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: ORION EXPLORATION NO. 4 (PTY) LTD

TEL NO: 087 310 5468
CELL NO: 083 308 2044 – MR. M. BIRCH
FAX NO: 086 672 1172
POSTAL ADDRESS: P.O. BOX 41490, CRAIGHALL, JOHANNESBURG, 2021
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FILE REFERENCE NUMBER SAMRAD: (NC) 30/5/1/1/2/12567 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 ranking 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)

- Twelve years professional experience, in terms of Section 15(1) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Section 24 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 1 (Neeldale) of the Farm Eyerdop Pan 58; Remaining Extent of Portion 2 (Witkop) of the Farm Eyerdop Pan 58; Portion 3 (a portion of Portion 2 – Eijerdop Put) of the Farm Eyerdop Pan 58; and Portion 4 (a portion of Portion 2 – Rooipan) of the Farm Eyerdop Pan 58
Application area (Ha)	20 956.7984 Ha
Magisterial district:	Prieska
Distance and direction from nearest town	The application area is situated approximately 10km south-west of the town of Marydale and approximately 60km north-west of the town of Prieska in the Northern Cape Province. Access to the site can be obtained from a secondary road turning south from the town of Marydale or via a

	secondary road turning west from the N10 between Marydale and Prieska.
21 digit Surveyor General Code for each farm portion	C06000000000005800001 C06000000000005800002 C06000000000005800003 C06000000000005800004

c) Locality Map:

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

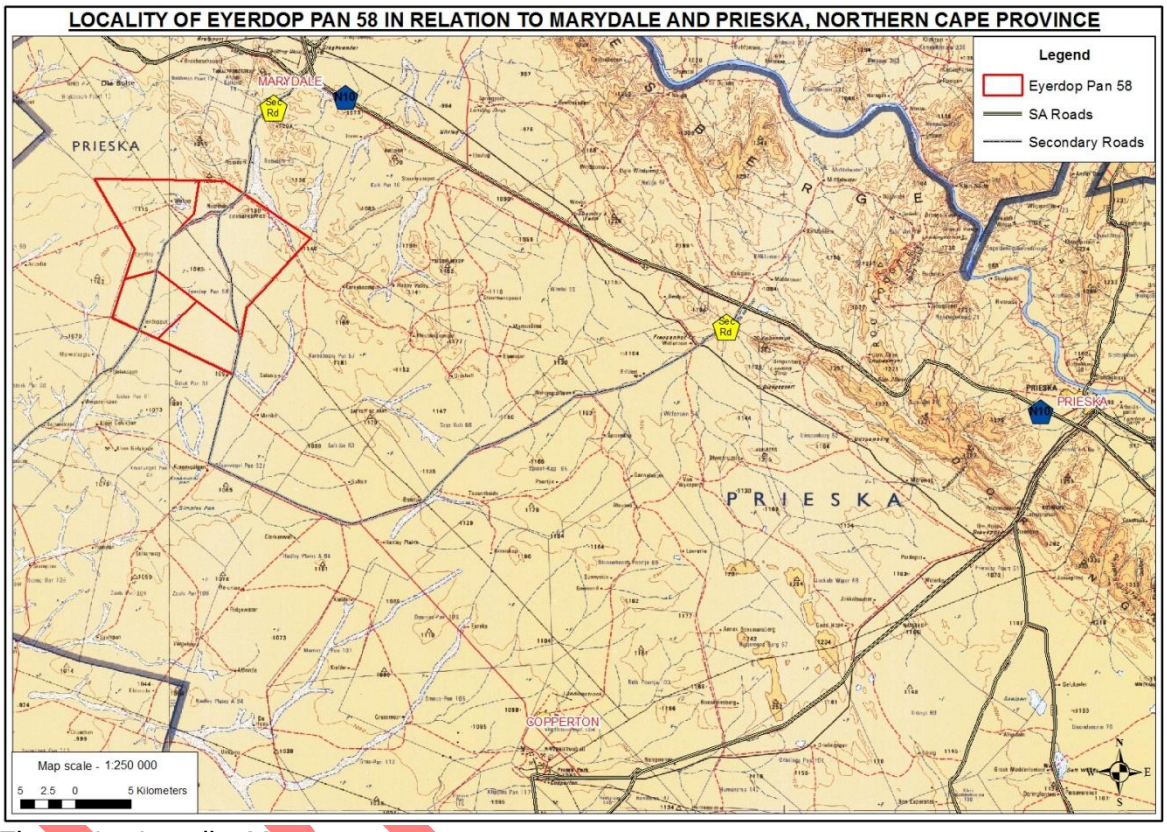


Figure 1 – Locality Map

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)

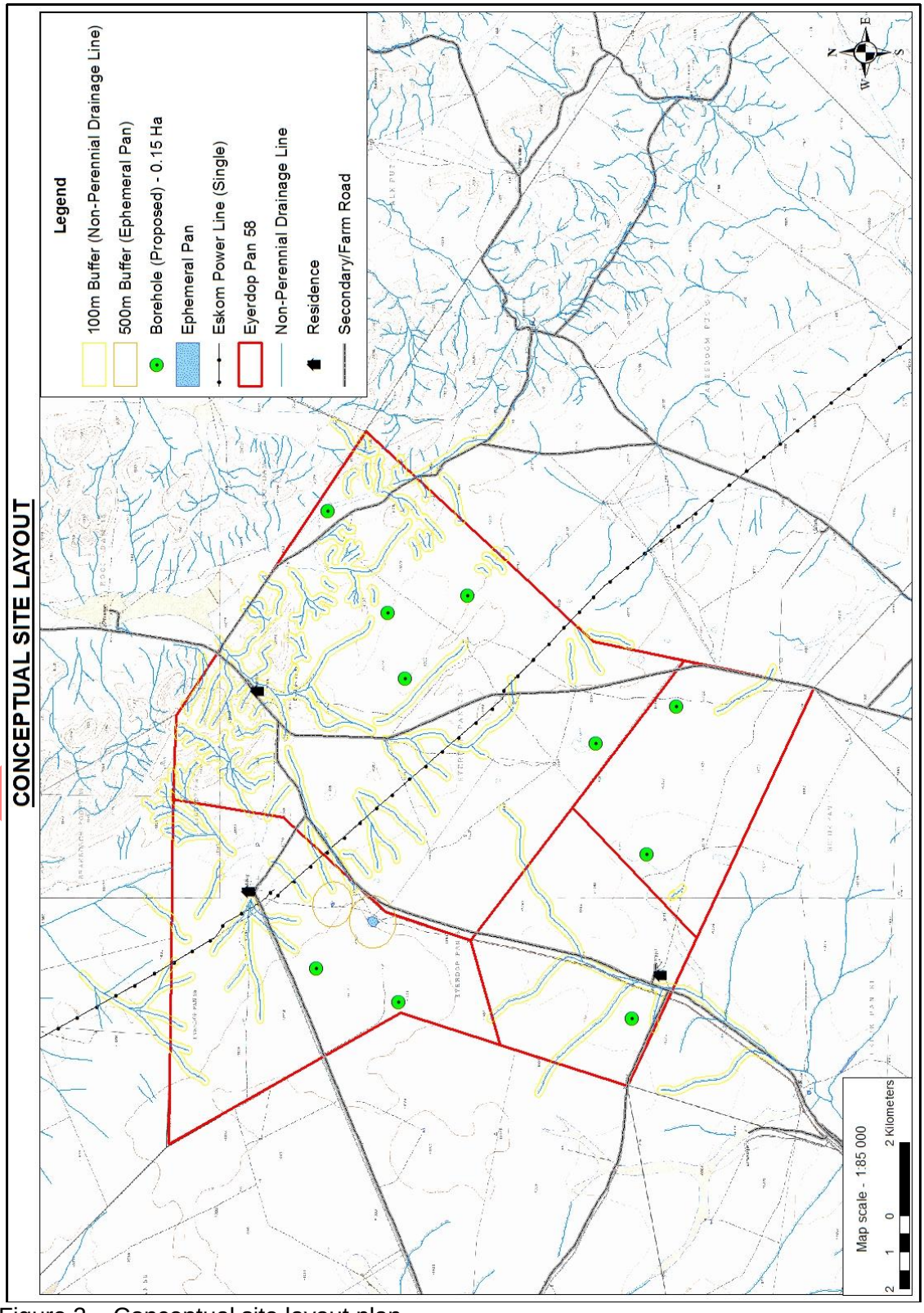


Figure 2 – Conceptual site layout plan

The exploration programme will be phased over a period of five years.

Prospecting Work:

- Compile a working plan on a scale of 1:10,000, which would integrate all geological, geophysical and geochemical data, as well as farm tracks, fences and drainages, to cover the relevant portion of the prospect area.
- Geological mapping of a zone covering the approximate position of the paleo seafloor setting.
- Ground EM surveys to detect any conductors.
- Reconnaissance soil sampling traverses followed by more detailed and systematic soil sampling.
- Diamond and reverse circulation drilling to test the conductors and soil geochemical anomalies at depth (20m to 750m). If economic grades of base metals are intersected, follow-up exploration boreholes will be drilled to delineating the economic zones. An initial 10 holes are planned to a maximum depth of 750m for the first exploration phase.
- If an economic deposit is discovered, resource drilling, a mineral resource estimation, and feasibility studies will be done to determine whether the deposit is economically viable.
- The eventual extent of an orebody, if one exists, will determine the number of boreholes to be drilled.
- The site clearance for drill rigs will be kept to a minimum and provision is made for a 10m x 15m 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.

Geochemical Surveys:

- It is expected that more than 5 000 soil samples may be collected on traverse lines and analysed using a hand-held XRF and laboratory analysis.

Geophysical Surveys:

- The area will be flown with airborne EM system which has been used with great success on the other areas. Target areas will then be followed up with ground EM surveys to determine dip and depth of targets. These surveys will both be outsourced.

Prospecting Methods:

- It is not intended to carry out any excavations, trenching or pitting on the prospect area for the duration of the prospecting right applied for.
- No bulk sampling is planned. If at the end of this prospecting period an orebody of economic tonnage and grades should be proven, an extension of the prospecting right will be applied for, for the purpose of bulk sampling and testing. In the event of an economic orebody being proven or indicated well before the end of the prospecting period, an amended work programme will be submitted to the DMR for approval.
- Drilling is the only invasive prospecting methods planned.

No infrastructure (i.e. offices and storerooms) will be established at the site as Orion Exploration No. 4 (Pty) Ltd (hereinafter referred to as ‘Orion’) shall make use of facilities in the town of Prieska.

	Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed)
1	Chemical toilets	2m x 3m = 6m² each		
2	Roads: Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the operation will create 500m of two-spoor tracks for the drilling rig to gain access to the drilling sites.	500m x 3m wide = 1 500m² = 0.15 Ha	X	GNR327: Activity 20 GNR327: Activity 27
3	Diamond and/or reverse circulation boreholes: 10 x Exploration holes Provision is made for a surface disturbance of 10m x 15m for each drill site.	10 boreholes x 10m x 15m = 1 500m² = 0.15 Ha	X	GNR327: Activity 20 GNR327: Activity 27

Full description of listed activities applied for:

Full description of listed activities:

- 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
  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);
  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.

- 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:-
  (i) the undertaking of a linear activity; or
  (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

(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.)

Orion's prospecting activities for various minerals will be phased over a period of five years.

Prospecting Work:

- Compile a working plan on a scale of 1:10,000, which would integrate all geological, geophysical and geochemical data, as well as farm tracks, fences and drainages, to cover the relevant portion of the prospect area.
- Geological mapping of a zone covering the approximate position of the paleo seafloor setting.
- Ground EM surveys to detect any conductors.
- Reconnaissance soil sampling traverses followed by more detailed and systematic soil sampling.
- Diamond and reverse circulation drilling to test the conductors and soil geochemical anomalies at depth (20m to 750m). If economic grades of base metals are intersected, follow-up boreholes will be drilled to delineating the economic zones. An initial 10 holes are planned to a maximum depth of 750m for the first exploration phase.
- If an economic deposit is discovered, resource drilling, a mineral resource estimation, and feasibility studies will be done to determine whether the deposit is economically viable.
- The eventual extent of an orebody, if one exists, will determine the number of boreholes to be drilled.
- The site clearance for drill rigs will be kept to a minimum and provision is made for a 10m x 15m 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.

Geochemical Surveys:

- It is expected that more than 5 000 soil samples may be collected on traverse lines and analysed using a hand-held XRF and laboratory analysis.

Geophysical Surveys:

- The area will be flown with airborne EM system which has been used with great success on the other areas. Target areas will then be followed up with ground EM surveys to determine dip and depth of targets. These surveys will both be outsourced.

Prospecting Methods:

- It is not intended to carry out any excavations, trenching or pitting on the prospect area for the duration of the prospecting right applied for.
- No bulk sampling is planned. If at the end of this prospecting period an orebody of economic tonnage and grades should be proven, an extension of the prospecting right will be applied for, for the purpose of bulk sampling and testing. In the event of an economic orebody being proven or indicated well before the end of the prospecting period, an amended work programme will be submitted to the DMR for approval.
- Drilling is the only invasive prospecting methods planned.

e) Policy and Legislative Context:

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations	- Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right
Environment Conservation Act (Act 73 of 1989) and Regulations	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities. - Section 28A: Exemptions.
Fencing Act (Act 31 of 1963)	- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.
Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.
Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment

	and to institute such measures to demonstrate such care. - Regulations GN R547, published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal) - Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption) - Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)
National Environmental Management: Air Quality Act (Act 39 of 2004)	- Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations. Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007

	Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List fo Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa‟s natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.
National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles)

	- Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste mangment activities list published under GN921)
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA
National Water Act (Act 36 of 1998) and and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse;

	(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.
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	- Section 8: General duties of employers to their employees. - Section 9: General duties of employers and self-employed persons to persons other than their employees.
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 spaitial planning and land use management in

(SPLUMA) and regulations	the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects
Community Development (Act 3 of 1966)	- To promote community development
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development
Development Facilitation (GN24, PG329, 24/07/1998)	- Regulations re Northern Cape LDO's
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like; - Agriculture, land survey S10
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)
Municipal Ordinance, 20/1974	- To control pollution, sewers etc.
Municipal Ordinance, PN955, 29/08/1975	- Nature conservation Regulations
Cape Land Use Planning Ordinance, 15/85	- To control land use planning
Cape Land Use Planning Ordinance, PN1050, 05/12/1988	- Land use planning Regulations

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 reserves. In order to ascertain the above and determine the nature, locality and extent of the mineral reserves 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 prospecting project prove successful in the application area, Orion plans to provide employment opportunities and support to the local business sector during the operational phases.

Orion expects that substantial benefits from the project (should the prospecting project prove successful) 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.

Further to the above and with reference to the Pixley Ka Seme District Municipality's Integrated Development Plan, it has been determined that there is little data on the extent of mineral reserves in the district. The undertaking of exploration is a costly and complex business. As such the IDP proposes that a detailed marketing plan is put together to attract exploration investment to the district and to aggressively market the district as an investment target in the mining sector. Orion's proposed prospecting activities shall directly contribute to the requirements as set out in the PKSDM's IDP.

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:
  Orion 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 diamond and/or reverse circulation drill rig are planned to be used. 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 considereation 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:

Farm Name	Title Deed	In Extent
Portion 1 (Neeldale) of the Farm Eyerdop Pan 58	T12349/1989CTN	9 141.9216 Ha
Remaining Extent of Portion 2 (Witkop) of the Farm Eyerdop Pan 58	T78507/1997CTN	4 902.4123 Ha
Portion 3 (a portion of Portion 2 – Eijerdop Put) of the Farm Eyerdop Pan 58	T2407/2001CTN	3 416.2550 Ha
Portion 4 (a portion of Portion 2 – Rooipan) of the Farm Eyerdop Pan 58	T2407/2001CTN	3 496.2095 Ha

Alternatives considered:-
Orion has considered the following aspects in the general Regional setting:

- 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, Orion opted to apply for the properties as listed above.

(b) The type of activity to be undertaken:

The only invasive exploration activity that will take place is diamond and/or reverse circulation drilling boreholes.

Alternatives considered:-
The only alternative land use is livestock and game farming; however Orion'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 infrastructure (i.e. offices and storerooms) will be established at the site as Orion shall make use of facilities in the town of Prieska.

Invasive prospecting: The proposed locality of the first phase 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 geophysical surveys have been completed.

Alternatives considered:-
Infrastructure: The only alternative considered was the establishment of offices and storerooms on application area. As Orion 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 application area was considered, but taking into account that Orion 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 diamond and/or reverse circulation drill rig will be used.

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:

Orion 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:-
Orion considered conducting bulk sampling as part of its prospecting activities. To ensure the prospecting activities are cost effective, Orion 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 surface owners of the properties under application, surrounding landowners and various other identified interested and affected parties were notified of the proposed prospecting activity by means of registered post, with a draft Basic Assessment Report (hereinafter referred to as 'BAR') attached thereto.

