applicable – Xhariep's activities has been classified as 'open-cast'.	0m <sup>3</sup>
8(A)	Rehabilitation of overburden and spoils  Not applicable – Xhariep's Prospecting Right does not make provision for bulk sampling.	0Ha
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)  Not applicable – Xhariep's Prospecting Right does not make provision for bulk sampling.	0Ha
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)  Not applicable – Xhariep's Prospecting Right does not make provision for bulk sampling.	0Ha
9	Rehabilitation of subsided areas  Not applicable – There are no subsided areas at the site.	0Ha
10	General surface rehabilitation  Provision is made for 50 boreholes with a 20m x 20m surface disturbance each.	2Ha
11	River diversions  There are no rivers at the site.	0Ha
12	Fencing  Not applicable – Xhariep will not establish any fences at the site.	0m

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13	Water management  Not applicable – Xhariep will not establish any water related infrastructure at the site.	0Ha
14	2 to 3 years maintenance and aftercare  Not application at this early stage of the application process.	0Ha
15 (A) & 15(B)	Specialist study  Refer to Step 4.6 below	

2.5.6. Step 4.6 – Identify closure costs from specialist studies:  
In terms of Table B.9 of the Guideline Document provision must be made for a Screening Level Risk Assessment.

Provision is thus made for an estimated cost of such a specialist report.

2.5.7. Step 4.7 – Calculate closure costs:  
In terms of Table B.10 of the Guideline Document 6% of Subtotal 1 must be added under 'Preliminary and General' if Subtotal 1 is less than R100,000,000.00 and 10% of Subtotal 1 must be added under 'Contingencies'.

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0.00	17.38	1	1	0.00
2 (A)	Demolition of steel buildings and structures	m2	0.00	242.05	1	1	0.00
2(B)	Demolition of reinforced concrete buildings and structures	m2	0.00	356.71	1	1	0.00
3	Rehabilitation of access roads	m2	1 500.00	43.31	1	1	64 971.95
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0.00	420.41	1	1	0.00
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m	0.00	229.31	1	1	0.00
5	Demolition of housing and/or administration facilities	m2	0.00	484.10	1	1	0.00
6	Opencast rehabilitation including final voids and ramps	ha	0.000	246 383.83	1	1	0.00
7	Sealing of shafts adits and inclines	m3	0.00	129.94	1	1	0.00
8 (A)	Rehabilitation of overburden and spoils	ha	0.000	164 086.02	1	1	0.00
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.00	210 712.95	1	1	0.00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0.00	612 010.29	1	1	0.00
9	Rehabilitation of subsided areas	ha	0.00	141 664.33	1	1	0.00
10	General surface rehabilitation	ha	2.00	134 020.57	1	1	268 041.14
11	River diversions	ha	0.00	134 020.57	1	1	0.00
12	Fencing	m	0.00	152.88	1	1	0.00
13	Water management	ha	0.00	50 958.39	1	1	0.00
14	2 to 3 years of maintenance and aftercare	ha	0.00	17 835.44	1	1	0.00
15 (A)	Specialist study	Sum	0.00	10 000.00	1	1	0.00
15 (B)	Specialist study	Sum	0.00	10 000.00	1	1	0.00
<b>Total of 1 - 15 above</b>							<b>333 013.09</b>

<b>weighting factor 2</b>
1.05

<b>Subtotal 1</b>	<b>349 663.75</b>
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1	Preliminary and General (6% of Sub Total 1)	19 980.79	19 980.79
2	Contingencies (10% of Sub Total 1)	33 301.31	33 301.31
<b>Subtotal 2</b>		<b>402 945.84</b>	

VAT (15%)	60 441.88
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<b>Grand Total</b>	<b>463 387.72</b>
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**(ii) Confirm that this amount can be provided for 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.)

Provision has been made in table 9.1 of the Prospecting Work Programme for rehabilitation.

**(t) Specific information required by the competent Authority  
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 an Appendix.)

- Impact on landowner:  
Positive: Compensation of land lost to prospecting.  
Negative: Temporary loss of grazing land.
- Impact on other I&AP:
  - Employment - The extent of employment can be measured as number of jobs or in terms of full time equivalents.
  - Payroll income - The gross remuneration of employees in terms of salaries and wages.
  - Capital Expenditure (CAPEX) - The total amount spent on the purchasing of fixed assets and total spent on construction.
  - Operating expenditure and maintenance (OPEX) - The total amount spent locally by businesses on goods and services, excluding salaries and wages as well as rents or interest.
  - Revenue - The total value of sales arising from business activity at the prospecting operation.

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

The Heritage Impact Assessment Report and Palaeontological Heritage Report should list a number of recommendations relating to any archaeological or palaeontological finds.

Should these recommendations be adhered to by Xhariep, no impact on any national estate in terms of Section 3(2) of the National Heritage Resources Act is foreseen.

**(u) 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.)

No viable alternatives were found.



**PART B**  
**ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

**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.)

Refer to Part A, page 4 of this document for the details of M and S Consulting (Pty) Ltd.

**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.)

Xhariep's prospecting activities for Cobalt, Diamond (Alluvial, General, In Kimberlite), Gold Ore, Iron Ore, Manganese Ore, Platinum Group Metals and Zinc Ore shall be conducted in nine phases over a period of five years.

Phase	Activity <small>(what are the activities that are planned to achieve optimal prospecting)</small>	Skill(s) required <small>(refers to the competent personnel that will be employed to achieve the required results)</small>	Timeframe <small>(in months) for the activity)</small>	Outcome <small>(What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)</small>	Timeframe for outcome <small>(deadline for the expected outcome to be delivered)</small>	What technical expert will sign off on the outcome? <small>(e.g. geologist, mining engineer, surveyor, economist, etc)</small>
1	<b>Non-invasive Prospecting</b> Reconnaissance visit	Geologist	Month 1	Memorandum to address any problems	Month 2	Geologist
2	<b>Non-invasive Prospecting</b> Review of historical activities; Desktop study; and Geological Mapping	Geologist	Month 2 - 12	Map & Report	Month 13	Geologist
3	<b>Invasive Prospecting</b> Phase 1 Percussion drilling	Geologist & Drilling contractor	Month 13 - 24	Drill logs	Month 24	Geologist
4	<b>Non-invasive Prospecting</b> Analysis of drill samples	Laboratory	Month 13 – 24 (Concurrent with drilling)	<ul style="list-style-type: none"> <li>• Analyses sheets</li> <li>• Laboratory report</li> <li>• Map</li> <li>• Report</li> </ul>	Month 24	Laboratory & Geologist
5	<b>Invasive Prospecting</b> Phase 2 Percussion drilling	Geologist & Drilling contractor	Month 25 – 36	Drill logs	Month 36	Geologist
6	<b>Non-invasive Prospecting</b> Analysis of drill samples	Laboratory	Month 25 – 36 (Concurrent with drilling)	<ul style="list-style-type: none"> <li>• Analyses sheets</li> <li>• Laboratory report</li> <li>• Map</li> <li>• Report</li> </ul>	Month 36	Laboratory & Geologist
7	<b>Invasive Prospecting</b> Phase 3 Percussion drilling	Geologist & Drilling contractor	Month 37 - 48	Drill logs	Month 48	Geologist
8	<b>Non-invasive Prospecting</b> Analysis of drill samples	Laboratory	Month 37 - 48 (Concurrent with drilling)	<ul style="list-style-type: none"> <li>• Analyses sheets</li> <li>• Laboratory report</li> <li>• Map</li> <li>• Report</li> </ul>	Month 48	Laboratory & Geologist
9	<b>Non-Invasive Prospecting</b> Consolidation and interpretation of results / data	Geologist	Month 49 - 60	Feasibility Report	Month 60	Geologist & CEO

**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 on the preferred site, indicating any areas that should be avoided, including buffers.)