Any other interested and / or affected party was also invited to register as such in advertisements that were placed in the Oewernuus (Local newspaper) and Volksblad (Regional newspaper). A notice board was also placed at the site. Attached as Appendix '5' find hereto proof of the notification process.

Responses received:

Refer to Appendix '6' for all responses received to the notification letters.

Surface owners' consultation:

Meetings were held with the surface owners, on the … (refer to Appendix '7' for the attendance registers and meeting minutes). A draft copy of the Basic Assessment Report and Environmental Management Programme Report was provided to the surface owners for perusal and comment.

The content of the BAR & EMPR document was discussed during the meetings and the surface owners confirmed that they agree with the content of this document.

(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
AFFECTED PARTIES				
Landowner/s	X			
Ms. S.B.J. Hudson	X			
Flip van der Westhuizen Trust	X			
Boegoe Trust	X			
Lawful occupier/s of the land				
Not applicable. The surface owner occupies the land.				
Landowners or lawful occupiers on adjacent properties	X			
George Bishop Trust	X			
J. du Toit Trust	X			
Irene Familie Trust	X			
Mr. P.P. Kuhn	X			
Kareeboomput Testamentere Trust	X			
Mr. J.S. Maree	X			
Municipal Councillor	X			
Siyathemba Local Municipality	X	N/A	To date no comment has been received.	N/A
Municipality	X			
Pixley Ka Seme District Municipality	X	N/A	To date no comment has been received.	N/A
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA, etc.)				
Eskom	X	N/A	To date no comment has been received.	N/A
SANRAL	X	N/A	To date no comment has been received.	N/A
Transnet	X	N/A	To date no comment has been received.	N/A
Communities				
Not applicable: There are no communities in the immediate vicinity of the prospecting right application area.				

Department of Land Affairs				
Department: Rural Development and Land Affairs	X	N/A	To date no comment has been received.	N/A
Traditional Leaders				
Not applicable: There are no communities, with Traditional Leaders, in the immediate vicinity of the prospecting right application area.				
Department of Environmental Affairs				
The Department of Environmental Affairs is a competent authority in this Prospecting Right application process.				
Other Competent Authorities				
Department: Agriculture	X	N/A	To date no comment has been received from this Department.	N/A
Department: Water Affairs	X	N/A	To date no comment has been received from this Department.	N/A
Other Affected Parties				
Not applicable: No other parties responded to the notification process.				
Interested Parties				
Commission on Restitution of Land Rights	X	N/A	To date no comment has been received.	N/A
Rich Rewards Trading 437 (Pty) Ltd	X	N/A	To date no comment has been received.	N/A
SAHRA	X	N/A	To date no comment has been received.	N/A

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 properties. The general air quality on the properties is expected to be good.

  The wind rose for Marydale shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE).

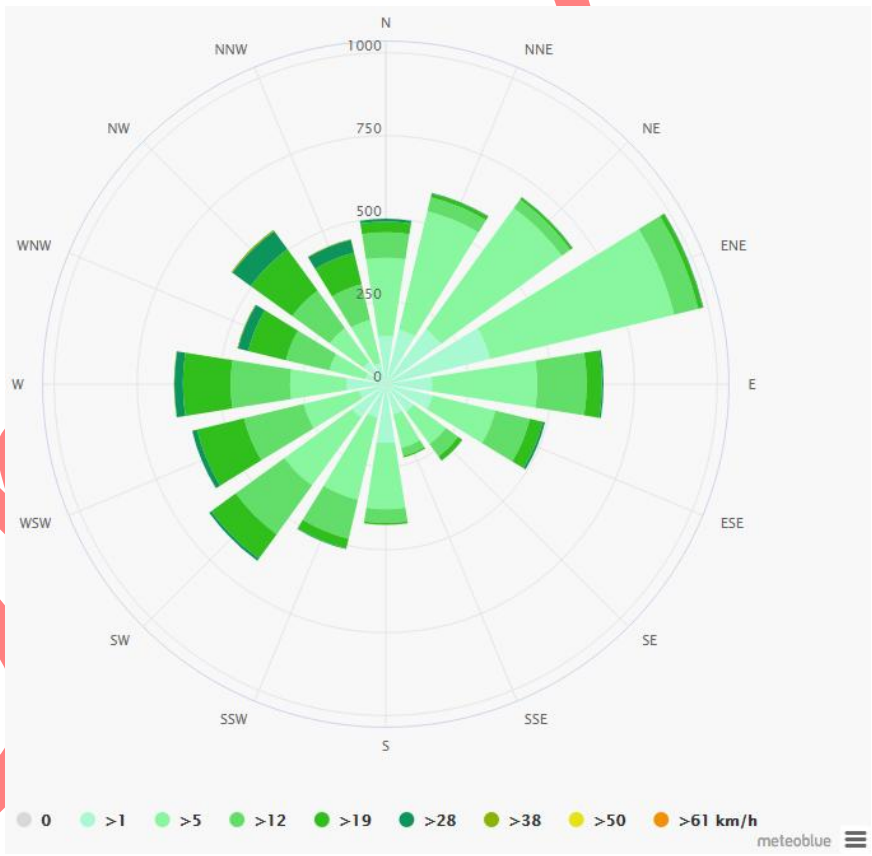


Figure 3 – Wind rose for Marydale area

The diagram for Marydale 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.

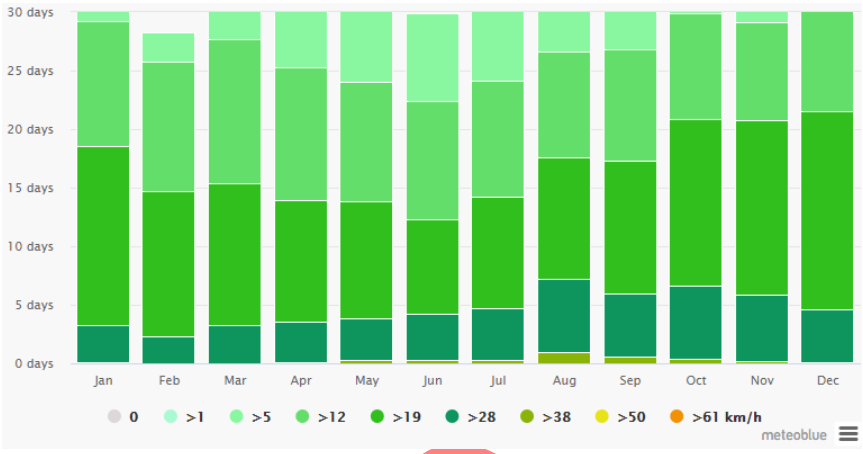


Figure 4 – Wind speed of the Marydale area

- **Archaeological, cultural & heritage environment:**
  The 'Screening Reports' obtained from the national web-based environmental screening tool, have been used to determine the environmental sensitivity of the application area.

  These reports list the Archaeological and Cultural Heritage sensitivity as follows:

Property	Sensitivity
Portion 1 (Neeldale) of the Farm Eyerdop Pan 58	Medium

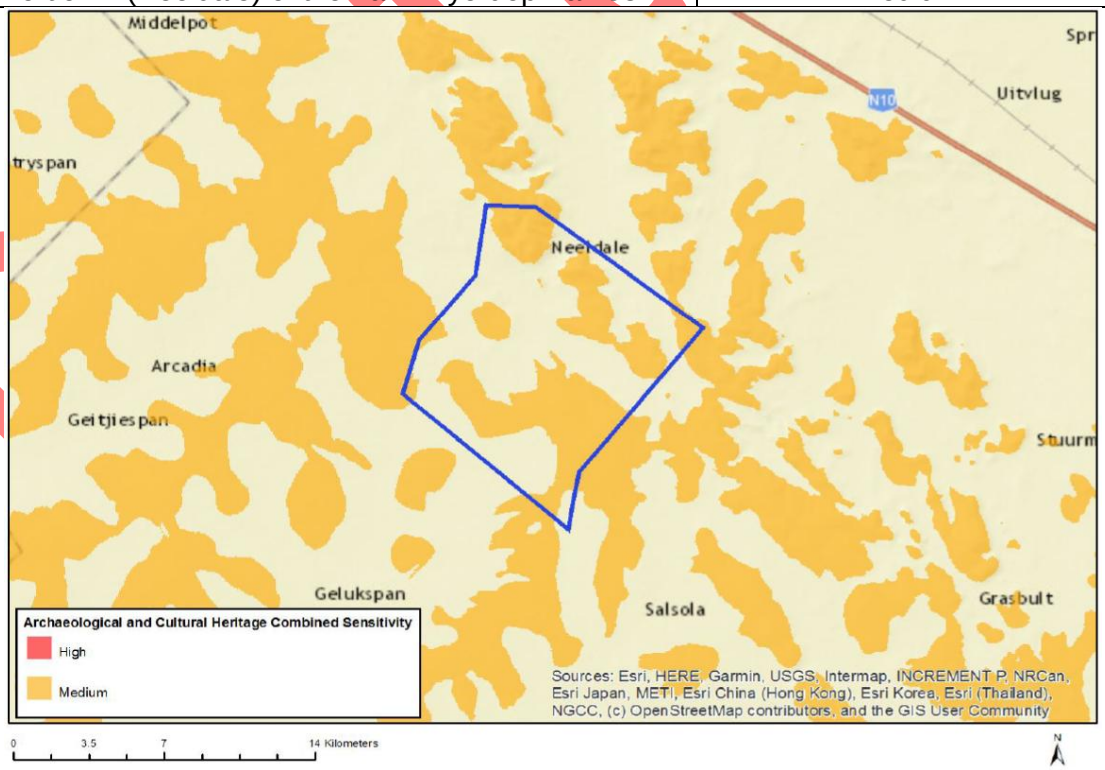


Figure 5a - Sensitivity of Portion 1(Neeldale) of the Farm Eyerdop Pan 58

Remaining Extent of Portion 2 (Witkop) of the Farm Eyerdop Pan 58	Medium

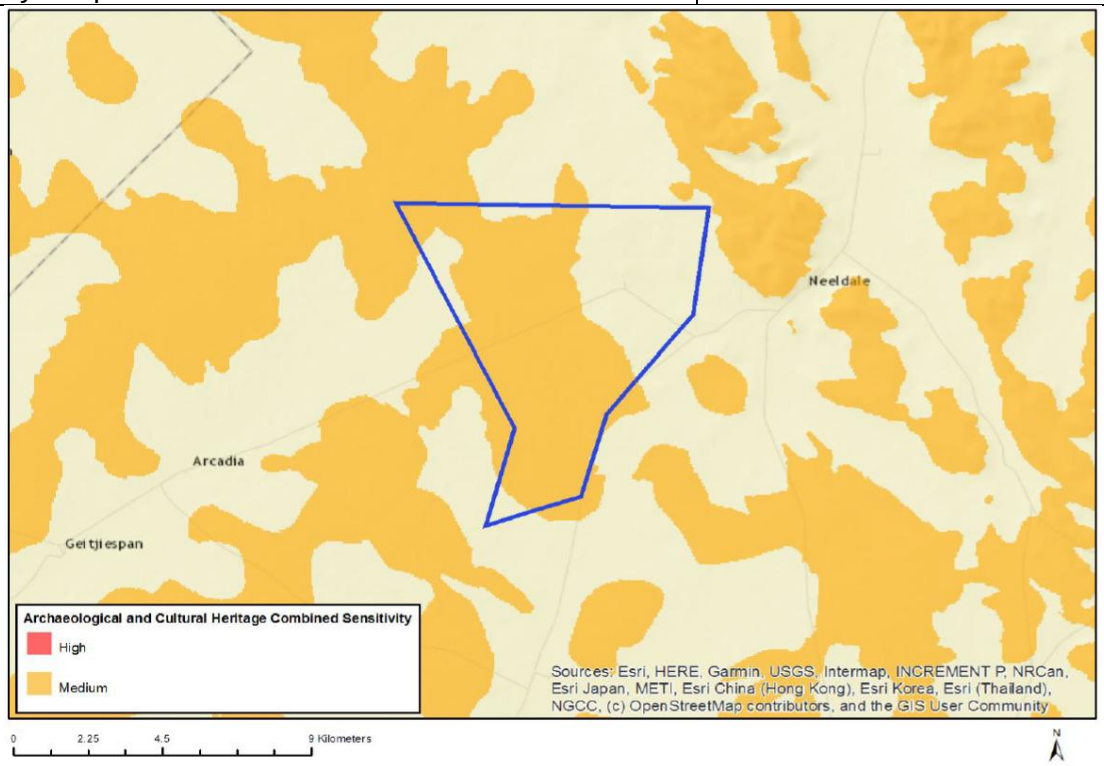


Figure 5b - Sensitivity of Remaining Extent of Portion 2 (Witkop) of the Farm Eyerdop Pan 58

Portion 3 (a portion of Portion 2 – Eijerdop Put) of the Farm Eyerdop Pan 58	Medium

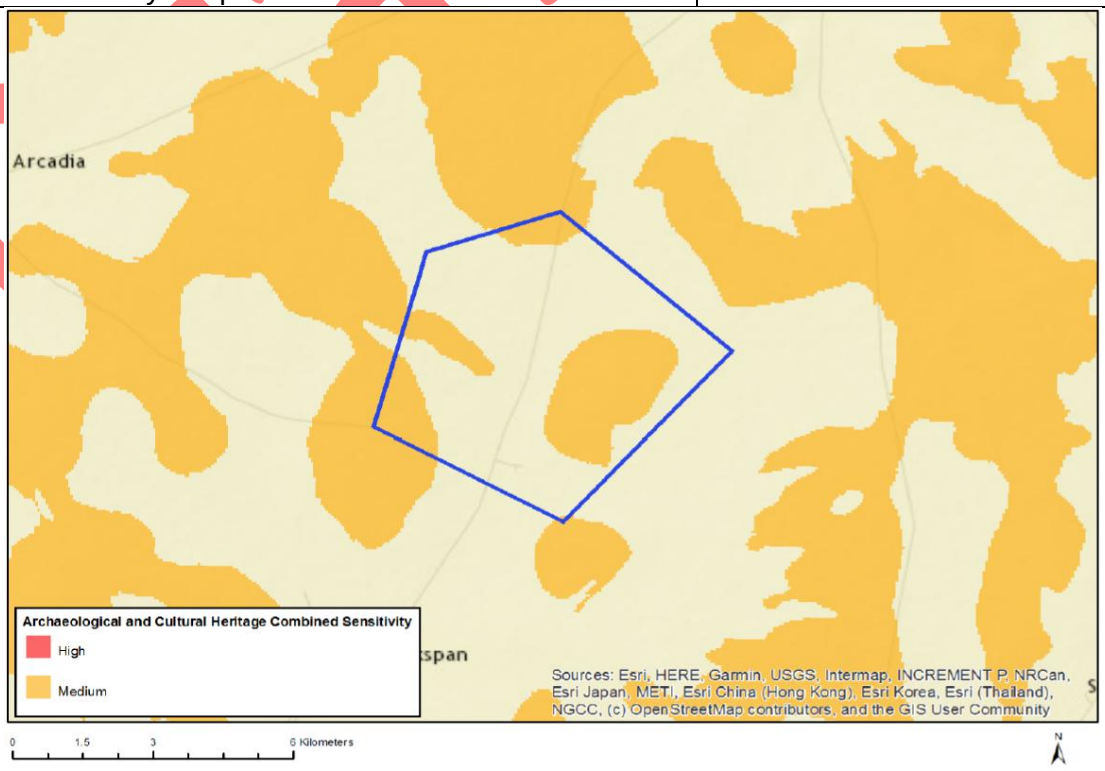


Figure 5c - Sensitivity of Portion 3 (a portion of Portion 2 – Eijerdop Put) of the Farm Eyerdop Pan 58

Portion 4 (a portion of Portion 2 – Rooipan) of the Farm Eyerdop Pan 58	Medium

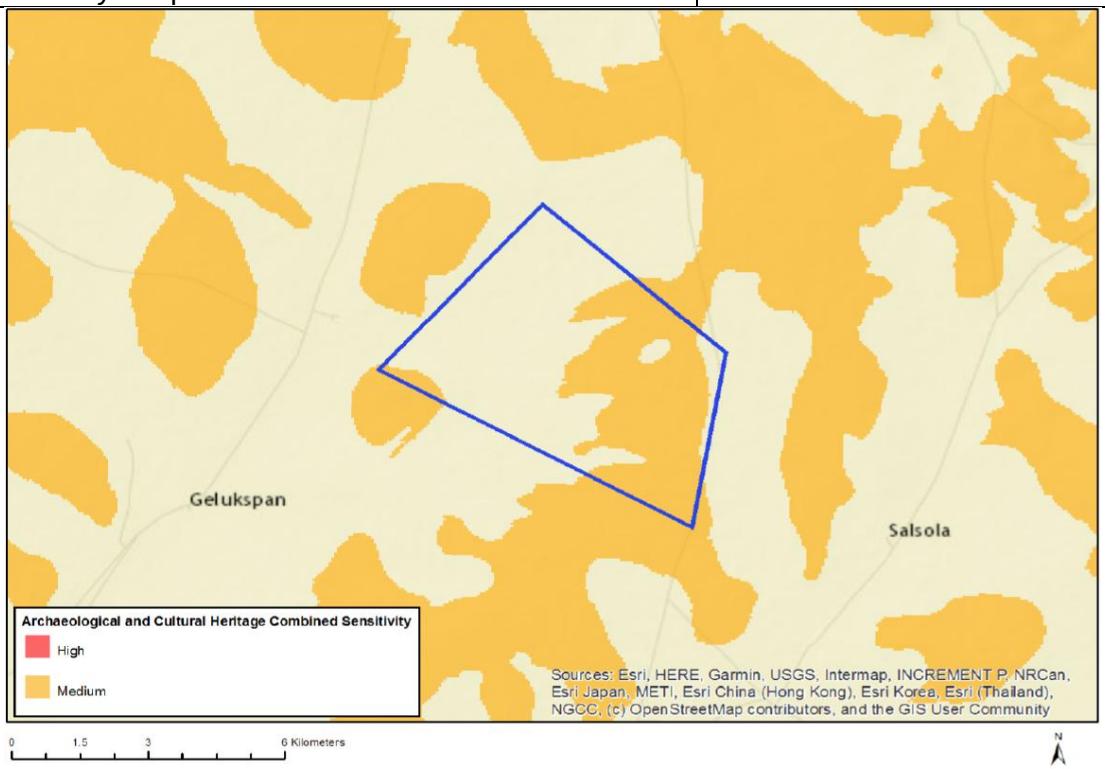


Figure 5d - Sensitivity of Portion 4 (a portion of Portion 2 – Rooipan) of the Farm Eyerdop Pan 58

An Archaeologist has been appointed to conduct a site visit and prepare an Archaeological and Cultural Heritage Impact Assessment. The findings of this report shall be included in the final BAR.