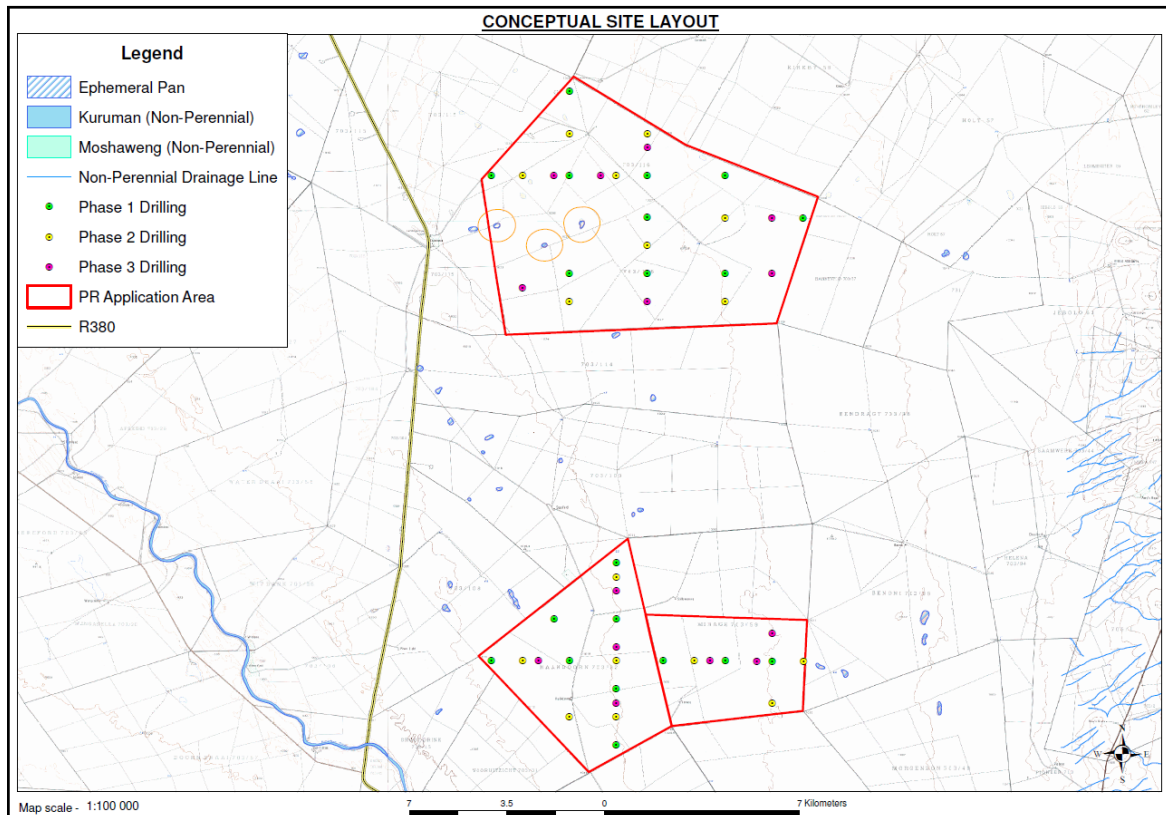


Figure 19 – Conceptual site layout (See Appendix '4')

**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.)

- The main closure objective of Xhariep's planned prospecting operation is to restore the site to its current land capability in a sustainable matter.
- To prevent the sterilization of any ore 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.

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

The only water use at the site will be for domestic use (drinking water). The drilling team, consisting of five people, will be on the site during Phases 3, 5 and 7 of the prospecting operation (percussion drilling). Provision for 50 litres of water per day is made for drinking water.

Xhariep plans to make use of a percussion drill rig. Should an alternative type of drill be utilized, i.e. reverse circulation, water for the drill rig will be needed.

**(iii) Has a water use license been applied for?**

Xhariep considers the following water use alternatives:

- Municipal water: Xhariep obtains municipal water from a nearby town. The municipal water will be transported to the site.
- Groundwater: Xhariep makes use of groundwater for the drinking water and for the drilling rigs, should a drilling method other than percussion drilling be used.

The Acting Director-General of Water and Sanitation has, in terms of Section 39 of the National Water Act, published the revised General Authorisation (GNR 538 of 02 September 2016) pertaining to the taking and storing of water, water uses in terms of Section 21(a) and 21(b) of the National Water Act respectively.

The General Authorisation came into effect on 1 March 2017 and replaced the General Authorisation for the taking and storing of water contained in GNR399 of 26 March 2004. In terms of clause 7.2 of the Schedule to the 2017 General Authorisations, registration of a water use is only required if more than 10m<sup>3</sup> of water is taken from a groundwater resource per day on average over a year on a property.

As stated in paragraph d(ii) above, Xhariep's water use shall not exceed 10 000 litres (10m<sup>3</sup>) per day. Accordingly, Xhariep is not required to apply for a water use license or register its water use after 3 March 2017 with the responsible authority by virtue of clause 7 of the 2017 General Authorisations.

Xhariep shall obtain relevant authorisation, where necessary, for its intended water use/s before invasive prospecting activities commence. The water use alternative decided upon, once invasive prospecting commences, shall be set out in the surface use agreement/s with the surface owners.

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**(iv) Impacts to be mitigated in their respective phases**

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

<b>ACTIVITY</b> (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...)	<b>PHASE</b> Of operation in which activity will take place  State: Planning and design, pre-construction, construction, operational, rehabilitation, closure, post-closure	<b>SIZE AND SCALE of disturbances</b> Volumes, tonnages and hectares or m <sup>2</sup> )	<b>MITIGATION MEASURES</b> (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants.)	<b>COMPLIANCE WITH STANDARDS</b> (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)	<b>TIME PERIOD FOR IMPLEMENTATION</b> 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: <ul style="list-style-type: none"> <li>- Upon cessation of the individual activity, or</li> <li>- Upon cessation of the mining, bulk sampling or alluvial diamond prospecting as the case may be.</li> </ul>
Two-Spoor Access Tracks	Operational Rehabilitation Closure	1 500m <sup>2</sup>	<ul style="list-style-type: none"> <li>• Maintenance of roads / access tracks.</li> <li>• Dust control and monitoring.</li> <li>• Groundwater quality monitoring</li> <li>• Noise control and monitoring.</li> <li>• Speed limits.</li> <li>• Stormwater run-off control</li> <li>• Erosion control</li> <li>• Immediately clean hydrocarbon spills</li> </ul>	The following must be placed at the site and is applicable to all activities: <ul style="list-style-type: none"> <li>○ Relevant Legislation;</li> <li>○ Acts;</li> <li>○ Regulations;</li> <li>○ COP's; and</li> <li>○ SOP's</li> </ul> Management and staff must be trained to understand the contents of these documents, and	Ripping of access tracks upon closure of prospecting right.

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			<ul style="list-style-type: none"> <li>Ripping of access tracks / roads upon closure.</li> </ul>	to adhere to thereto.	
Chemical toilets	Operational Closure	6m <sup>2</sup> each	<ul style="list-style-type: none"> <li>Maintenance of the toilets.</li> <li>Removal of toilets upon closure.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Awareness Training must be provided to employees.</li> </ul>	Removal of toilets upon closure of prospecting right.
Drilling activities	Operational Rehabilitation Closure	2 Ha	<ul style="list-style-type: none"> <li>Avoidance of unnecessary removal of vegetation.</li> <li>Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth</li> <li>Controlled drilling operations, preferably on wind-free days</li> <li>Immediate removal of any hydrocarbon spills</li> <li>Maintenance and re-fuelling to take place in dedicated area</li> <li>Drip pans</li> <li>Storage of hydrocarbons in dedicated area</li> <li>Hearing protection</li> <li>Working hours kept between sun-up and sun-down</li> <li>Ripping of compacted / disturbed areas</li> </ul>	<ul style="list-style-type: none"> <li>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 to thereto.</li> </ul> <p>Bi-annually Performance Assessment Reports and Quantum Calculations must be done to ensure that the operation adheres to the contents of the BAR &amp; EMPr documents.</p>	Ripping of disturbed areas upon closure of prospecting right.