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

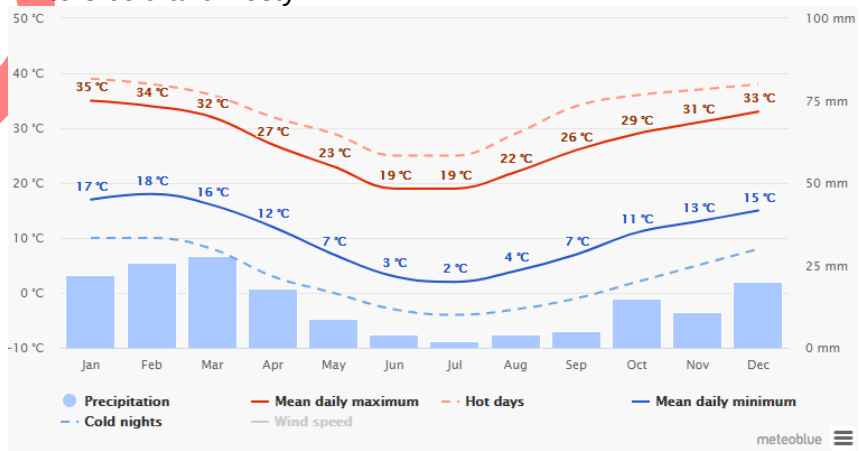


Figure 6 – Average temperatures and precipitation of the Marydale area

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Marydale. 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.

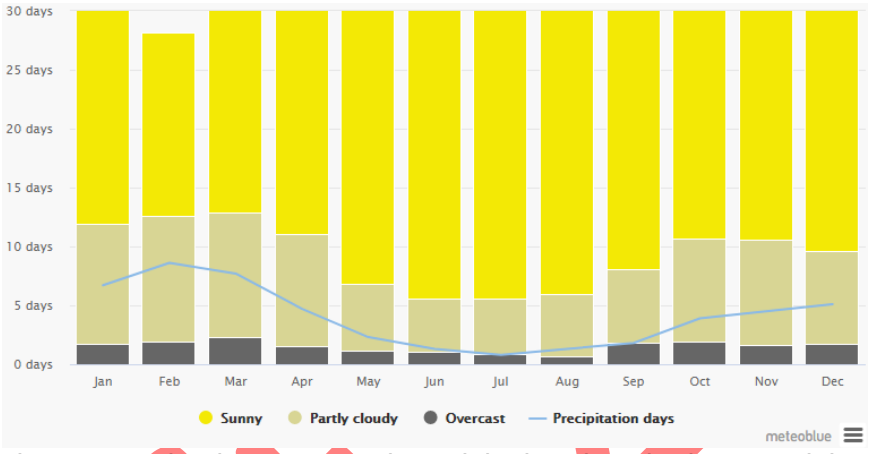


Figure 7 – Cloudy, sunny and precipitation days in the Marydale area

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.

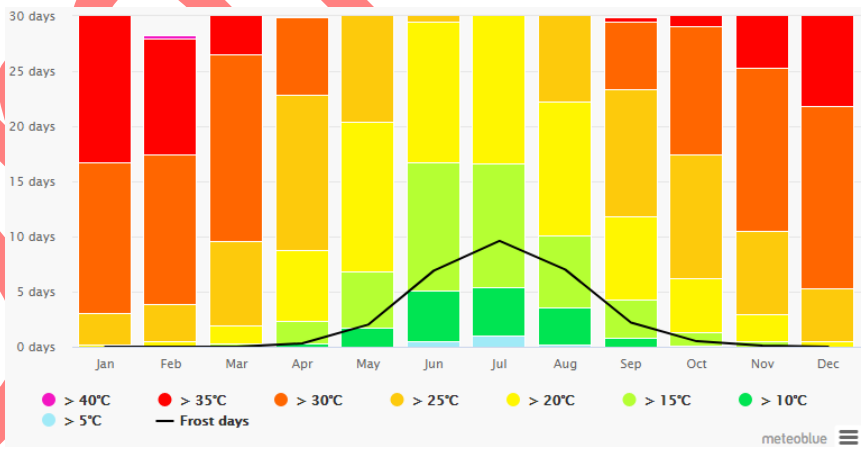


Figure 8 – Maximum temperatures in the Marydale area

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

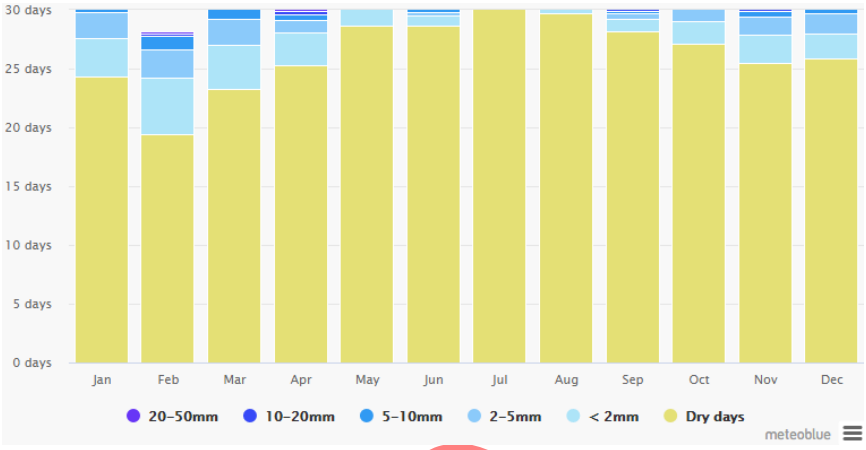


Figure 9 – Precipitation of the Marydale area

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

- **Fauna:**
  Animals likely to be found on the farms and surrounding environment include small mammals and birds that are associated with the Bushmanland Arid Grassland and Lower Gariep Broken Veld Vegetation Types. These include, amongst various others, small antelope, Black-backed Jackals, Caracal, snakes, Aardvark, Meerkat, Steenbok and Small Spotted Cats.

- **Flora:**
  The area under application falls within the Lower Gariep Broken Veld Vegetation type (NKb 1) and the Bushmanland Arid Grassland Vegetation type (NKb3), part of the Nama-Karoo Biome.

  The following is normally found under the Lower Gariep Broken Veld vegetation type:
  - Succulent Trees: *Aloe dichotoma* var. *dichotoma*.
  - Small Trees: *Acacia mellifera* subsp. *detinens* (d), *Commiphora gracilifrondosa*, *Ficus cordata*, *Pappea capensis*, *Rhus populifolia*, *Ziziphus mucronata* subsp. *mucronata*.
  - Tall Shrubs: *Rhigozum trichotomum* (d), *Adenolobus garipensis*, *Antherothamnus pearsonii*, *Cadaba aphylla*, *Caesalpinia bracteata*, *Ehretia rigida* subsp. *rigida*, *Nymania capensis*, *Rhigozum obovatum*, *Rhus burchellii*.
  - Epiphytic Semiparasitic Shrub: *Tapinanthus oleifolius*.
  - Succulent Shrubs: *Ceraria namaquensis*, *Cryptolepis decidua*, *Euphorbia avasmontana*, *E. gregaria*, *Kleinia longiflora*, *Lycium bosciifolium*, *Zygophyllum dregeanum*.
  - Woody Succulent Climber: *Sarcostemma viminale*.
  - Low Shrubs: *Blepharis mitrata* (d), *Aizoon schellenbergii*, *Aptosimum albomarginatum*, *A. lineare*, *A. marlothii*, *Barleria rigida*, *Berkheya spinosissma* subsp. *namaensis*, *Dyerophytum africanum*, *Hermannia spinosa*, *H. vestita*, *Hibiscus elliottiae*, *Indigofera heterotricha*, *Limeum aethiopicum*, *Lophiocarpus polystachyus*, *Monechma*

spartioides, *Phaeoptilum spinosum*, *Phyllanthus maderaspatensis*, *Polygala seminuda*, *Ptycholobium biflorum* subsp. *biflorum*, *Sericocoma avolans*, *Solanum capense*, *Stachys burchelliana*, *Talinum arnotii*, *Tetragonia arbuscula*, *Zygophyllum rigidum*.

- Semiparasitic Shrub: *Thesium lineatum*.
- Graminoids: *Aristida adscensionis* (d), *Enneapogon desvauxii* (d), *E. scaber* (d), *Eragrostis nindensis* (d), *Stipagrostis obtusa* (d), *S. uniplumis* (d), *Aristida congesta*, *A. engleri*, *Cenchrus ciliaris*, *Digitaria eriantha*, *Enneapogon cenchroides*, *Eragrostis annulata*, *E. lehmanniana*, *E. porosa*, *Schmidtia kalahariensis*, Setaria verticillata, *Sporobolus fimbriatus*, *Stipagrostis anomala*, S. ciliata, *Tragus berteronianus*, *Triraphis ramosissima*.
- Herbs: *Forsskaolea candida* (d), *Acanthorpsis hoffmannseggiana*, *Barleria lichtensteiniana*, *Chamaesyce glanduligera*, *Chascanum garipsense*, *Cleome angustifolia* subsp. *diandra*, *Codon royenii*, *Dicoma capensis*, *Garuleum schinzii*, *Rogeria longiflora*, *Sesamum capense*, *Tribulus zeyheri*, *Trichodesma africanum*.
- Succulent Herbs: *Orbea lutea* subsp. *lutea*, *Stapelia flavopurpurea*.

The following is normally found under the Bushmanland Arid Grassland vegetation type:

- Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *Enneapogon desvauxii* (d), *Eragrostis nindensis* (d), *Schmidtia kalahariensis* (d), *Stipagrostis ciliata* (d), *S. obtusa* (d), *Cenchrus ciliaris*, *Enneapogon scaber*, *Eragrostis annulata*, *E. porosa*, *E. procumbens*, *Panicumlanipes*, *Setaria verticillata*, *Sporobolus nervosus*, *Stipagrostis brevifolia*, *S. uniplumis*, *Tragus berteronianus*, *T. racemosus*.
- Small Trees: *Acacia mellifera* subsp. *detinens*, *Boscia foetida* subsp. *Foetida*.
- Tall Shrubs: *Lycium cinereum* (d), *Rhigozum trichotomum* (d), *Cadaba aphylla*, *Parkinsonia africana*.
- Low Shrubs: *Aptosimum spinescens* (d), *Hermannia spinosa* (d), *Pentzia spinescens* (d), *Aizoon asbesstinum*, *A. schellenbergii*, *Aptosimum elongatum*, *A. lineare*, *A. morlothii*, *Barleria rigida*, *Berkheya annectens*, *Blepharis mitrata*, *Eriocephalus ambiguus*, *E. spinescens*, *Limeum aethiopicum*, *Lophiocarpus polystachyus*, *Monechma incanum*, *M. spartioides*, *Pentzia pinnatisecta*, *Phaeoptilum spinosum*, *Polygala seminude*, *Pteronia leucoclada*, *P. mucronata*, *P. sordid*, *Rosenia humilis*, *Senecio niveus*, *Sericocoma avolans*, *Solanum capense*, *Talinum arnotii*, *Tetragonia arbuscula*, *Zygophyllum microphyllum*.
- Succulent Shrubs: *Kleinia longiflora*, *Lycium bosciifolium*, *Salsola tuberculata*, *S. glabrescens*.
- Herbs: *Acanthopsis hoffmannseggiana*, *Aizoon canariense*, *Amaranthus praetermissus*, *Barleria lichtensteiniana*, *Chamaesyce inaequilatera*, *Dicoma capensis*, *Indigastrum argyraeum*, *Lotononis platycarpa*, *Sesamum capense*, *Tribulus pterophorus*, *T. terrestris*, *Vahlia capensis*.

- Succulent Herbs: *Gisekia pharnacioides*, *Psilocaulon coriarium*, *Trianthema parvifolia*.
- Herb: *Moraea venenata*.

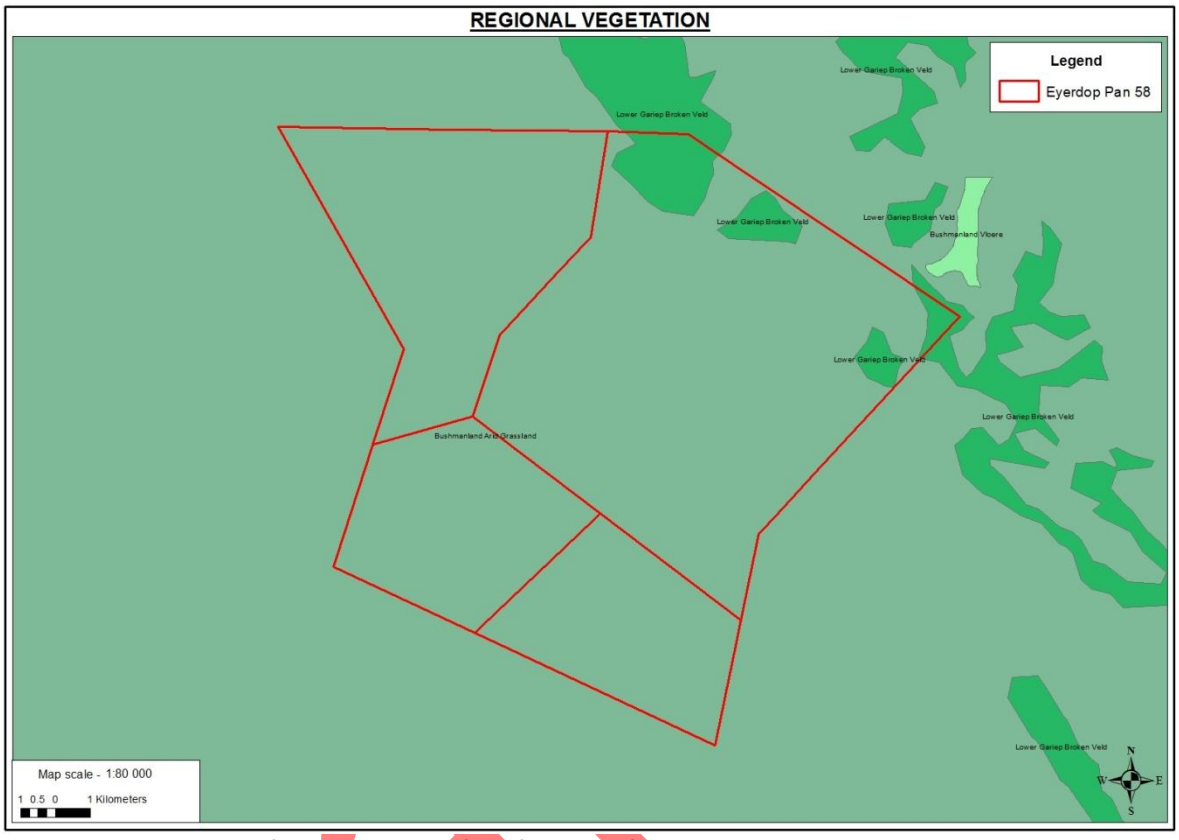


Figure 10 – Regional vegetation map

- **Geology:**

Eyerdop Pan 58 is partly underlain by rocks belonging to the Areachap Group. This Group hosts numerous volcanogenic massive sulphide deposits (VMS) in the surrounding area.