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**e) Impact Management Outcomes**

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

<b>ACTIVITY</b> (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...)	<b>POTENTIAL IMPACT</b> (Including the potential impacts for cumulative impacts)  (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> In which impact is anticipated.  (e.g. Construction, commissioning, operational, decommissioning, closure, post-closure)	<b>MITIGATION TYPE</b> modify, remedy, control or stop through: (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc...) (e.g. modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation.)	<b>STANDARD TO BE ACHIEVED</b>  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives etc.)
Access tracks	<ul style="list-style-type: none"> <li>• Dust</li> <li>• Disturbance of the natural habitat of fauna</li> <li>• Disturbance / destruction of natural vegetation cover</li> <li>• Groundwater contamination from hydrocarbon spills</li> <li>• Noise from vehicles travelling on the access tracks</li> <li>• Compaction of soil.</li> <li>• Erosion</li> </ul>	Air quality Fauna Flora Groundwater Soil Surface water	Operational Rehabilitation Closure	<ul style="list-style-type: none"> <li>• Maintenance of access tracks</li> <li>• Dust control and monitoring</li> <li>• Groundwater quality monitoring</li> <li>• Noise control and monitoring</li> <li>• Speed limits</li> <li>• Stormwater run-off control.</li> <li>• Erosion control</li> <li>• Immediately clean hydrocarbon spills</li> <li>• Rip disturbed areas to allow re-growth of vegetation cover</li> </ul>	<ul style="list-style-type: none"> <li>• Safety ensured.</li> <li>• Dust levels minimized.</li> <li>• Minimize potential for hydrocarbon spills to infiltrate into groundwater.</li> <li>• Noise levels minimized.</li> <li>• Rehabilitation standards and closure objectives met.</li> <li>• Erosion potential minimized.</li> </ul>

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Chemical toilets	<ul style="list-style-type: none"> <li>• Soil contamination</li> <li>• Groundwater contamination</li> </ul>	Groundwater Soil	Operational Closure	<ul style="list-style-type: none"> <li>• Maintenance of toilets on regular basis.</li> <li>• Removal of toilets upon closure.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.</li> </ul>
Drilling activities	<ul style="list-style-type: none"> <li>• Nuisance dust created by drill rig</li> <li>• Disturbance of the natural habitat of fauna</li> <li>• Disturbance / destruction of natural vegetation cover</li> <li>• Groundwater contamination from hydrocarbon spills</li> <li>• Noise from drill rig</li> <li>• Compaction and / or disturbance of soil structure</li> <li>• Changing of natural aesthetic view of environment by drill rig</li> </ul>	Air quality Fauna Flora Groundwater Soil Surface water	Operational Rehabilitation Closure	<ul style="list-style-type: none"> <li>• Avoidance of unnecessary removal of vegetation</li> <li>• Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth</li> <li>• Controlled drilling operations, preferably on wind-free days</li> <li>• Immediate removal of any hydrocarbon spill</li> <li>• Maintenance and re-fuelling to take place in dedicated area</li> <li>• Drip pans</li> <li>• Storage of hydrocarbons in dedicated area</li> <li>• Hearing protection</li> <li>• Working hours</li> <li>• Ripping of compacted areas</li> </ul>	<ul style="list-style-type: none"> <li>• Dust levels minimized.</li> <li>• Rehabilitation standards and closure objectives met.</li> <li>• Minimize potential for hydrocarbon spills to infiltrate into groundwater.</li> <li>• Erosion potential minimized.</li> <li>• Noise levels minimized.</li> </ul>

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**f) Impact Management Actions**

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs © and (d) will be achieved.)