The Areachap Group belongs to the Namaqua-Natal Metamorphic Complex of the Northern Cape Province of South Africa. The mid-Proterozoic Areachap Group consists of various portions of amphibolites, quartzo-feldspathic gneiss, calc-silicate and politic schists (Geraghty et. al., 1996). The Areachap Group's importance lies in the base metal sulphide deposits within the 250 km outcrop length, and its fossil meta-island arc character (Geringer et. al., 1994). The figure below indicates the location of the known mineral deposits.

The approximately 1300 Ma old Areachap Group hosts a number of Cu–Zn type VMS deposits in different formations that display extensive polyphase deformation and upper amphibolite to granulite facies metamorphism (Theart et al., 1989). The formations in this group (Jannelspan, Boksputs and Copperton), probably formed as separate volcanic centres (Middleton, 1976; Geringer et al., 1994), but are time equivalents (Barton and Burger, 1983; Cornell et al., 1990; Rossouw, 2003).

The most important VHMS deposits are Prieska (47 Mt @ 1.7% Cu and 3.8% Zn), Areachap (8.9 Mt @ 0.4% Cu and 2.24% Zn) and Kantienpan (5 Mt @ 0.49% Cu and 4.09% Zn) (Rossouw, 2003).

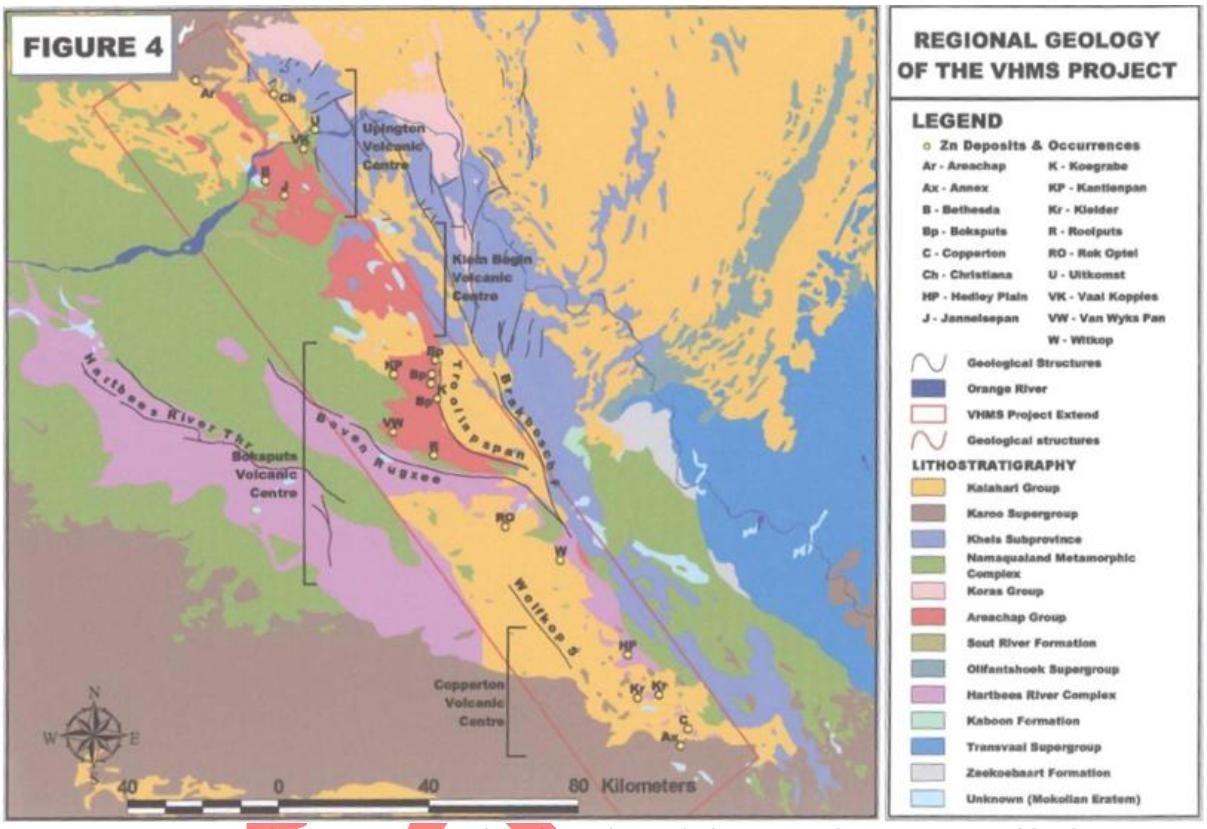


Figure 11 – Regional setting of the Areachap Group with the location of know mineralization

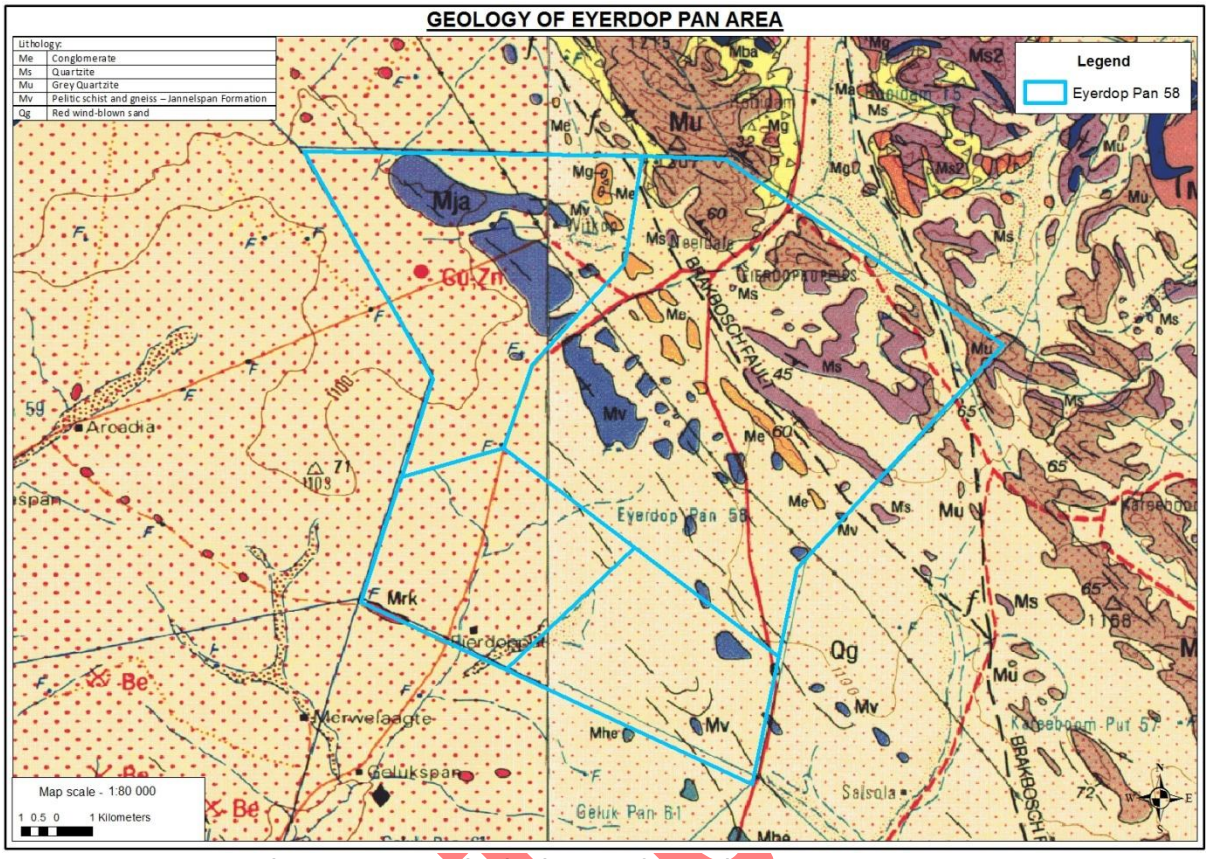


Figure 12 – Geological map of Eyerdop Pan Area

- **Groundwater:**
  The application area falls over three quaternary drainage regions, being D53A, D54G and D72C. The drainage regions form part of the Lower Orange Water Management Area (nr. 14 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 watering. The ground water quality is expected to be reasonable.

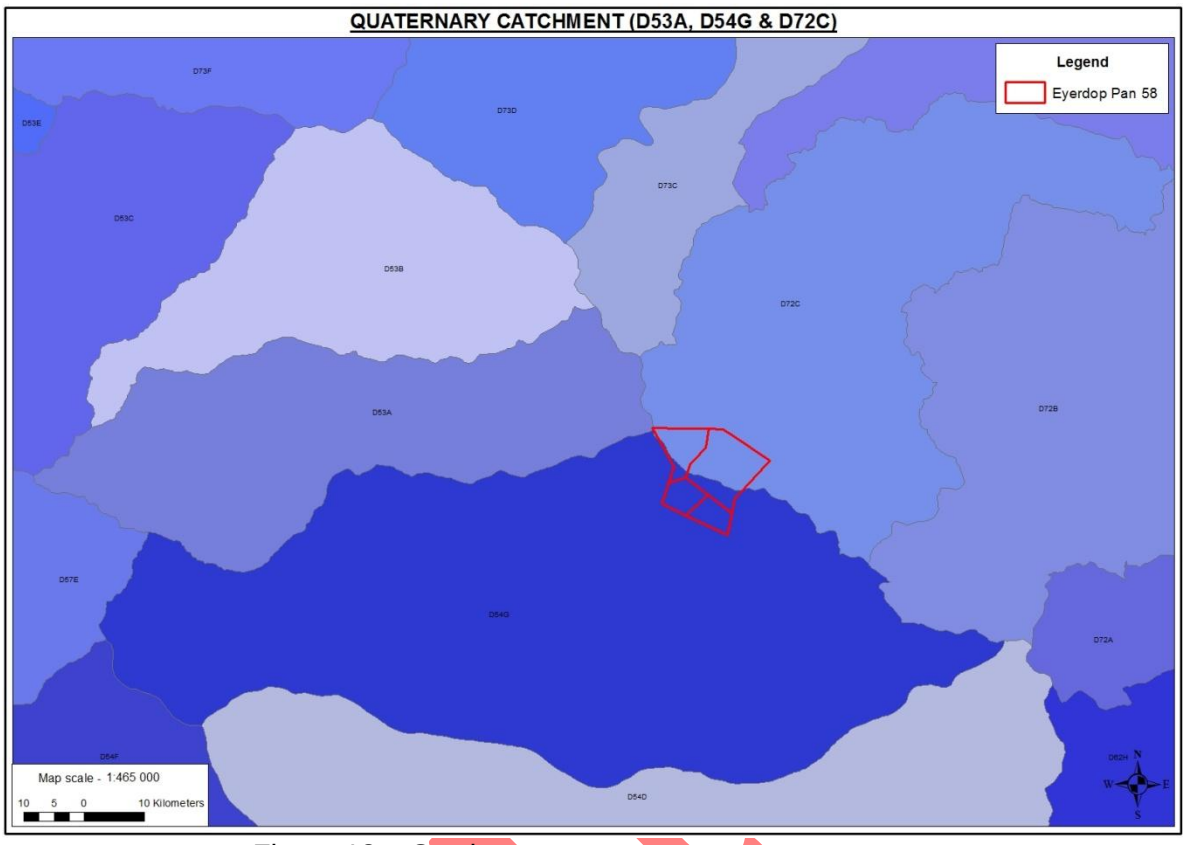


Figure 13 – Catchment map

- **Noise:**
  The only current source of noise is created from vehicles travelling on the gravel (farm) roads transecting the properties.

- **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

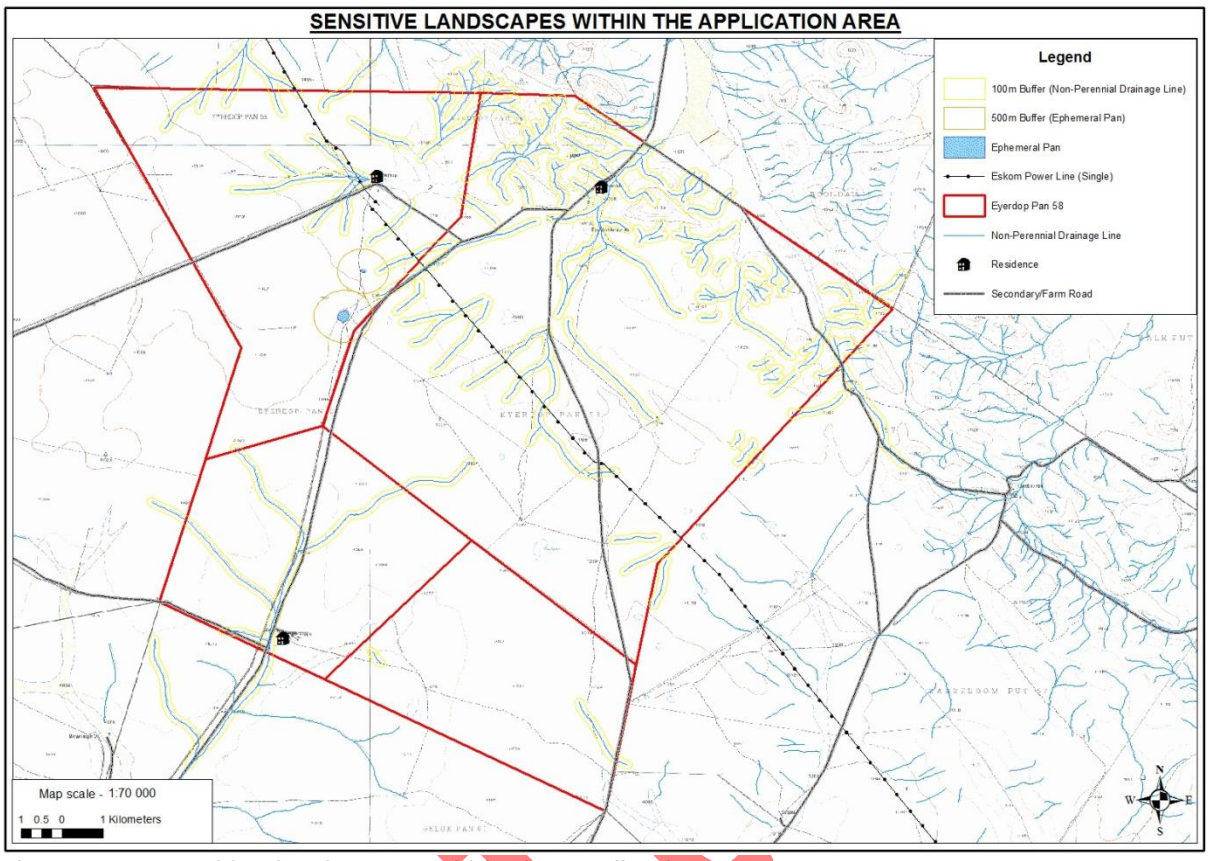


Figure 14 - Sensitive landscapes within the application area

Archaeological:
To be obtained from Archeological Report.

Environmental:
There are a number of non-perennial drainage lines, which traverses the application area. There are also a few small ephemeral pans in the application area. No prospecting will be allowed to be conducted within 100m from the non-perennial drainage lines or within 500m from the ephemeral pans.

- **Socio-Economic:**
  The farms under application are located within the Siyathemba Local Municipal Area, which falls under management of the Pixley Ka Seme District Municipality.

  According to the 2011 Census data the following is a description of the Socio-Economic environment for the municipal area:

  Siyathemba Local Municipality is a local municipality in the Pixley Ka Seme District Municipality in the Northern Cape Province of South Africa. Siyathemba Municipality is a Category B Municipality (NC077), established in 2001, in accordance with the demarcation process. The municipality is located within the central eastern parts of the Northern Cape Province on the banks of the Orange River, and falls within the boundaries of the Pixley Ka Seme District. The nearest business centre is Kimberley, which is about 220km away.

Siyathemba Municipality was initially made up of three entities, namely, Prieska, Marydale and Niekerkshoop. After demarcation the area was extended to include not only the towns and surrounding suburbs of Marydale, Niekerkshoop and Prieska but also Copperton. The municipal area encompasses a geographic area of approximately 8,200km², which implies that Siyathemba Municipality accounts for 8% of the total district surface area and approximately 3% of the provincial area. The municipality is divided into 4 Wards.

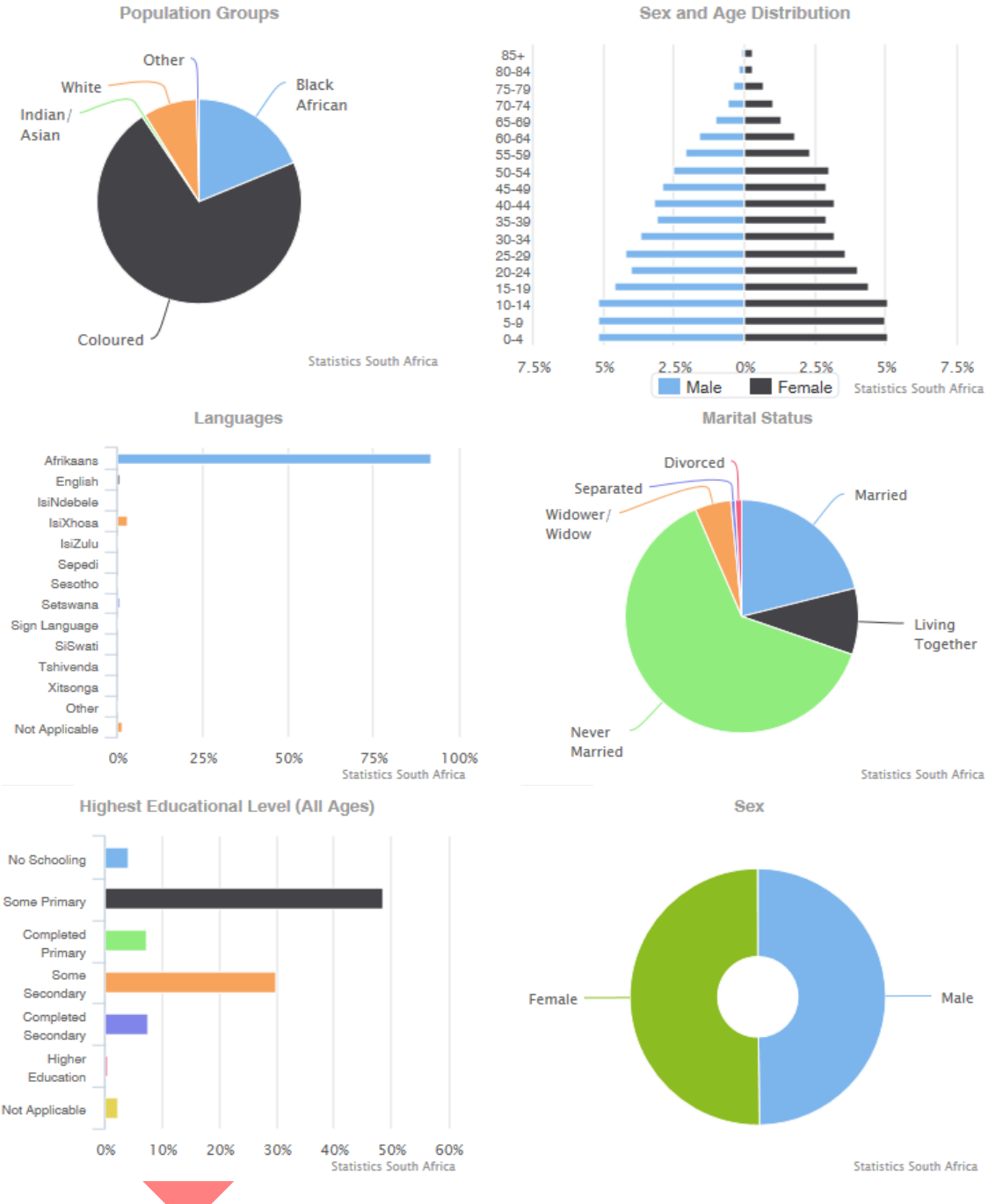
Key Statistics	2011
Total population	21,591
Young (0-14)	30,8%
Working Age (15-64)	63,2%
Elderly (65+)	6%
Dependency ratio	58,2
Sex ratio	99,3
Growth rate	1,57% (2001-2011)
Population density	1 persons/km2
Unemployment rate	24,3%
Youth unemployment rate	30,2%
No schooling aged 20+	11,5%
Higher education aged 20+	5,3%

Matric aged 20+	18%
Number of households	5,831
Number of Agricultural households	1,334
Average household size	3,6
Female headed households	36,1%
Formal dwellings	88,6%
Housing owned/paying off	54,3%
Flush toilet connected to sewerage	64,9%
Weekly refuse removal	73,9%
Piped water inside dwelling	43,1%
Electricity for lighting	86,2%

People:

The total population in the municipality is 21 591 people with Xhosa and Afrikaans being the dominant languages. The most dominant population group is coloured people; they represent 80% of the total population in the municipal area. The other groups are black African (12%) and white people (8%).

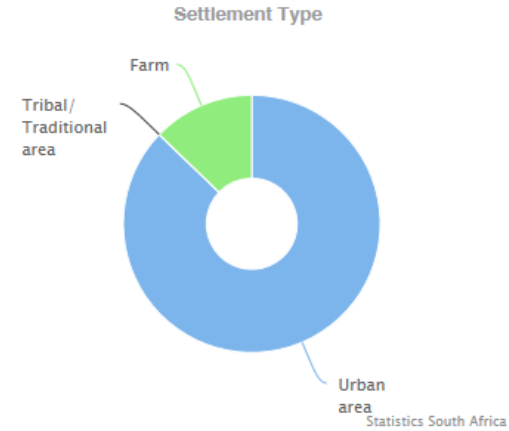
Afrikaans is the most widely spoken language (78%). There are an insignificant number of people who speak other languages. A total of 824 people indicated that IsiNdebele is their first language and 91 people speak Setswana.

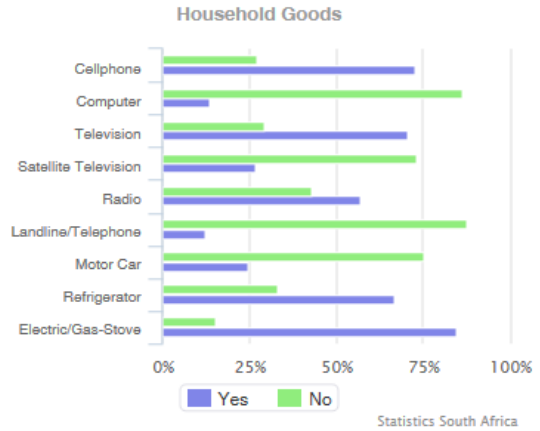


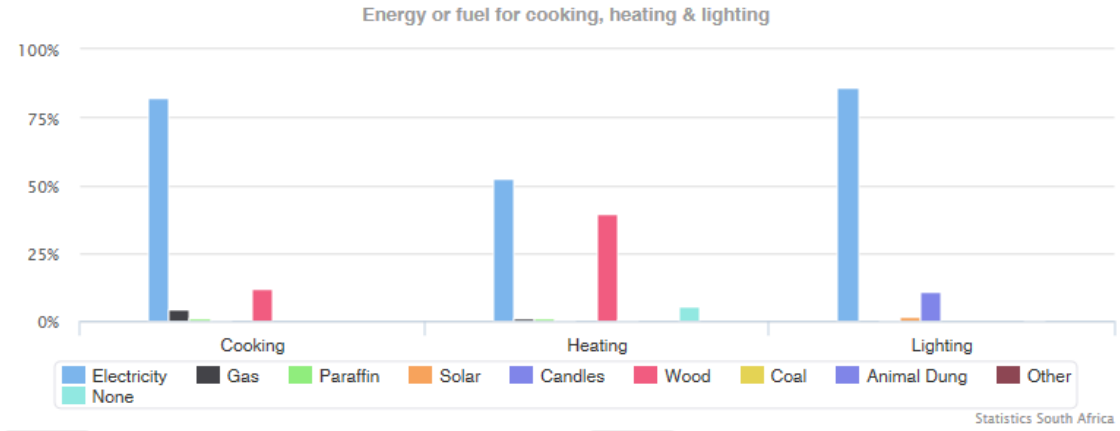
<u>Living conditions:</u>

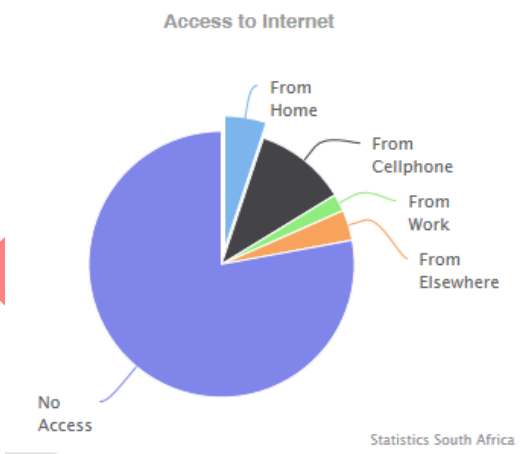
The educational profile in Siyathemba is that of 14% of the population had no schooling, while 34% had primary school education. Just 4% of the population has a degree or diploma. According to the 2011 census results:

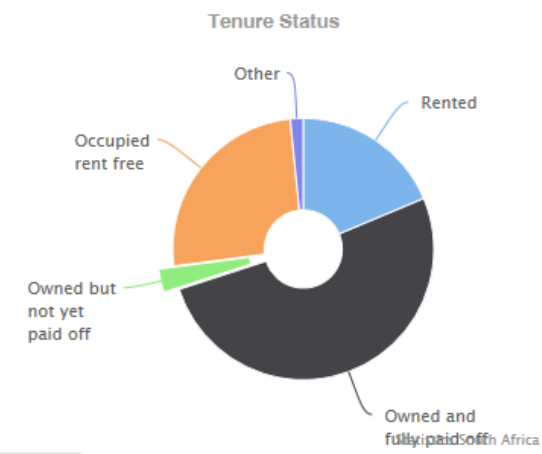
- 71.29% of people are using flush toilet.
- 74.88% access to refuse removal
- 97.46 % of people have access to piped water.

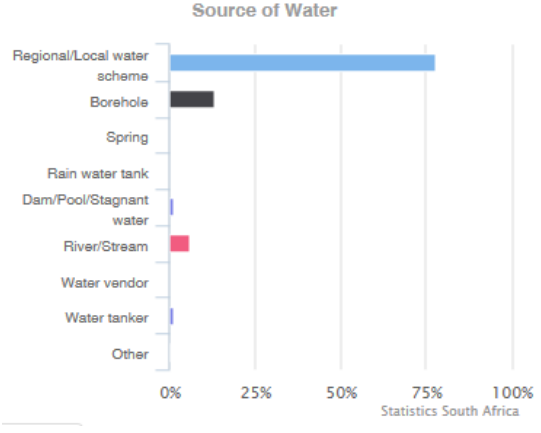

Settlement Type
Farm
Tribal/ Traditional area
Urban area
Statistics South Africa

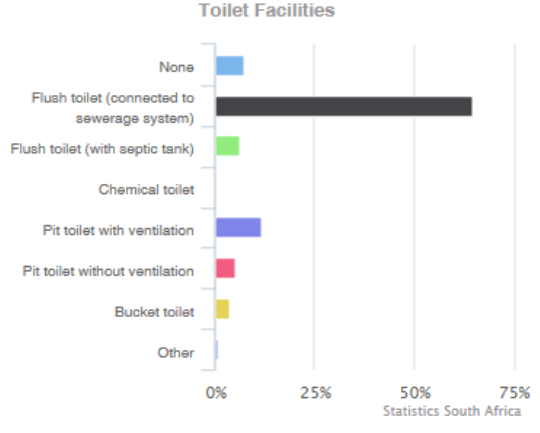

Household Goods
Cellphone
Computer
Television
Satellite Television
Radio
Landline/Telephone
Motor Car
Refrigerator
Electric/Gas-Stove
0%
25%
50%
75%
100%
Yes
No
Statistics South Africa

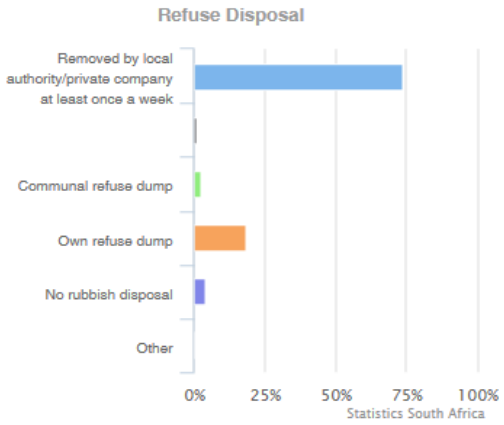

Energy or fuel for cooking, heating & lighting
100%
75%
50%
25%
0%
Cooking
Heating
Lighting
Electricity
Gas
Paraffin
Solar
Candles
Wood
Coal
Animal Dung
Other
None
Statistics South Africa


Access to Internet
From Home
From Cellphone
From Work
From Elsewhere
No Access
Statistics South Africa

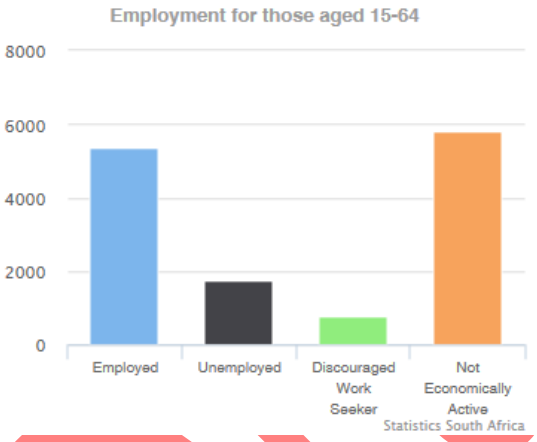

Tenure Status
Other
Rented
Occupied rent free
Owned but not yet paid off
Owned and fully paid off
Statistics South Africa

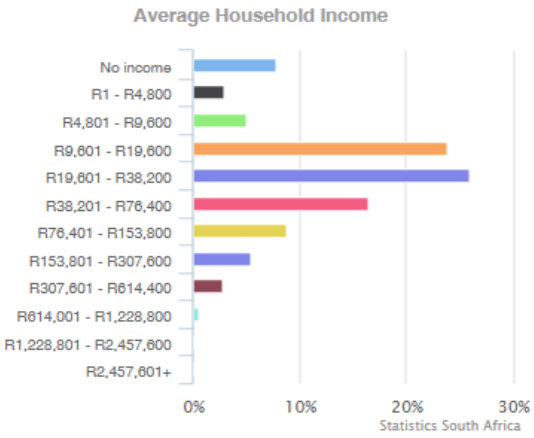

Source of Water
Regional/Local water scheme
Borehole
Spring
Rain water tank
Dam/Pool/Stagnant water
River/Stream
Water vendor
Water tanker
Other
0%
25%
50%
75%
100%
Statistics South Africa


Toilet Facilities
None
Flush toilet (connected to sewerage system)
Flush toilet (with septic tank)
Chemical toilet
Pit toilet with ventilation
Pit toilet without ventilation
Bucket toilet
Other
0%
25%
50%
75%
Statistics South Africa



Economy:
The whole of the Siyathemba area is rich in semiprecious stones. The famed 'tiger's eye' is one of many gems mined in the region. An opportunity exists for adding value to the raw material and shipping out processed products of high quality.





- **Soil:**

  The soils of the Lower Gariep Broken Veld vegetation type are shallow and skeletal (dominant soil forms are Mispah and Glenrosa), typical mainly of lb and lc land types, and to a lesser extent also of the Fb land type.

  The soils of most of the area in the Bushmanland Arid Grassland vegetation type are red-yellow apedal soils, freely drained, with a high base status and <300mm deep, with about one fifth of the area deeper than 300mm, typical of Ag and Ae land types.

- **Surface water:**

  There are a number of non-perennial drainage lines, which traverses the application area. There are also a few small ephemeral pans in the application area. No prospecting will be allowed to be conducted within 100m from the non-perennial drainage lines or within 500m from the ephemeral pans.