<b>ACTIVITY</b> (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...)	<b>POTENTIAL IMPACT</b> (Including the potential impacts for cumulative impacts)  (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	<b>MITIGATION MEASURES</b> (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants.)	<b>TIME PERIOD FOR IMPLEMENTATION</b>  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: <ul style="list-style-type: none"> <li>- Upon cessation of the individual activity, or</li> <li>- Upon cessation of the mining, bulk sampling or alluvial diamond prospecting as the case may be.</li> </ul>	<b>COMPLIANCE WITH STANDARDS</b>  (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 management standards or practices that have been identified by Competent Authorities.)
Access tracks	<ul style="list-style-type: none"> <li>• Dust</li> <li>• Disturbance of the natural habitat of fauna</li> <li>• Disturbance / destruction of natural vegetation cover</li> <li>• Groundwater contamination from hydrocarbon spills</li> <li>• Noise from vehicles travelling on the access tracks</li> <li>• Compaction of soil.</li> <li>• Erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of access tracks / roads</li> <li>• Dust control and monitoring</li> <li>• Groundwater quality monitoring</li> <li>• Noise control and monitoring</li> <li>• Speed limits</li> <li>• Stormwater run-off control.</li> <li>• Erosion control</li> <li>• Immediately clean hydrocarbon spills</li> <li>• Rip disturbed areas to allow re-growth of vegetation cover</li> </ul>	Ripping of access tracks upon closure of prospecting right.	The following must be placed at the site and is applicable to all activities: <ul style="list-style-type: none"> <li>○ Relevant Legislation;</li> <li>○ Acts;</li> <li>○ Regulations;</li> <li>○ COP's; and</li> <li>○ SOP's</li> </ul> Management and staff must be trained to understand the contents of these documents, and to adhere to thereto.
Chemical toilets	<ul style="list-style-type: none"> <li>• Soil contamination</li> <li>• Groundwater</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of toilets on regular basis.</li> </ul>	Removal of toilets upon closure of prospecting right.	The following must be placed at the site and is



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	contamination	<ul style="list-style-type: none"> <li>• Removal of toilets upon closure.</li> </ul>		<p>applicable to all activities:</p> <ul style="list-style-type: none"> <li>○ Relevant Legislation;</li> <li>○ Acts;</li> <li>○ Regulations;</li> <li>○ COP's; and</li> <li>○ SOP's</li> </ul> <p>Management and staff must be trained to understand the contents of these documents, and to adhere to thereto.</p>
Drilling activities	<ul style="list-style-type: none"> <li>• Nuisance dust created by drill rig</li> <li>• Disturbance of the natural habitat of fauna</li> <li>• Disturbance / destruction of natural vegetation cover</li> <li>• Groundwater contamination from hydrocarbon spills</li> <li>• Noise from drill rig</li> <li>• Compaction and / or disturbance of soil structure</li> <li>• Changing of natural aesthetic view of environment by drill rig</li> </ul>	<ul style="list-style-type: none"> <li>• Avoidance of unnecessary removal of vegetation</li> <li>• Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth</li> <li>• Controlled drilling operations, preferably on wind-free days</li> <li>• Immediate removal of any hydrocarbon spill</li> <li>• Maintenance and re-fuelling to take place in dedicated area</li> <li>• Drip pans</li> <li>• Storage of hydrocarbons in dedicated area</li> <li>• Hearing protection</li> <li>• Working hours</li> <li>• Ripping of compacted areas</li> </ul>	Ripping of drilling sites upon closure of prospecting right.	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> <li>○ Relevant Legislation;</li> <li>○ Acts;</li> <li>○ Regulations;</li> <li>○ COP's; and</li> <li>○ SOP's</li> </ul> <p>Management and staff must be trained to understand the contents of these documents, and to adhere to thereto.</p>

**g) Financial Provision**

**(1) Determination of the amount of Financial Provision.**

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

- The main closure objective of Xhariep's planned prospecting operation is to restore the site to its current land capability in a sustainable matter.
- To prevent the sterilization of any ore 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.

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

A meeting was held on the 16<sup>th</sup> of November 2022 with the surface owners and other interested and/or affected parties. The attendees of this meeting were provided with a copy of the draft BAR/EMPr document. The closure objectives of Xhariep, as contained in the BAR/EMPR, were discussed during this meeting.