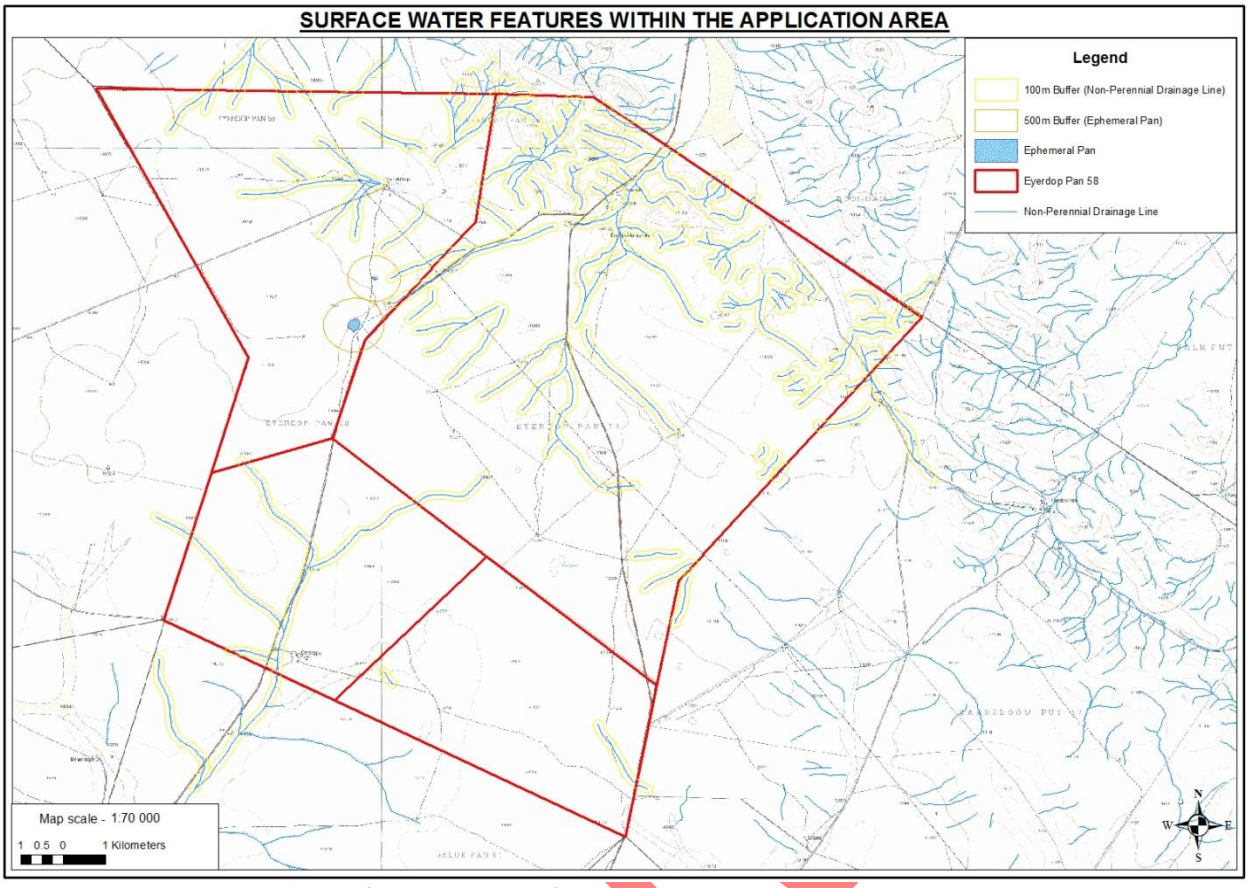


Figure 15 – Surface water map

- **Topography:**

The application area's altitude varies between 1050m and 1198 meters above sea level.

The landscape features for the areas located within the Lower Gariep Broken Veld Vegetation type can be described as follows: Hills and low mountains, slightly irregular plains but with some rugged terrain with sparse vegetation dominated by shrubs and dwarf shrubs, with annuals conspicuous, especially in spring, and perennial grasses and herbs. Groups of widely scattered low trees such as *Aloe dichotoma* var. *dichotoma* and *Acacia mellifera* subsp. *detinens* occur on slopes of koppies and on sandy soils of foot slopes respectively.

The landscape features for the areas located within the Bushmanland Arid Grassland Vegetation type can be described as follows: Extensive to irregular plains on a slightly sloping plateau sparsely vegetated by grassland dominated by white grasses (*Stipagrostis* species) giving this vegetation type the character of semidesert 'steppe'. In places low shrubs of *Salsola* change the vegetation structure. In years of abundant rainfall rich displays of annual herbs can be expected.

(b) Description of the current land uses.

The properties under application are currently utilized by the surface owners for livestock 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 road accessing the farms is in a reasonable condition.
  - There are residences on the farms.
  - There are only a few windmills and relating agricultural infrastructure.
  - There is an Eskom power line that traverses the application area.

- Environmental:
  There are a number of non-perennial drainage lines, which traverses the application area. There are also a few small ephemeral pans in the application area. No prospecting will be allowed to be conducted within 100m from the non-perennial drainage lines or within 500m from the ephemeral pans.

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

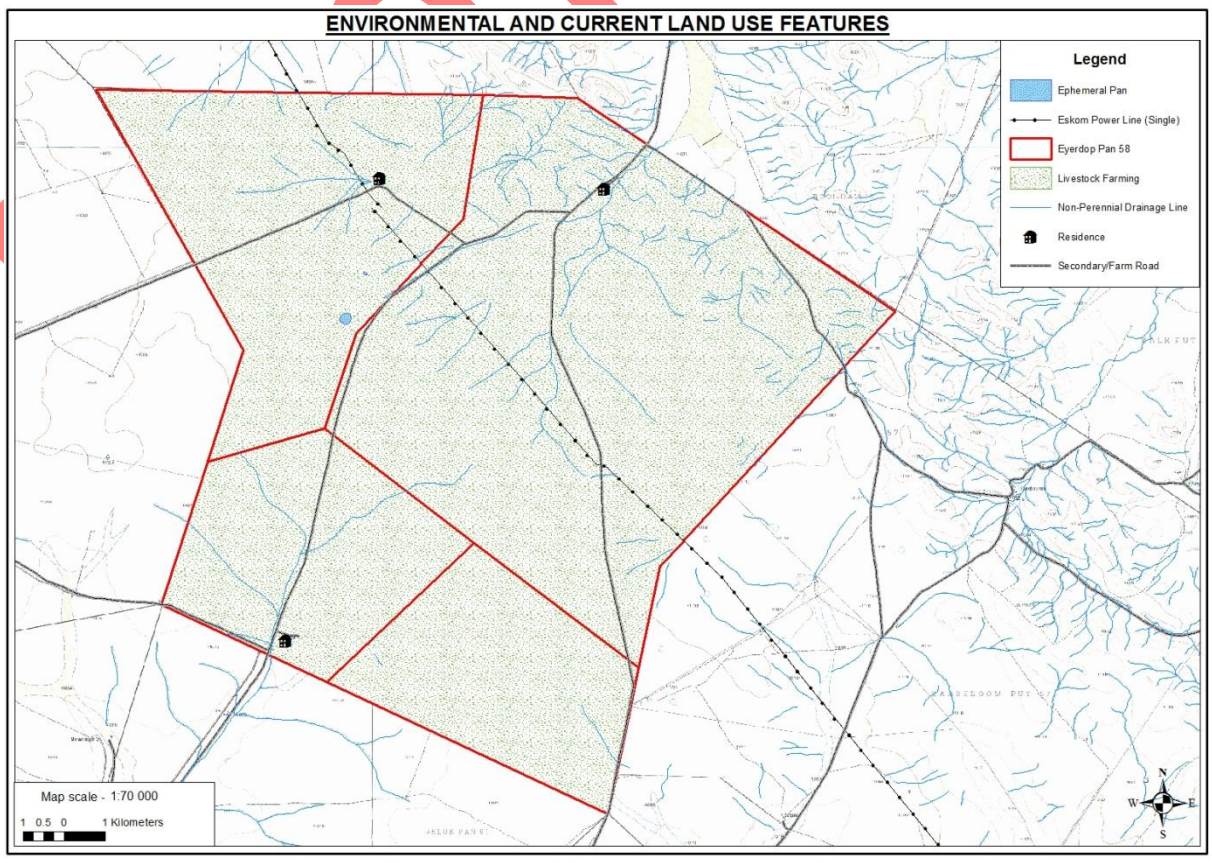


Figure 16 – Current land use and environmental map

(v) Impacts identified:

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

Prospecting activity	Impact on	Extent	Duration	Intensity	Probability	Significance (without mitigation)
Access Tracks	Air quality	Site	Short	Low	Definite	Low
	Fauna	Local	Long	Medium	Definite	Medium
	Flora	Local	Long	High	Definite	High
	Groundwater	Site	Short	Low	Improbable	Low
	Noise	Site	Short	Low	Definite	Low
	Soil	Local	Medium	Low	Definite	Low
	Surface water	N/A	N/A	N/A	N/A	N/A
	Topography	N/A	N/A	N/A	N/A	N/A
	Visual	Site	Medium	Low	Definite	Low

Prospecting activity	Impact on	Extent	Duration	Intensity	Probability	Significance (without mitigation)
Drilling activities	Air quality	Site	Short	Low	Definite	Low
	Fauna	Local	Long	Medium	Definite	Medium
	Flora	Local	Long	High	Definite	High
	Groundwater	Site	Short	Low	Improbable	Very Low
	Noise	Site	Short	Medium	Definite	Medium
	Soil	Local	Long	Medium	Definite	Medium
	Surface water	N/A	N/A	N/A	N/A	N/A
	Topography	N/A	N/A	N/A	N/A	N/A
	Visual	Site	Medium	Low	Definite	Low

(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 infrastructure (i.e. offices and storerooms) will be established at the site as Orion shall make use of facilities in the town of Prieska.

Invasive prospecting: The proposed locality of the first phase 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 geophysical surveys have been completed.

Alternatives considered:-

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

Invasive prospecting: The drilling of percussion rapid air blast (RAB) boreholes for sampling purposes over the entire application area was considered, but taking into account that Orion 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	• Speed limits; • Spraying of surfaces with water; • Avoidance of unnecessary removal of vegetation; • Re-vegetation and monitoring of re-growth; • Rehabilitation of disturbed areas; and • Controlled drilling operations, preferably on wind-free days.	Low
Fauna	• Speed limits; • Continuous rehabilitation of disturbed areas; • Snares & traps removed and destroyed; and • Maintenance of firebreaks.	Medium
Flora	• Continuous rehabilitation of disturbed areas; • Avoidance of unnecessary removal of vegetation; • Re-vegetation and monitoring of re-growth; • Maintenance of firebreaks; • No trees felled for firewood; • Obtain relevant permit before removal of protected tree or plant species; and • Re-seeding where necessary.	High

Ground water	• Immediate removal of any hydrocarbon spill; • Maintenance in dedicated area; • Re-fuelling in dedicated area; • Drip pans; • Storage of hydrocarbons in dedicated areas; and • Monitoring of groundwater quality.	Low
Noise	• Hearing protection; • Working hours; • Controlled drilling operations; • Silencers on equipment and vehicles; and	Medium
Soil	• Continuous rehabilitation of disturbed areas; • Ripping of compacted areas; • Maintenance & refuelling in dedicated areas; • Drip pans; • Storage of hydrocarbons in dedicated areas; and • Immediate removal of any hydrocarbon spill.	Medium
Surface water	• Storm water control; • Control and monitoring of erosion; • Immediate removal of any hydrocarbon spill; • Maintenance & re-fuelling in dedicated areas; • Drip pans; and • Storage of hydrocarbons in dedicated areas.	N/A
Topography	• Sloping of rehabilitated and disturbed areas.	N/A
Visual	• Sloping of rehabilitated and disturbed areas;	Low

(ix) Motivation where no alternative sites were considered:

No infrastructure (i.e. offices and storerooms) will be established at the site as Orion shall make use of facilities in the town of Prieska.

(x) Statement motivating the preferred site:
(Provide a statement motivating the final site layout that is proposed.)

No infrastructure (i.e. offices and storerooms) will be established at the site as Orion shall make use of facilities in the town of Prieska.

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.

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

NAME OF ACTIVITY (e.g. For prospecting – drill site, site camp, ablution 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, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…)	**POTENTIAL IMPACT** (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…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated. (e.g. Construction, commissioning, operational, decommissioning, closure, post-closure)	**SIGNIFICANCE** If not mitigated	**MITIGATION TYPE** modify, remedy, control or stop through: (e.g. noise control measures, 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.)	**SIGNIFICANCE** If mitigated
Access Tracks	• Dust • Disturbance of the natural habitat of fauna • Disturbance / destruction of natural vegetation cover • Groundwater contamination from hydrocarbon spills • Noise from vehicles travelling on the access tracks • Compaction of soil.	Air quality Fauna Flora Groundwater Soil Surface water	Operational (Drilling)	Low	• Maintenance of access tracks / roads • Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control • Erosion control	Very Low

	• Erosion				• Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Chemical toilets	• Soil contamination • Groundwater contamination	Groundwater Soil	Operational (Drilling)	Very Low	• Maintenance of toilets on regular basis. • Removal of toilets upon closure.	N/A
Drilling activities	• Nuisance dust created by drill rig • Disturbance of the natural habitat of fauna • Disturbance / destruction of natural vegetation cover • Groundwater contamination from hydrocarbon spills • Noise from drill rig • Compaction and / or disturbance of soil structure • Changing of natural aesthetic view of environment by drill rig	Air quality Fauna Flora Groundwater Soil Surface water	Operational (Drilling)	Medium	• Avoidance of unnecessary removal of vegetation • Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth • Controlled drilling operations, preferably on wind-free days • Immediate removal of any hydrocarbon spill • Maintenance and re-fuelling to take place in dedicated area • Drip pans • Storage of hydrocarbons in dedicated area • Hearing protection • Working hours • Ripping of compacted areas	Low

(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
Archaeological and Cultural Heritage Impact Assessment	Await Report	Await Report	Await Report

Attach copies of Specialist Reports as appendices.

(l) 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.

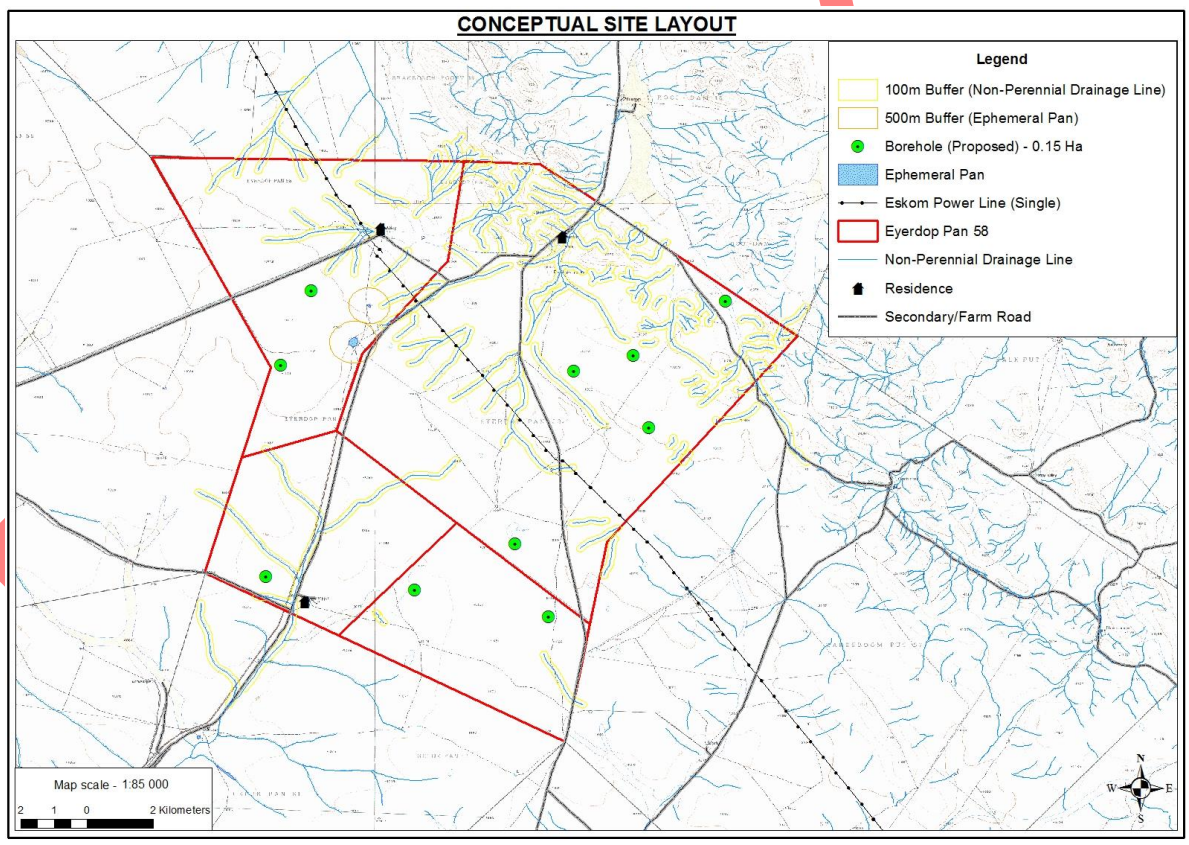


Figure 17 – Site layout with buffer zones

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

Infrastructure: No infrastructure (i.e. offices and storerooms) will be established at the site as Orion shall make use of facilities in the town of Prieska.