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

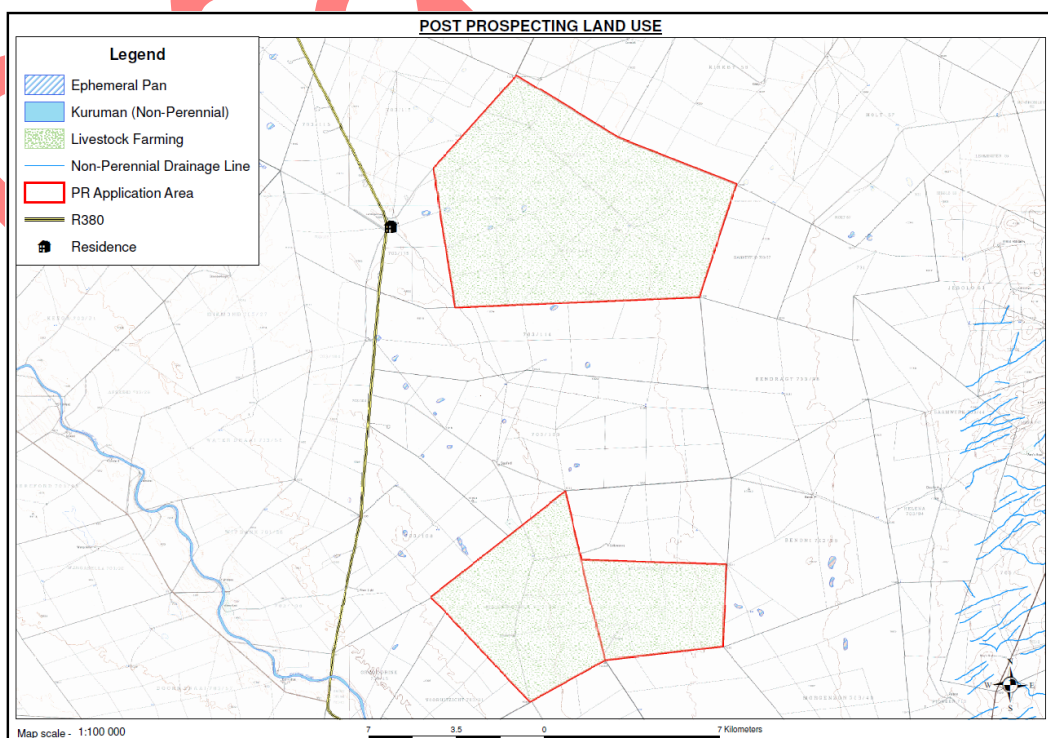


Figure 20 – Post prospecting land use map

Rehabilitation Plan:

- Rehabilitation of boreholes
  - All shallow boreholes (i.e. <10m) will be backfilled and levelled.
  - All boreholes deeper than 10m will be covered with a metal plate and 1000mm of previously stored topsoil.
- Final rehabilitation of access tracks and / roads

After rehabilitation has been completed, all roads will be ripped or ploughed, 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 will be submitted biennially to the Department of Mineral Resources and Energy - Kimberley, as described in Regulation 55.
- Maintenance (Aftercare)

Maintenance after closure will mainly concern the regular inspection and monitoring and/or completion of the re-vegetation programme for a period of at least two rainy seasons.

The aim of this Environmental Management Plan is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.

The aim with the closure of the prospecting operation will be to create an acceptable post-prospecting environment and land-use. Therefore all agreed commitments will be implemented by Prospecting Management.

- After-effects following closure
  - Acid drainage  
No potential for bad quality leach ate or acid drainage development exists.
  - Long term impact on ground water and / or surface water.  
No after effect on the groundwater yield or quality or surface water quality is expected.
  - Long-term stability of rehabilitated land  
One of the main aims of any rehabilitated ground will be to obtain a self-sustaining and stable end result. Xhariep's prospecting activities will not include bulk sampling which could impact on the stability of the land.

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

The main closure objective of Xhariep's planned prospecting operation is to restore the site to its current land capability in a sustainable matter. The rehabilitation activities proposed in the above rehabilitation plan will ensure that the land reverts back to grazing land upon closure of the prospecting right.

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

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0.00	17.38	1	1	0.00
2 (A)	Demolition of steel buildings and structures	m2	0.00	242.05	1	1	0.00
2(B)	Demolition of reinforced concrete buildings and structures	m2	0.00	356.71	1	1	0.00
3	Rehabilitation of access roads	m2	1 500.00	43.31	1	1	64 971.95
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0.00	420.41	1	1	0.00
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m	0.00	229.31	1	1	0.00
5	Demolition of housing and/or administration facilities	m2	0.00	484.10	1	1	0.00
6	Opencast rehabilitation including final voids and ramps	ha	0.000	246 383.83	1	1	0.00
7	Sealing of shafts adits and inclines	m3	0.00	129.94	1	1	0.00
8 (A)	Rehabilitation of overburden and spoils	ha	0.000	164 086.02	1	1	0.00
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.00	210 712.95	1	1	0.00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0.00	612 010.29	1	1	0.00
9	Rehabilitation of subsided areas	ha	0.00	141 664.33	1	1	0.00
10	General surface rehabilitation	ha	2.00	134 020.57	1	1	268 041.14
11	River diversions	ha	0.00	134 020.57	1	1	0.00
12	Fencing	m	0.00	152.88	1	1	0.00
13	Water management	ha	0.00	50 958.39	1	1	0.00
14	2 to 3 years of maintenance and aftercare	ha	0.00	17 835.44	1	1	0.00
15 (A)	Specialist study	Sum	0.00	10 000.00	1	1	0.00
15 (B)	Specialist study	Sum	0.00	10 000.00	1	1	0.00
<b>Total of 1 - 15 above</b>							<b>333 013.09</b>

<b>weighting factor 2</b>
1.05

<b>Subtotal 1</b>	<b>349 663.75</b>
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1	Preliminary and General (6% of Sub Total 1)	19 980.79	19 980.79
2	Contingencies (10% of Sub Total 1)	33 301.31	33 301.31
<b>Subtotal 2</b>		<b>402 945.84</b>	<b>402 945.84</b>

VAT (15%)	60 441.88
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<b>Grand Total</b>	<b>463 387.72</b>
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- f. Confirm that the financial provision will be provided as determined.

Xhariep shall submit to the DMRE a financial guarantee upon request therefore.

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

- a. Monitoring of Impact Management Actions
- b. Monitoring and reporting frequency
- c. Responsible persons
- d. Time period for implementing impact management actions
- e. Mechanism 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
- Access tracks - Drilling activities	Air quality	A single bucket monitoring system must be placed on the site during the drilling phase to measure the air quality levels and to ensure that Xhariep's operation adheres to the Management Standards as set out in the Atmospheric Pollution Prevention Act (45 of 1965), the Regulations of the MPRDA (28 of 2002) and the Mine, Health and Safety Act (29 of 1996).	Project manager Environmentalist	Monthly fall-out dust sampling and quarterly reporting to DMRE during phases 3, 5 and 7.
- Access tracks - Drilling activities	Flora	A registered mine surveyor must conduct measurements of disturbed and rehabilitated areas on a quarterly basis. The measurements must be plotted on plans and kept for life of operation.	Project manager Environmentalist	Annual surveys and included with performance assessment reports submitted to the DMRE biennially.
- Access tracks - Drilling activities	Groundwater	Water samples must be taken and analysed to ensure that they comply with the SANS 241-1:2011 drinking water quality. Water levels must be measured.	Project manager Environmentalist	Biennial analysis and included with performance assessment reports and submitted to the DMRE biennially.

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<ul style="list-style-type: none"><li>- Access tracks</li><li>- Drilling activities</li></ul>	Noise	Noise readings must be taken at pre-determined noise monitoring points with sufficient, calibrated sound level meter during drilling activities.	Project manager Environmentalist	Monthly analysis and included with performance assessment reports and submitted to the DMRE biennially.
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**i) Indicate the frequency of the submission of the performance assessment / environmental audit report.**

An Audit Report will be conducted biennially in line with Regulation 26(e) of the Environmental Impact Assessment Regulations, 2014 of the National Environmental Management Act, 1998 (Act no 107 of 1998) (NEMA) and per Regulation 55(2) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

**j) Environmental Awareness Plan**

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

Xhariep shall provide and discuss the Environmental Awareness Plan with each employee during pre-employment induction. Monthly Environmental Awareness training shall be provided during life of operation.

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

Xhariep shall ensure that there is an Emergency Response Plan on site, clearly indicating the different procedures to potential incidents.

**k) Specific information required by the Competent Authority**

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

The financial quantum will be conducted annually as is prescribed by Regulation 54 of the MPRDA and Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations of the NEMA.

Xhariep shall provide the DMRE with a progress and results report annually.

**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:

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Name of company:

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Date:

Draft