Invasive prospecting: The proposed locality of the first phase 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 geophysical surveys have been completed.

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

Invasive prospecting: The drilling of percussion rapid air blast (RAB) boreholes for sampling purposes over the entire application area was considered, but taking into account that Orion 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.

- 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.
  - Spraying of unpaved site areas and access tracks utilized by the prospecting operation with water as needed;
  - 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.
  - Dust suppression techniques will be applied during drill programmes.

- 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.
  - No open fires allowed.

- 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.
  - 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 where drilling is undertaken close to farm houses or other dwellings.
  - 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.
- Orion will comply with the occupational noise Regulations of the Occupational Health and Safety Act, Act 85 of 1993.
- Orion 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.

- 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 Prieska where it will be stored in steel containers supplied by an oil recycling 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.

- 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. Orion 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.

Orion'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.

R106 573-11

(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 (DMR) 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 Orion 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.

- **Section A.1, number 1.2:**
  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 (the average of each year was used) in terms of the published STATS SA CPI rates.

  The CPI rates can be found at:
  (http://www.statssa.gov.za/publications/P0141/CPIHistory.pdf).

Table B2 – CPI headline year-on-year rates[3]

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

[3] Rates shown in Table B2 show the official inflation rates as published in the monthly CPI release.

- **Section B – Process followed:**

  - **<u>Step 1: Determine primary mineral and saleable mineral by-products:</u>**

    The minerals applied for: Berylium, Bismuth, Cadmium, Cerium, Chromium, Dysprosium, Erbium, Europium, Feldspar, Gadolinium, Gallium, Germanium, Feldspar (Gemstone), Heavy Minerals, Holmium,

Indium, Lanthanum, Lithium, Mica, Manganese, Monazite, Neodymium, Nickel, Platinum Group Metals, Promethium, Praceodymium, Radium, Rare Earths, Sulphur, Scandium, Samarium, Tin, Stone Aggregate (Waste dump), Tantalum, Terbium, Tellerium, Thorium, Thulium, Titanium, Uranium, Xenotime, Yttrium, Ytterbium.

- **Step 2A: Determine primary risk class:**

The primary risk class is as follows in terms of Table B.12.

Mineral	Small mine (Mine, mine waste)
Berylium	Not listed
Bismuth	Not listed
Cadmium	Class C
Cerium	Not listed
Chromium	Not listed
Dysprosium	Not listed
Erbium	Not listed
Europium	Not listed
Feldspar	Class C
Gadolinium	Not listed
Gallium	Not listed
Germanium	Not listed
Feldspar (Gemstone)	Not listed
Heavy Minerals	Not listed
Holmium	Not listed
Indium	Not listed
Lanthanum	Not listed
Lithium	Not listed
Mica	Not listed
Manganese	Not listed
Monazite	Not listed
Neodymium	Not listed
Nickel	Class C
Platinum Group Metals	Not listed
Promethium	Not listed
Praceodymium	Not listed
Radium	Not listed
Rare Earths	Not listed
Sulphur	Not listed
Scandium	Not listed
Samarium	Not listed
Tin	Class C
Stone Aggregate (Waste dump)	Not listed
Tantalum	Not listed
Terbium	Not listed
Tellerium	Not listed
Thorium	Not listed
Thulium	Not listed
Titanium	Class C
Uranium	Class B

Xenotime	Not listed
Yttrium	Not listed
Ytterbium	Not listed

The risk class used in this calculation is thus 'Class B – Medium Risk'.

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

Saleable by-products in terms of Table B.14:

Mineral	Impact on primary risk class
Berylium	Not listed
Bismuth	Not listed
Cadmium	Not listed
Cerium	Not listed
Chromium	Not listed
Dysprosium	Not listed
Erbium	Not listed
Europium	Not listed
Feldspar	Not listed
Gadolinium	Not listed
Gallium	N/A
Germanium	N/A
Feldspar (Gemstone)	Not listed
Heavy Minerals	Not listed
Holmium	Not listed
Indium	N/A
Lanthanum	Not listed
Lithium	Not listed
Mica	Not listed
Manganese	Not listed
Monazite	Not listed
Neodymium	Not listed
Nickel	Not listed
Platinum Group Metals	Not listed
Promethium	Not listed
Praceodymium	Not listed
Radium	Not listed
Rare Earths	Not listed
Sulphur	Risk Class C to B
Scandium	Not listed
Samarium	Not listed
Tin	Not listed
Stone Aggregate (Waste dump)	Not listed
Tantalum	N/A
Terbium	Not listed
Tellerium	No additional impact
Thorium	Not listed
Thulium	Not listed
Titanium	Not listed

Uranium	Not listed
Xenotime	Not listed
Yttrium	N/A
Ytterbium	Not listed

- **Step 3: Determine environmental sensitivity of mine area:**

The criteria in terms of Table B.4 were used to determine the area sensitivity:

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

The area sensitivity has been determined as 'Medium'.

- **Step 4: For Class A or B mining operations:**

  - **Step 4.1: Determine level of information available:**

    The level of information available for the operation is classified as 'extensive' as the following information is available:
    - Approved BAR/EMPR;
    - Rehabilitation and Closure Plan (in BAR/EMPR); and
    - Detailed breakdown of costs (quantum calculations in BAR/EMPR).

  - **Step 4.2: Identify closure components:**

    All closure components in terms of Table B.5 for open-cast operations are applicable to the quantum calculation.

  - **Step 4.3: Identify unit rates for closure components:**

Component	Risk Class	Sensitivity	Multiplication Factor	Unit	Master Rate (2004)	Master Rate (2020)
1	B	Medium	1.00	m^3	6.82	15.64
2(A)	B	Medium	1.00	m^2	95.00	217.91
2(B)	B	Medium	1.00	m^2	140.00	321.13
3	B	Medium	1.00	m^2	17.00	38.99
4(A)	B	Medium	1.00	m	165.00	378.47
4(B)	B	Medium	1.00	m	90.00	206.44
5	B	Medium	1.00	m^2	190.00	435.81
6	B	Medium	0.52	Ha	96,700.00	221 806.62
7	N/A	N/A	N/A	N/A	N/A	N/A
8(A)	B	Medium	1.00	Ha	66,400.00	147 718.16
8(B)	B	Medium	1.00	Ha	82,700.00	189 693.97
8(C)	B	Medium	0.76	Ha	240,200.00	550 961.21
9	B	Medium	1.00	Ha	55,600.00	127 533.07
10	B	Medium	1.00	Ha	52,600.00	120 651.79

11	B	Medium	1.00	Ha	52,600.00	120 651.79
12	B	Medium	1.00	m	60.00	137.63
13	B	Medium	0.60	Ha	20,000.00	45 875.20
14	B	Medium	1.00	Ha	7,000.00	16 056.32

- **Step 4.4: Identify and apply weighting factors:**

  Weighting Factor 1 – Nature of Terrain = 1.00
  The nature of the terrain has been determined as Flat: Generally flat over the prospecting right area.

  Weighting Factor 2 – Proximity to urban area = 1.05
  The proximity to urban area where goods and services are to be supplied has been determined as Peri-Urban: Less than 150km from a developed urban area.

- **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 – No processing plant or related structures shall be established.	0 m³
2(A)	Demolition of steel buildings and structures Not applicable – No steel buildings or structures will be established.	0 m²
2(B)	Demolition of reinforced concrete buildings and structures Not applicable – No reinforced concrete buildings or structures shall be established.	0 m²
3	Rehabilitation of access roads Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the operation will create 500m of two-spoor tracks (3m wide) for the drilling rig to gain access to the drilling sites.	1 500 m²
4(A)	Demolition and rehabilitation of electrified railway lines Not applicable – There are no electrified railway lines at the site.	0 m
4(B)	Demolition and rehabilitation of non-electrified railway lines Not applicable – There are no non-electrified railway lines at the site.	0 m
5	Demolition of housing and/or administration facilities Not applicable – No housing or administration facilities shall be established.	0 m²
6	Opencast rehabilitation including final voids and ramps Not applicable – Orion shall not conduct any excavations, trenching, pitting or bulk sampling.	0 Ha

7	Sealing of shafts adits and inclines Not applicable	0 m^3
8(A)	Rehabilitation of overburden and spoils Not applicable – Orion shall not conduct any excavations, trenching, pitting or bulk sampling.	0 Ha
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential) Not applicable – No evaporation ponds shall be established.	0 Ha
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential) Not applicable - No evaporation ponds shall be established.	0 Ha
9	Rehabilitation of subsided areas Not applicable – There are no subsided areas at the site.	0 Ha
10	General surface rehabilitation Provision is made for a 10m x 15m surface disturbance around each of the ten prospecting boreholes.	0.15 Ha
11	River diversions Not applicable – There are no rivers within the prospecting right area.	0 m
12	Fencing Not applicable – Orion shall not erect any fencing.	0 m
13	Water management Not applicable – Orion shall not establish any water infrastructure.	0 Ha
14	2 to 3 years maintenance and aftercare Not applicable for this quantum as no invasive prospecting has taken place.	0 Ha
15 (A) & 15(B)	Specialist study	

- **Step 4.6: Identify closure costs from specialists studies**

  It is recommended that a Water Pollution Potential study and Overall Quantified Risk Assessment must be conducted before closure of the Orion Project.

- **Step 4.7: Calculate Closure Costs**

  Determination of preliminary and general & Contingencies %
  - Preliminary and General: Add 6% of Subtotal 1 if Subtotal < R100,000,000.
  - Contingencies: Add 10% of Subtotal 1.

CALCULATION OF THE QUANTUM

Applicant: **ORION EXPLORATION NO. 4 (PTY) LTD** **Ref No:** **NC 12567 PR**
Date: **AUGUST 2020**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and pow erlines)	m3	0.00	15.64	1	1	0.00
2 (A)	Demolition of steel buildings and structures	m2	0.00	217.91	1	1	0.00
2(B)	Demolition of reinforced concrete buildings and structures	m2	0.00	321.13	1	1	0.00
3	Rehabilitation of access roads	m2	1 500.00	38.99	1	1	58 490.89
4 (A)	Demolition and rehabilitation of electrified railw ay lines	m	0.00	378.47	1	1	0.00
4 (B)	Demolition and rehabilitation of non-electrified railw ay lines	m	0.00	206.44	1	1	0.00
5	Demolition of housing and/or administration facilities	m2	0.00	435.81	1	1	0.00
6	Opencast rehabilitation including final voids and ramps	ha	0.000	221 806.62	0.52	1	0.00
7	Sealing of shafts adits and inclines	m3	0.00	116.98	0	0	0.00
8 (A)	Rehabilitation of overburden and spoils	ha	0.000	147 718.16	1	1	0.00
8 (B)	Rehabilitation of processing w aste deposits and evaporation ponds (non-polluting potential)	ha	0.00	189 693.97	1	1	0.00
8 (C)	Rehabilitation of processing w aste deposits and evaporation ponds (polluting potential)	ha	0.00	550 961.21	0.76	1	0.00
9	Rehabilitation of subsided areas	ha	0.00	127 533.07	1	1	0.00
10	General surface rehabilitation	ha	0.15	120 651.79	1	1	18 097.77
11	River diversions	ha	0.00	120 651.79	1	1	0.00
12	Fencing	m	0.00	137.63	1	1	0.00
13	Water management	ha	0.00	45 875.20	0.6	1	0.00
14	2 to 3 years of maintenance and aftercare	ha	0.00	16 056.32	1	1	0.00
15 (A)	Specialist study	Sum	0.00		1	1	0.00
15 (B)	Specialist study	Sum	0.00		1	1	0.00
					Total of 1 - 15 above		**76 588.65**

weighting factor 2
1.05

Subtotal 1	**80 418.09**

1	Preliminary and General	4 595.32	4 595.32
2	Contingencies	7 658.87	7 658.87
		Subtotal 2	**92 672.27**
		VAT (15%)	13 900.84
		Grand Total	**106 573.11**

- **Step 5: For Class C Mining operations:**
  Not applicable – The prospecting operation has been classified as a Class B operation.

- **Step 6: Independent review by competent person**
  The quantum calculation has not been reviewed by an independent competent person.

(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 parson.
(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.

Await Archaeological Report.

A no prospecting buffer zone of 100m shall be placed around any of the below heritage environments, should they be found within the application area.
- Burial grounds and grave sites
- Archaeological sites
- Buildings and structures older than 60 years and walling sites

(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. Find attached motivation as Appendix '8'.

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.)

Orion's prospecting activities for various minerals will be phased over a period of five years.

Prospecting Work:

- Compile a working plan on a scale of 1:10,000, which would integrate all geological, geophysical and geochemical data, as well as farm tracks, fences and drainages, to cover the relevant portion of the prospect area.
- Geological mapping of a zone covering the approximate position of the paleo seafloor setting.
- Ground EM surveys to detect any conductors.
- Reconnaissance soil sampling traverses followed by more detailed and systematic soil sampling.
- Diamond and reverse circulation drilling to test the conductors and soil geochemical anomalies at depth (20m to 750m). If economic grades of base metals are intersected, follow-up boreholes will be drilled to delineating the economic zones. An initial 10 holes are planned to a maximum depth of 750m for the first exploration phase.
- If an economic deposit is discovered, resource drilling, a mineral resource estimation, and feasibility studies will be done to determine whether the deposit is economically viable.
- The eventual extent of an orebody, if one exists, will determine the number of boreholes to be drilled.
- The site clearance for drill rigs will be kept to a minimum and provision is made for a 10m x 15m 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.

Geochemical Surveys:

- It is expected that more than 5 000 soil samples may be collected on traverse lines and analysed using a hand-held XRF and laboratory analysis.

Geophysical Surveys:

- The area will be flown with airborne EM system which has been used with great success on the other areas. Target areas will then be followed up with ground EM surveys to determine dip and depth of targets. These surveys will both be outsourced.

Prospecting Methods:

- It is not intended to carry out any excavations, trenching or pitting on the prospect area for the duration of the prospecting right applied for.
- No bulk sampling is planned. If at the end of this prospecting period an orebody of economic tonnage and grades should be proven, an extension of the

prospecting right will be applied for, for the purpose of bulk sampling and testing. In the event of an economic orebody being proven or indicated well before the end of the prospecting period, an amended work programme will be submitted to the DMR for approval.

- Drilling is the only invasive prospecting methods planned.

No infrastructure (i.e. offices and storerooms) will be established at the site as Orion Exploration No. 4 (Pty) Ltd (hereinafter referred to as 'Orion') shall make use of facilities in the town of Prieska.

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.)

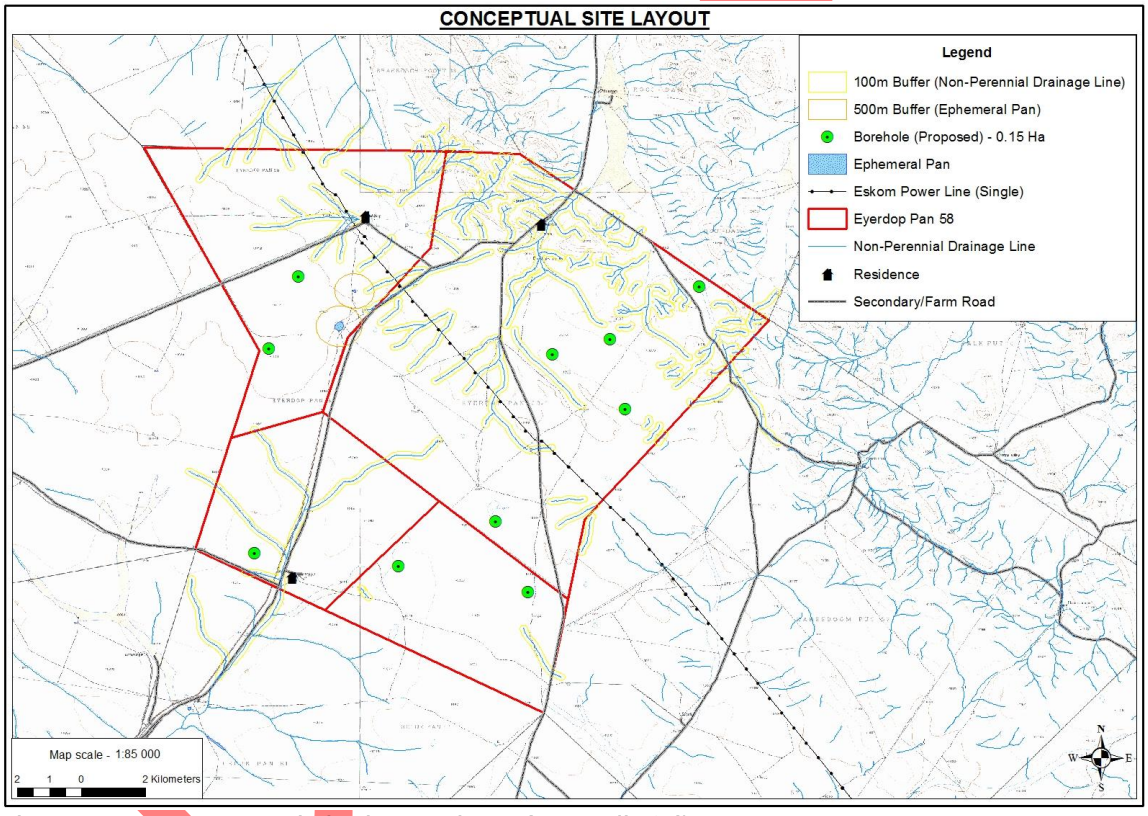


Figure 18 – Conceptual site layout (See Appendix '4')

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 Orion'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.

There will only be two water uses at the site, being:

- Domestic use (drinking water)
  The drilling team, consisting of five people, will be on the site during the drilling phase of the prospecting operation. Provision for 50 litres of water per day is made for drinking water.

- Water use at drilling rig
  Water for the diamond and/or reverse circulation drill rig will be needed. Orion plans to drill ten boreholes initially as the first phase of drilling. Provision is made for 2 000 litres of water per day for the drill rig.

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

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 10m³ of water is taken from a groundwater resource per day on average over a year on a property.

Orion will obtain municipal water from the town of Marydale and will not make use of groundwater. The municipal water will be transported to the site on a daily basis in a 2 000 litre JoJo tank fitted on a trailer.

Accordingly, Orion 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.

(iv) Impacts to be mitigated in their respective phases
Measures to rehabilitate the environment affected by the undertaking of any listed activity.

ACTIVITY (e.g. For prospecting – drill site, site camp, ablution 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, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…)	**PHASE** Of operation in which activity will take place State: Planning and design, pre-construction, construction, operational, rehabilitation, closure, post-closure	**SIZE AND SCALE of disturbances** Volumes, tonnages and hectares or m^2)	**MITIGATION MEASURES** (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants.)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to rehabilitation specifically this must take place at the earliest opportunity. With regard to rehabilitation, therefore state either: - Upon cessation of the individual activity, or - Upon cessation of the mining, bulk sampling or alluvial diamond prospecting as the case may be.
Access Tracks	Operational Rehabilitation Closure	1 500m^2	• Maintenance of roads / access tracks. • Dust control and monitoring. • Groundwater quality monitoring • Noise control and monitoring. • Speed limits. • Stormwater run-off control • Erosion control • Immediately clean hydrocarbon spills	The following must be placed at the site and is applicable to all activities: ○ Relevant Legislation; ○ Acts; ○ Regulations; ○ COP's; and ○ SOP's Management and staff must be trained to understand the contents of these documents, and	Ripping of access tracks upon closure of prospecting right.

			• Ripping of access tracks / roads upon closure.	to adhere to thereto. • Environmental Awareness Training must be provided to employees. • The operation must have a rehabilitation and closure plan. Management and staff must be trained to understand the contents of these documents, and to adhere to thereto. Annual Performance Assessment Reports and Quantum Calculations must be done to ensure that the operation adheres to the contents of the BAR & EMPr documents.	
Chemical toilets	Operational Closure	6m² each	• Maintenance of the toilets. • Removal of toilets upon closure.		Removal of toilets upon closure of prospecting right.
Drilling activities	Operational Rehabilitation Closure	1 500m²	• Avoidance of unnecessary removal of vegetation. • Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth • Controlled drilling operations, preferably on wind-free days • Immediate removal of any hydrocarbon spills • Maintenance and re-fuelling to take place in dedicated area • Drip pans • Storage of hydrocarbons in dedicated area • Hearing protection • Working hours kept between sun-up and sun-down • Ripping of compacted / disturbed areas		Ripping of disturbed areas upon closure of prospecting right.

e) Impact Management Outcomes

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

ACTIVITY (whether listed or not listed) (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…)	**POTENTIAL IMPACT** (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…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated. (e.g. Construction, commissioning, operational, decommissioning, closure, post-closure)	**MITIGATION TYPE** modify, remedy, control or stop through: (e.g. noise control measures, 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.)	**STANDARD TO BE ACHIEVED** (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives etc.)
Access tracks	• Dust • Disturbance of the natural habitat of fauna • Disturbance / destruction of natural vegetation cover • Groundwater contamination from hydrocarbon spills • Noise from vehicles travelling on the access tracks • Compaction of soil. • Erosion	Air quality Fauna Flora Groundwater Soil Surface water	Operational Rehabilitation Closure	• Maintenance of access tracks • Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	• Safety ensured. • Dust levels minimized. • Minimize potential for hydrocarbon spills to infiltrate into groundwater. • Noise levels minimized. • Rehabilitation standards and closure objectives met. • Erosion potential minimized.

Chemical toilets	• Soil contamination • Groundwater contamination	Groundwater Soil	Operational Closure	• Maintenance of toilets on regular basis. • Removal of toilets upon closure.	• Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.
Drilling activities	• Nuisance dust created by drill rig • Disturbance of the natural habitat of fauna • Disturbance / destruction of natural vegetation cover • Groundwater contamination from hydrocarbon spills • Noise from drill rig • Compaction and / or disturbance of soil structure • Changing of natural aesthetic view of environment by drill rig	Air quality Fauna Flora Groundwater Soil Surface water	Operational Rehabilitation Closure	• Avoidance of unnecessary removal of vegetation • Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth • Controlled drilling operations, preferably on wind-free days • Immediate removal of any hydrocarbon spill • Maintenance and re-fuelling to take place in dedicated area • Drip pans • Storage of hydrocarbons in dedicated area • Hearing protection • Working hours • Ripping of compacted areas	• Dust levels minimized. • Rehabilitation standards and closure objectives met. • Minimize potential for hydrocarbon spills to infiltrate into groundwater. • Erosion potential minimized. • Noise levels minimized.

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.)

ACTIVITY (whether listed or not listed) (e.g. excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…)	**POTENTIAL IMPACT** (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…)	**MITIGATION MEASURES** (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants.)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to rehabilitation specifically this must take place at the earliest opportunity. With regard to rehabilitation, therefore state either: - Upon cessation of the individual activity, or - Upon cessation of the mining, bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed management standards or practices that have been identified by Competent Authorities.)
Access tracks	• Dust • Disturbance of the natural habitat of fauna • Disturbance / destruction of natural vegetation cover • Groundwater contamination from hydrocarbon spills • Noise from vehicles travelling on the access tracks • Compaction of soil. • Erosion	• Maintenance of access tracks / roads • Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Ripping of access tracks upon closure of prospecting right.	The following must be placed at the site and is applicable to all activities: ○ Relevant Legislation; ○ Acts; ○ Regulations; ○ COP's; and ○ SOP's Management and staff must be trained to understand the contents of these documents, and to adhere to thereto.
Chemical toilets	• Soil contamination • Groundwater	• Maintenance of toilets on regular basis.	Removal of toilets upon closure of prospecting right.	The following must be placed at the site and is

	contamination	• Removal of toilets upon closure.		applicable to all activities: ○ Relevant Legislation; ○ Acts; ○ Regulations; ○ COP's; and ○ SOP's Management and staff must be trained to understand the contents of these documents, and to adhere to thereto.
Drilling activities	• Nuisance dust created by drill rig • Disturbance of the natural habitat of fauna • Disturbance / destruction of natural vegetation cover • Groundwater contamination from hydrocarbon spills • Noise from drill rig • Compaction and / or disturbance of soil structure • Changing of natural aesthetic view of environment by drill rig	• Avoidance of unnecessary removal of vegetation • Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth • Controlled drilling operations, preferably on wind-free days • Immediate removal of any hydrocarbon spill • Maintenance and re-fuelling to take place in dedicated area • Drip pans • Storage of hydrocarbons in dedicated area • Hearing protection • Working hours • Ripping of compacted areas	Ripping of drilling sites upon closure of prospecting right.	The following must be placed at the site and is applicable to all activities: ○ Relevant Legislation; ○ Acts; ○ Regulations; ○ COP's; and ○ SOP's Management and staff must be trained to understand the contents of these documents, and to adhere to thereto.

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 Orion'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.

Meetings were held with the surface owners, on the … (refer to Appendix '7' for the attendance registers and meeting minutes). A draft copy of the Basic Assessment Report and Environmental Management Programme Report was provided to the surface owners for perusal and comment.

The content of the BAR & EMPR document was discussed during the meeting and the surface owners confirmed that the description of the existing status of the environment is a true reflection of the properties under application.

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

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.

- Submission of information
  Reports on rehabilitation and monitoring will be submitted bi-annually to the Department of Mineral Resources - 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. Orion's prospecting activities will not include bulk sampling which could impact on the stability of the land.

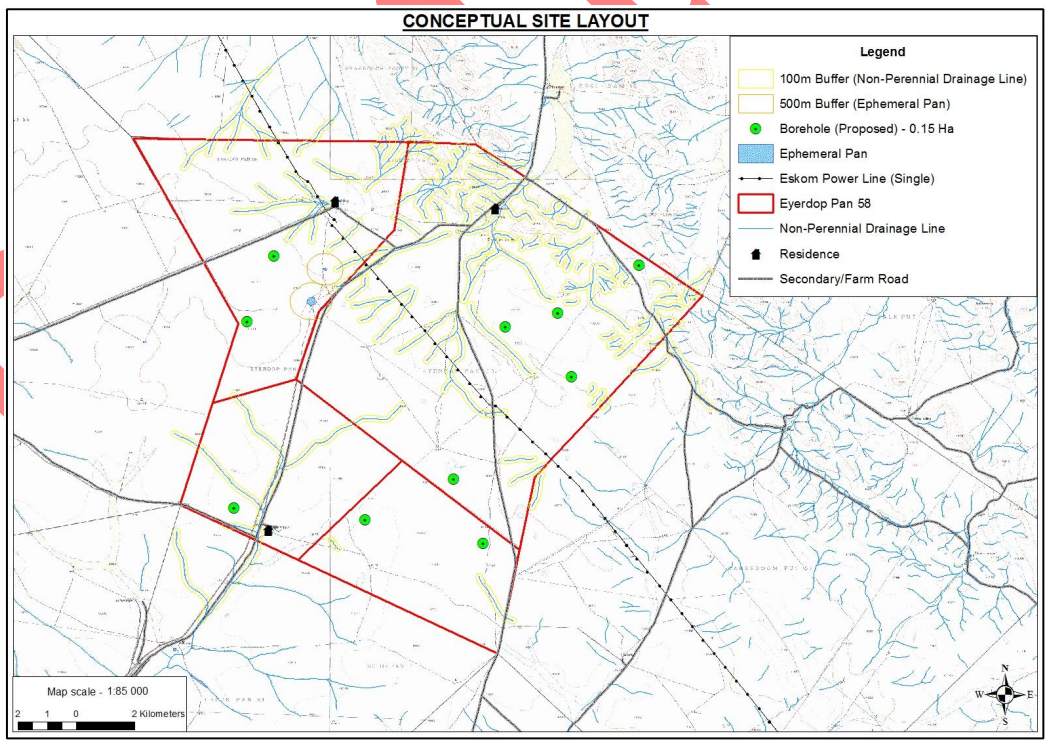


Figure 19 – Conceptual site layout map indicating proposed activities

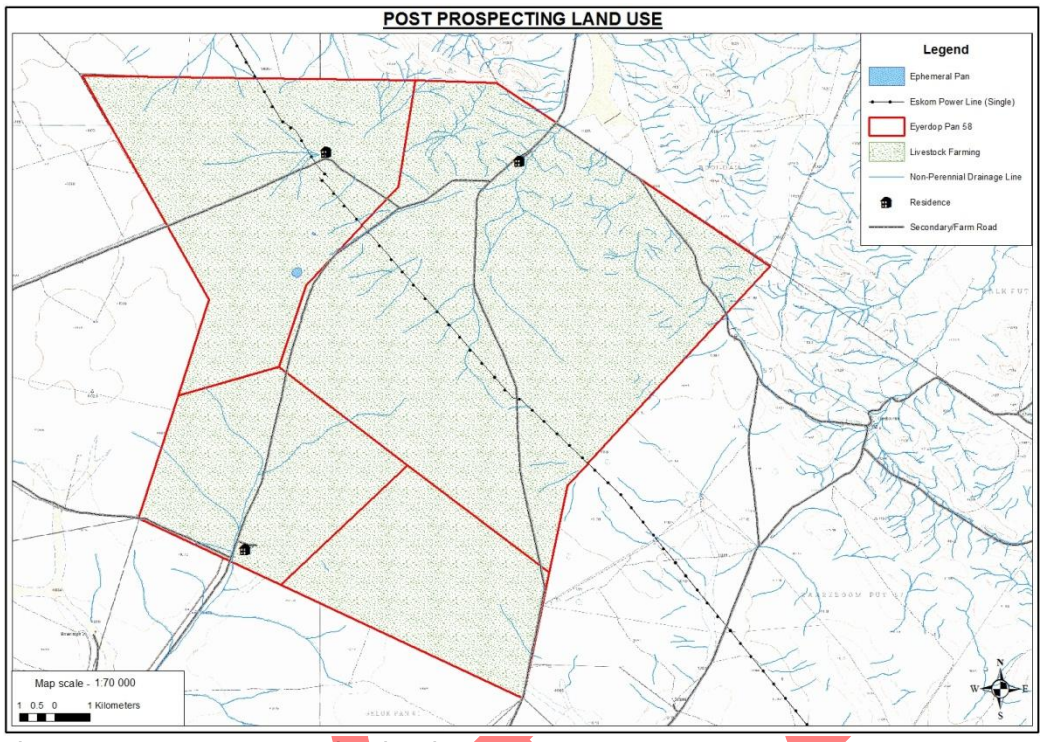


Figure 20 – Post prospecting land use map

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

The main closure objective of Orion'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.

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

CALCULATION OF THE QUANTUM

Applicant: **ORION EXPLORATION NO. 4 (PTY) LTD** **Ref No:** **NC 12567 PR**
Date: **AUGUST 2020**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0.00	15.64	1	1	0.00
2 (A)	Demolition of steel buildings and structures	m2	0.00	217.91	1	1	0.00
2(B)	Demolition of reinforced concrete buildings and structures	m2	0.00	321.13	1	1	0.00
3	Rehabilitation of access roads	m2	1 500.00	38.99	1	1	58 490.89
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0.00	378.47	1	1	0.00
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m	0.00	206.44	1	1	0.00
5	Demolition of housing and/or administration facilities	m2	0.00	435.81	1	1	0.00
6	Opencast rehabilitation including final voids and ramps	ha	0.000	221 806.62	0.52	1	0.00
7	Sealing of shafts adits and inclines	m3	0.00	116.98	0	0	0.00
8 (A)	Rehabilitation of overburden and spoils	ha	0.000	147 718.16	1	1	0.00
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.00	189 693.97	1	1	0.00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0.00	550 961.21	0.76	1	0.00
9	Rehabilitation of subsided areas	ha	0.00	127 533.07	1	1	0.00
10	General surface rehabilitation	ha	0.15	120 651.79	1	1	18 097.77
11	River diversions	ha	0.00	120 651.79	1	1	0.00
12	Fencing	m	0.00	137.63	1	1	0.00
13	Water management	ha	0.00	45 875.20	0.6	1	0.00
14	2 to 3 years of maintenance and aftercare	ha	0.00	16 056.32	1	1	0.00
15 (A)	Specialist study	Sum	0.00		1	1	0.00
15 (B)	Specialist study	Sum	0.00		1	1	0.00
					Total of 1 - 15 above		**76 588.65**

weighting factor 2
1.05

	Subtotal 1	**80 418.09**

1	Preliminary and General	4 595.32	4 595.32
2	Contingencies	7 658.87	7 658.87
		Subtotal 2	**92 672.27**
		VAT (15%)	13 900.84
		Grand Total	**106 573.11**

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

Orion will provide a financial guarantee to the calculated amount to the DMR upon request thereof.

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 Orion'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 DMR during drilling phase.
- 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	Quarterly surveys and submitted to the DMR annually during drilling phase.
- 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.	Project manager Environmentalist	Quarterly analysis and submitted to the DMR annually during drilling phase.
- Access tracks	Noise	Noise readings must be taken at pre-	Project manager	Monthly analysis and

- Drilling activities		determined noise monitoring points with sufficient, calibrated sound level meter.	Environmentalist	submitted to the DMR annually during drilling phase.

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

Performance Assessment Reports will be conducted every two years as is prescribed by Regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

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.

Orion 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.

Orion 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 Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

Orion shall provide the DMR 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; ☒

Signature of the Environmental Assessment Practitioner:

Name of company:

Date: