mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

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

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

NAME OF APPLICANT: **THUNDERFLEX 78 (PTY) LTD**
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FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/1/2/12842 PR**

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE SCOPING PROCESS

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

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

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

2) Contact Person and Correspondence Address

a) Details of:-

i) Details of the EAP who prepared the report:

Name of the Practitioner:	**ROELIEN OOSTHUIZEN**
Tel No.:	**084 208 9088**
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E-mail address:	roosthuizen950@gmail.com
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ii) Appointed by:

THUNDERFLEX 78 (PTY) LTD

iii) Expertise of the EAP

(b) The qualifications of the EAP

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

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

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

b) Description of the property

Farm Name:	FARM KANNIKWA 156 AND FARM KANNIKWA VLAKTE 157 ADMINISTRATIVE DISTRICT OF NAMAQUALAND IN EXTENT: 11 873.5649 HA NORTHERN CAPE PROVINCE, REPUBLIC OF SOUTH AFRICA.
Application area (Ha)	11 873.5649ha (Eleven thousand eight hundred and seventy-three comma five six four nine) hectares in extent
Magisterial district:	NAMAQUALAND, Northern Cape Province
Distance and direction from nearest town	The Kannikwa Prospect is a well-known part of the diamond landscape along the West Coast of South Africa, lying ~10km directly east of the coastal town of Port Nolloth, almost midway between the Orange River to the north and Buffels River to the south. The Prospect consists of two large adjacent farms, namely Kannikwa 156 and Kannikwavlakte 157, with a total surface area of 11872.4243 hectares (118.72km^2). Various infrastructure is available at Port Nolloth. The Kannikwa Diamond Prospect lies in the heart of the world-renowned Namaqualand Diamond District, bordered by the De Beers Namaqualand Mines diamond works at Kleinzee to the south, and Alexkor diamond works at Alexander Bay to the north and to the west. The Kannikwa Prospect lies between longitudes 16°57'34.7589"E and 17°06'15.5374"E and between latitudes 29°13'24.6950"S and 29°22'32.6334"S. In the UTM WGS84 grid coordinate system, this translates to between eastings 690466.646mE and 704238.612mE and between northings 6748545.081mN and 6765525.472mN. The total surface area of the Kannikwa Prospect is (118.7 square kilometres).
21 digit Surveyor General Code for each farm portion	Farm Kannikwa 156, Namaqualand District C05300000000015600000 Farm Kannikwa Vlakte 157, Namaqualand District C05300000000015700000

HISTORY

The ~140km stretch of coast between Alexander Bay and Kleinzee with adjacent emerged marine terraces has been the mainstay of the Namaqualand alluvial diamond district for the greatest part of the twentieth century. Although this immense wealth has mainly been mined out by 2008, a considerable proportion of viable deposits remains and is still being mined on a fairly substantial scale. Due to the sheer scale and abundance of viable deposits, the first and foremost focus has for decades been on the central deposits surrounding the Buffels and Orange River mouths.

However, through further study of the drainage patterns, several adjacent deposits which have been known but escaped scrutiny until recently are now regarded as the conduits and main contributors to many of the rich central deposits. The main conduit for the extensively mined Port Nolloth Reserve 155 and Oubeep areas is considered to be the palaeo-Kamma River, which runs across Kannikwa 156. In this regard, the Kannikwa Prospect is considered one of the most promising remaining stretches of diamond land in the Northern Namaqualand diamond province.

c) Locality map

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

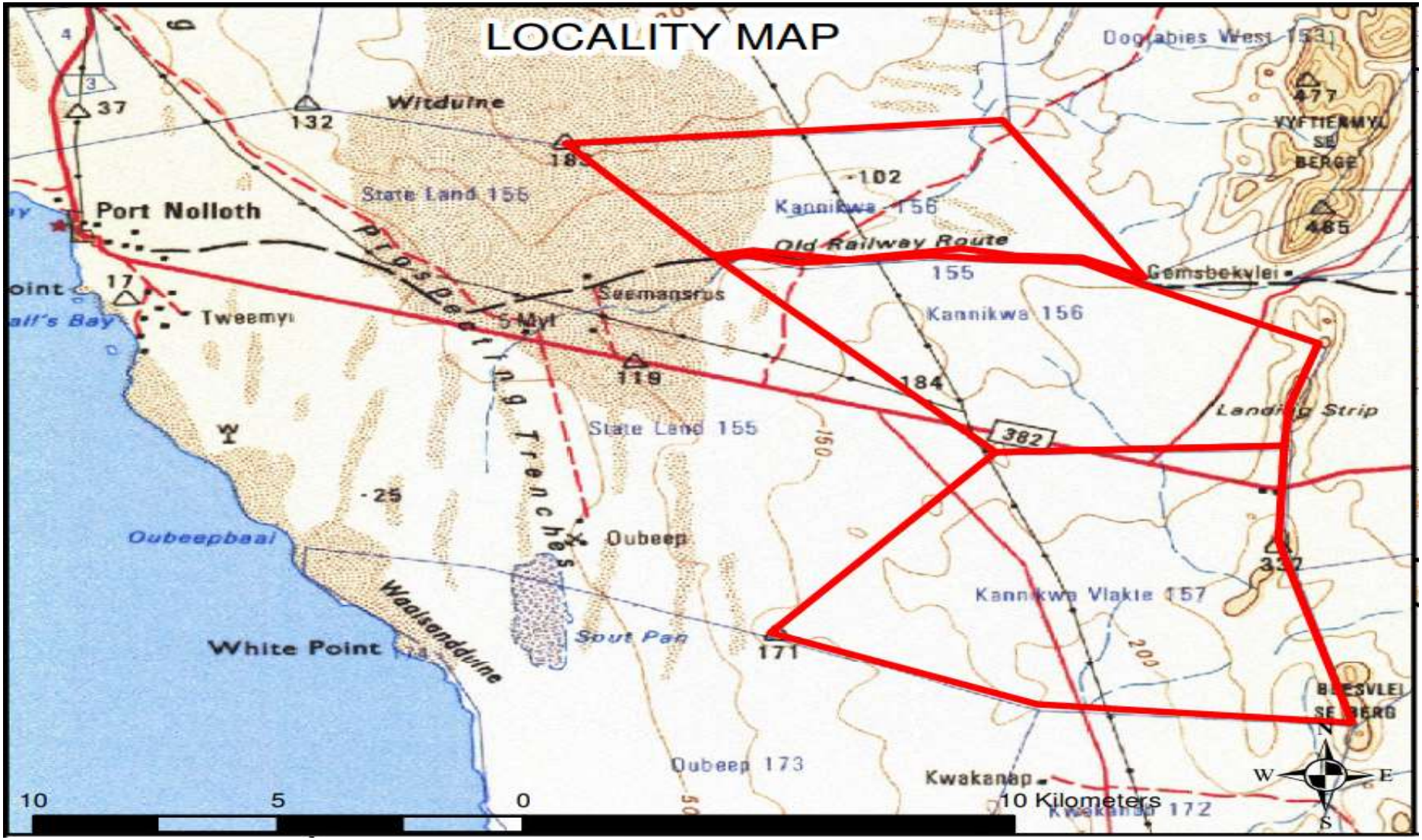


Figure 1. 1:250 000 topocadastral map indicating the application area in RED.

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

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

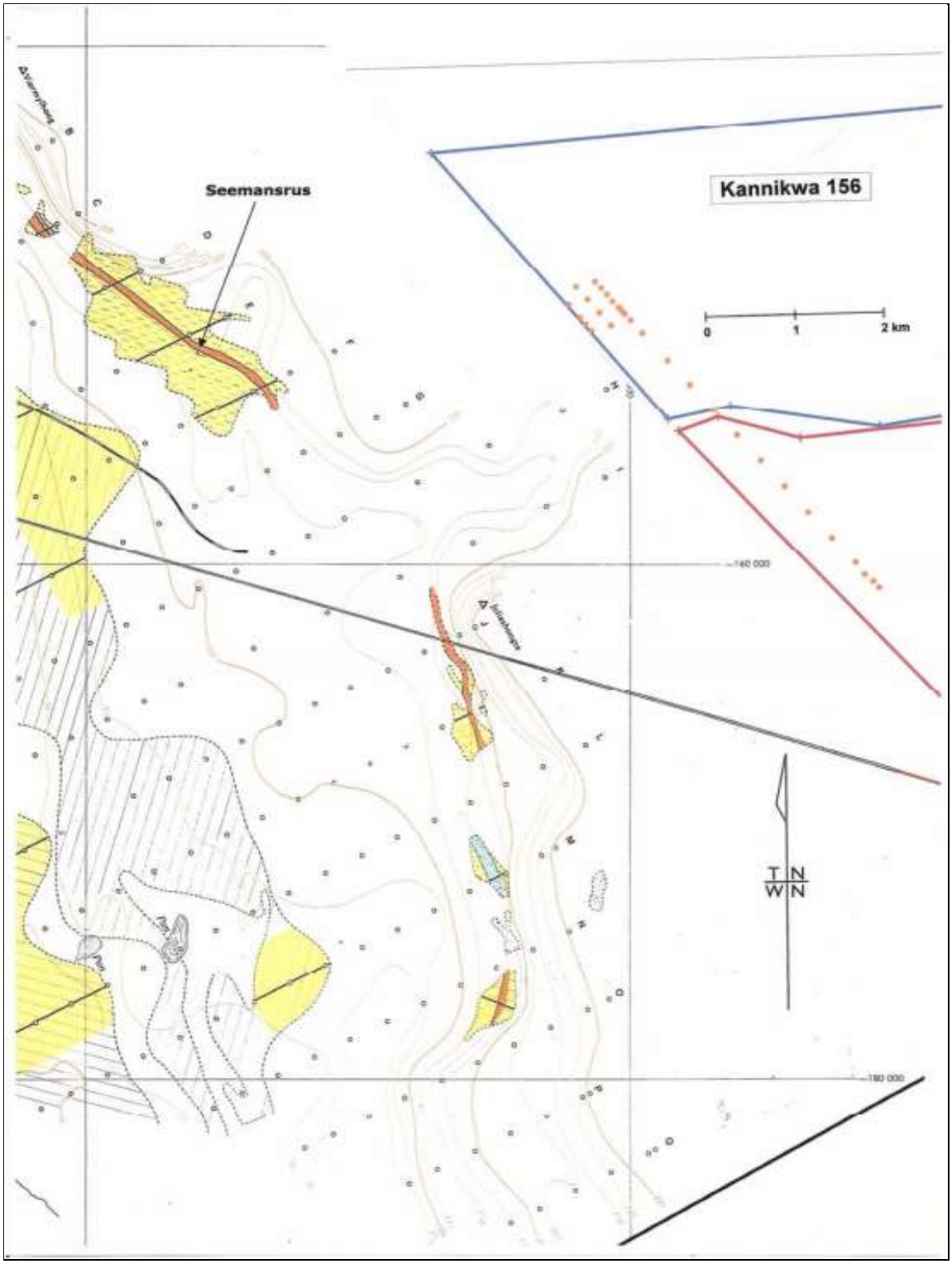


Figure 2. Composite of Keyser map and Kannikwa drill lines at 1 : 50 000 scale out of report by Megalodon Diamond Exploration – Kannikwa Prospect, New prospecting will continue in this area to continue previous work already done.

RC-drilling – Drilling is done in phases, over anomalous target areas, using reconnaissance lines or a grid of 200m X 200m or 100m X 50m depending on the level of confidence in the targets and the level of information required. The holes will be approximately 10 - 20 metres deep depending on local depth to bedrock (It is envisaged that at least 100 - 200 holes will be drilled depending on the depth at least 2000m will be drilled), drilling will cease and bulk sampling will continue on positive areas.

The exact location of the drilling holes will only be determined when the first phases of the prospecting programme have been completed. Kannikwa 156 is at an early stage of exploration where no scientifically recorded grade testing has been done, yet favourable geological indicators point firmly in the direction of a worthwhile investment, which has a significantly above average probability of yielding healthy returns.

It has therefore at this stage been shown to be a prime geological target worth investigating further, and is expected to yield a profitably mineable diamond resource after bulk sampling and gravel processing has been accomplished.

Table 1. Listed and Specified Activities

Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water distribution Pipelines	X	NEMA: LN1 (GNR327)
Activity 12: "The development of— The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or **(ii) infrastructure or structures with a physical footprint of 100 square metres or more;** where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse" Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.	X	NEMA: LN1 (GNR327)
Activity 13: "The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014"	Clean water dam or return water dam	X	NEMA: LN1 (GNR327)

Activity 14: "The development and related operation of facilities or infrastructure, for the storage and handling, of dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	2 X 23 000l diesel tanks = 46 000l with capacity for storing of old oils and new oils to be calculated	X	NEMA: LN1(GNR327)
Activity 20: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including – (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, crushing, screening or washing; But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing notice 2 applies. The Thunderflex operation directly relates to prospecting of a mineral resource (diamonds) and requires a prospecting right.	11 873,5649 ha application lodged Although the total area will never be prospected and the footprint with the drilling and bulk sampling is calculated to be ±60ha. Invasive Prospecting Pits 20 Trenches will be excavated with the following dimensions 100m X 200m = 40 ha pits that prove to contain gravels (tested positive). It is estimated that on average 3m of overburden (calcrete and soil) will be removed before accessing the gravel layer (average width 2m) which is host to the diamonds. The 5X bulk samples will be 200m X 200m (20 ha) X 10 – 20m deep.	X	NEMA: LN1 (GNR327)
Activity 24: The development of a road- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters;	Access and haul roads	X	NEMA: LN1 (GNR 327)

Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding 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.	±60 ha	X	NEMA: LN2 (GNR325)
Activity 19: The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including- (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or The primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing. The Thunderflex operation directly relates to prospecting of a mineral resource (diamonds) and requires permission in terms of Section 20 (MPRDA), for the removal and disposal of bulk samples of any minerals.	11 873,5649 ha. Although the total area will never be prospected and the footprint with the bulk sampling is calculated to be ± 60 ha.	X	NEMA: LN2 (GNR325)
Activity 10(g) iii of Listing Notice 3 The development and related operation of facilities or infrastructure for the storage, or storage of and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. i. Outside urban areas: (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	11 873,5649 ha on the total hectares of the area a total of ±60 ha will be disturbed with the drill pads, drill holes and bulk sampling.	X	NEMA LN3 (GNR 324)

Activity 12(g) i & ii of Listing Notice 3 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. - ii. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; iii. Within critically biodiversity areas identified in bioregional plans;	11 873,5649 ha on the total hectares of the area a total of ±60 ha will be disturbed with the drill pads, drill holes and bulk sampling.	X	NEMA LN3 (GNR 324)
Activity 15: The establishment of residue deposits resulting from activities which require a prospecting right.	0.3ha		NEMWA: Category A (GNR 633)
Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles Water tanks	± 200 m2 ± 300 m2 ± 2 000 m2 ± 250 m2 ± 30 m2 ± 500 m2 5 000 m2 3m x 3m = 9m² each		Not Listed
Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.	15m x 30m = 450m²		Not Listed

ii) Description of the activities to be undertaken

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

Prospecting activities described in this Prospecting Work Programme ("PWP") are designed to determining the gravel resource potential of the proposed application area. The prospecting activities will include non-invasive and invasive methods. A suitable level of feasibility study (technical and economic evaluation) will also be undertaken.

The prospecting activities will be invasive. Subsequent phases will be of the invasive-type, typically drilling a proposed drilling programme of 100 - 200 reverse circulation boreholes will be used to further define the ore body. The drilling programme will determine the exact outline, shape and size of the gravel body. The reverse circulation is generally done dry but water is used when large clay bodies are encountered. The samples are passed through a cyclone and collected within one metre plastic bags. These sample bags are placed in goups of 10 to represent ten metres. The holes drilled can vary from 20m to 40m depth; this entirely dependent on bedrock morphology.
Bulk sample test work will be undertaken to test the grade and quality and ultimately the economic viability of the potential deposit.

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

e) Policy and Legislative Context

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

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

Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.
Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Prospecting Right has been applied for (NC) 30/5/1/1/2/ 12842 PR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations)	- Control measures are to be implemented upon the approval of the EMPR.

	- 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)	- Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is

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

	and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)	
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa"s natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	- This will be established with a specialist study. It is not anticipated that the prospecting operation fall within any protected area which is known.
National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - 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	- To be implemented upon the approval of the EMPR.

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

	- Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse; (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	- A water use application must be submitted and will be submitted as soon as the EIA EMP had been finalized. - Control measures are to be implemented upon the approval of the EMPR.

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

	- 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.	- Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.

Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like; - Agriculture, land survey S10	- To take note.
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR

f) Need and desirability of the proposed activities

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

The Thunderflex 78 (Pty) Ltd Project is in line with the 'Beneficiation Strategy for the Minerals Industry of South Africa' (DMR, 2011) in terms of aiming to beneficiate diamonds for sale/export. The benefits of this will fall directly to the Northern Cape Province and, specifically, the Namaqualand District.

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

Need

Analysis of the Diamond Industry – ALROSA(website)

The Information on the analysis of the diamond industry was obtained from the ALROSA website which is one of the biggest diamond producers in the world.

The world diamond market is represented by diamond mining and trade in rough diamonds. The bulk of the world diamond mining is concentrated in nine countries, with their share in the global production in physical terms as high as 99%.

The world's largest producers of natural diamonds are Russia, the Democratic Republic of Congo (DRC) and Botswana, all together accounting over 60% of the global diamond production.

Top Countries in the Global Diamond Production 2016: 134.1 mln. Carats

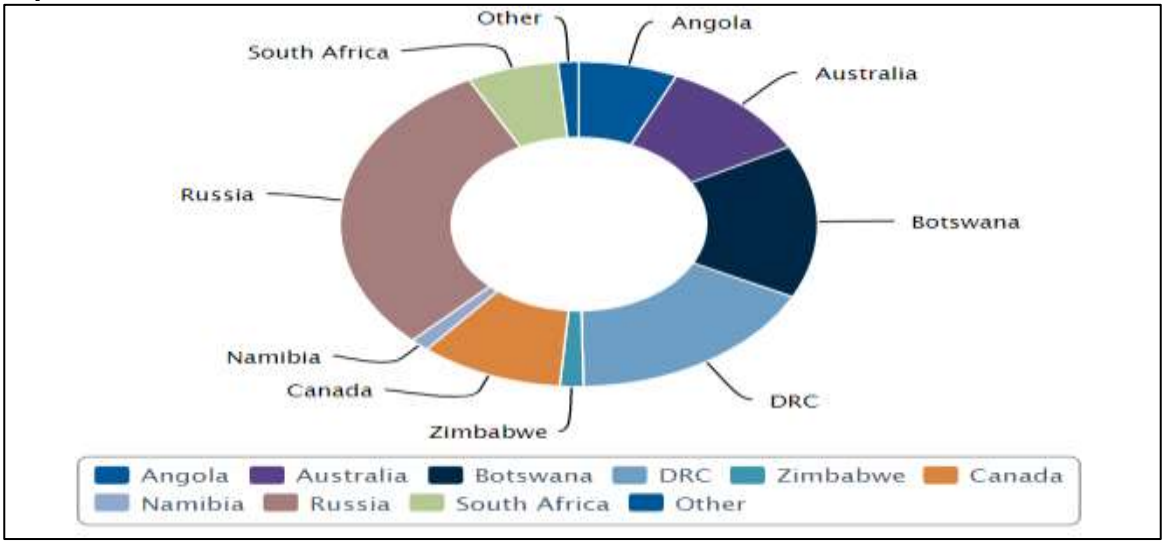


Figure 3. Kimberley Process companies' data Global Diamond Production 2011-16 (thousands carats)

World diamond production based on the costs of produced rough diamonds are dominated by Russia, Botswana and Canada with a combined production of more than 60% of the total worldwide production.

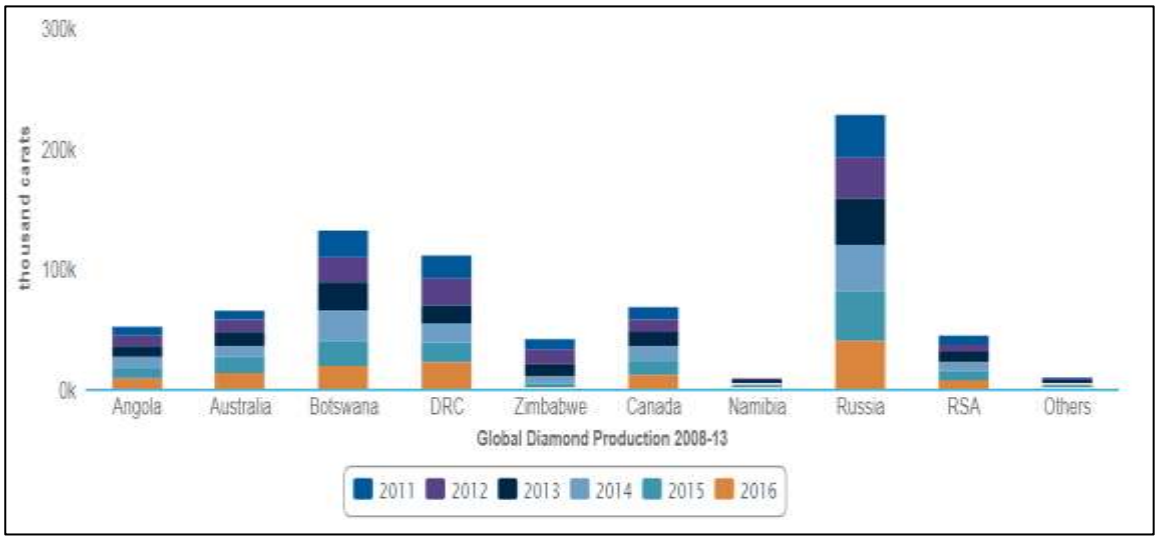


Figure 4. Global Diamond Production 2011-16 (thousands carats) Kimberley Process companies' data

Russia ranks first in the world's diamond production. ALROSA Group accounts for 93% of the total diamond production in the Russian Federation in physical terms, and it is the leader of the global diamond mining industry. Major mining companies are engaged in mining in the main diamond-producing countries, the exception being Zimbabwe and the DRC, where diamond deposits are developed by small companies and prospectors. The graph below represents the geography of the companies' activities including exploration.

Diamond Production by Leading Companies, 2016(- including Ekati; Companies' data*)**
The world's diamond mining is concentrated in the major primary deposits accounting for about 60% of the global diamond production. The remaining production is concentrated in placer deposits, the principal of them located in the DRC (Mbiji-Mayii) and Zimbabwe (Marange).

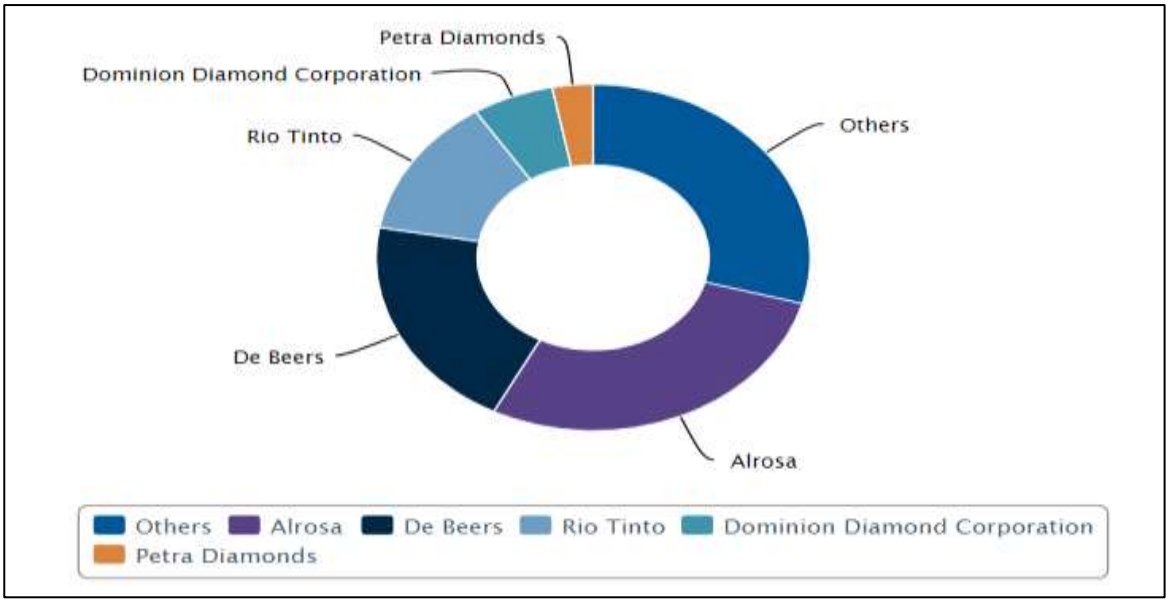


Figure 5. Diamond Production by Leading Companies, 2016(***** - *including Ekati; Companies' data)*

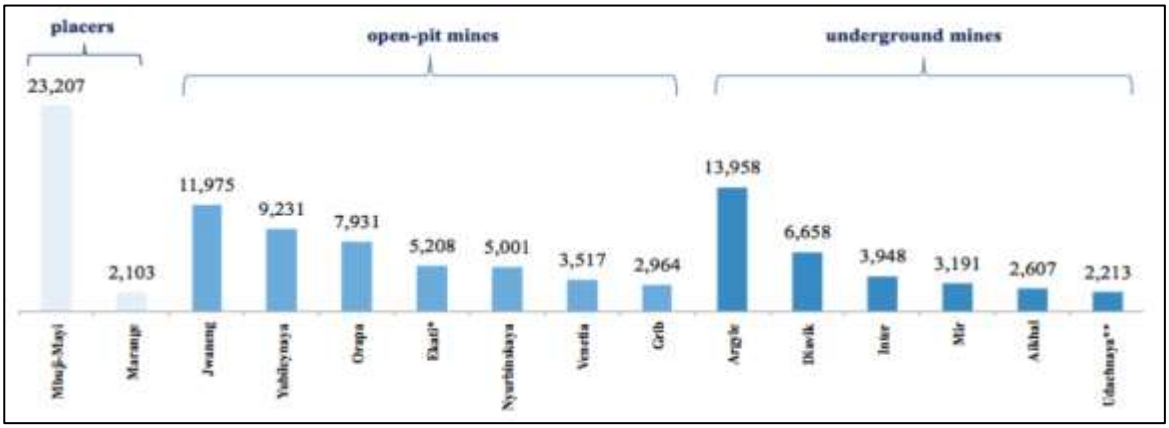


Figure 6. Production Output of the World's Major Diamond Deposits, 2016 (thousand carats) Kimberley Process and compnies' data; ***** - Ekati includes open-pit and undergroung mining; ****** - output, including further development of the open-pit

By their attributes diamonds from deposits fall into two categories: gem quality and industrial grade diamonds. The former is used in diamond jewelry production, while the latter is used for industrial purposes (manufacture of drills, saws, and abrasive powders). Gem quality rough diamonds are sorted by size, color, quality and shape, and then are sold to buyers in conformity with the sales policy adopted in a rough diamond production company. Depending on the quality of the mined rough diamonds, the current state of the market, the adopted marketing policy, companies use different approaches to diamond sales: sights, tenders, auctions, spot transactions and long-term contracts.

The world's largest trading centers, which concentrate the bulk of trade in natural rough diamonds, are India, Belgium, the UAE, the USA, Hong Kong and Israel. Being sold from mines, natural rough diamonds arrive at cutting and polishing plants to become polished

diamonds that will be used in jewellery making.

(The information above was sourced from the ALROSA website. ALROSA is a world leader in the world diamond mining industry, a Russian partially state-owned diamond mining company)

The Diamond Pipeline

The Diamond Pipeline can be defined as the route the diamond takes from mine to end consumer. The diamond pipeline, typically, comprises (**Fig. 4).**

Figure 7. The Diamond Pipeline

Exploration/Prospecting; involves geologists finding diamond deposits in different areas. Prospecting is vital to the future survival of any diamond business as there is a predicted supply-demand gap.

Mining and Recovery; once diamonds have been discovered and surveys shown that it is financially viable to mine them; they are now recovered from the ground. The manner in which they are mined and recovered depends on their source, thus, where they are found.

Sorting and valuing; process of sorting and valuing of diamonds, categorizing them according to size, quality, model and colour.

Cutting and polishing; refers to manufacturing of diamonds; the process of turning rough diamonds into polished.

Polished Market; this is referred to as the 'diamond exchange bourse', a place where diamonds are traded. These are located in some of the world's major diamond manufacturing centres, e.g. Belgium.

Retailing; polished diamonds find their way to Jewellers and Consumers through Wholesalers and Retailers.

International Diamond Market Trends

Although global financial stability has proven quite volatile over the past 4-5 years, the diamond industry appears to have stabilised somewhat, with moderate increases in diamond prices forecast for the immediate future.

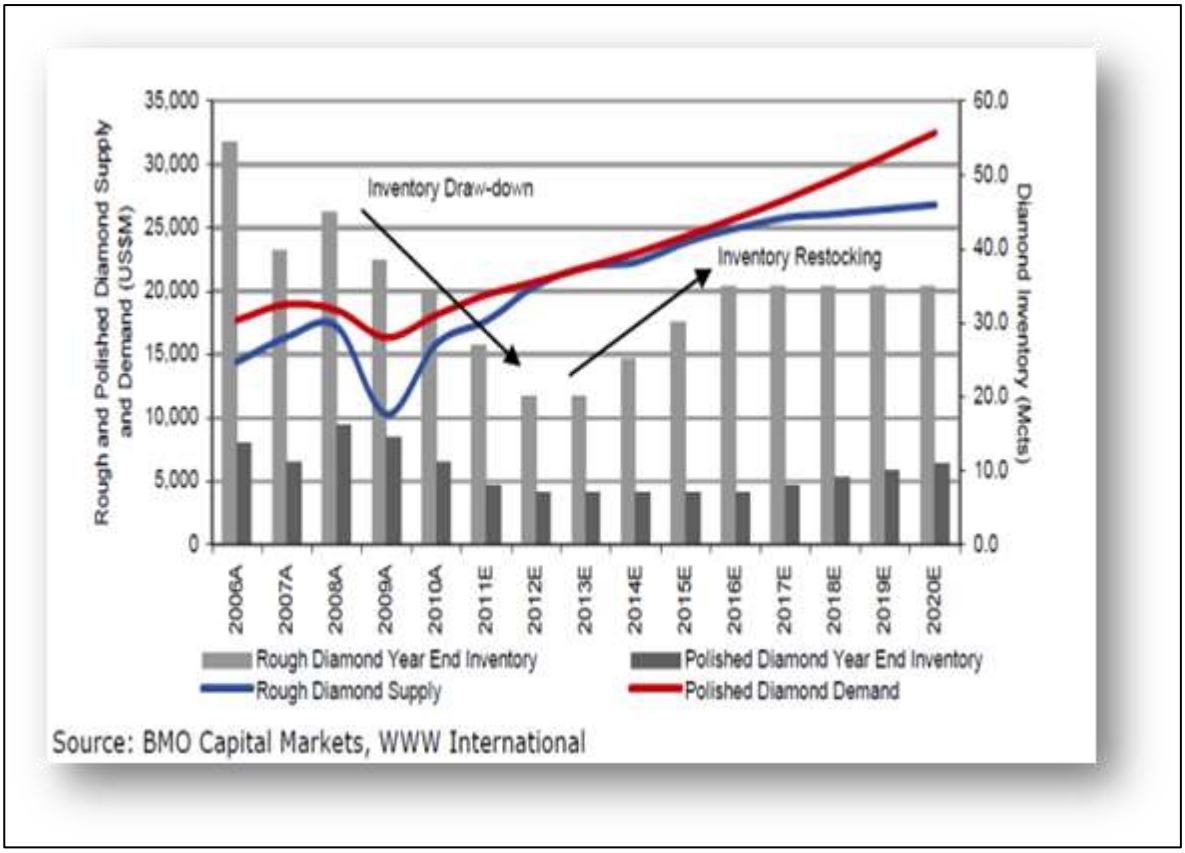


Figure 8. Inventory movements support diamond prices(USDM, Mct)

BMO Capital Markets (Sterck, 2011) estimated at the time that Chinese demand for polished diamonds accounted for 5% or USD1 billion of the market in 2010. While this represents a relatively small proportion of the market currently, growth is extremely strong.

De Beers reported that Chinese demand for polished diamonds grew at 25% in 2010, significantly ahead of GDP growth of 13%. Looking ahead, momentum into 2011 suggests that growth of 15% may be possible. From 2012 onwards, growth in household disposable income is forecast to average 11% to 12% per annum. This translates into minimum growth in diamond demand of 13% per annum.

From 2012 onwards diamond demand is likely to grow in line with economic growth at around 10% per annum. Combining steady demand growth from the established diamond consuming nations and strong growth in demand from emerging consumer's results in a forecast of polished diamond demand almost doubling by 2020, resulting in a total market value of over USD30 billion in nominal terms.

Desirability:

No	Description	Yes/No
1	Does the proposed land use / development fit the surrounding area?	Yes
2	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	Yes

3	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	Yes
4	Will the proposed land use / development impact on the sense of place?	Yes
5	Will the proposed land use / development set a precedent?	No
6	Will any person's rights be affected by the proposed land use / development?	Yes
7	Will the proposed land use / development compromise the "urban edge"?	No

Benefits:

No	Description	Yes/No
1	Will the land use / development have any benefits for society in general?	Yes
2	Will the land use / development have any benefits for the local communities where it will be located?	Yes

g) Period for which the environmental authorisation is required

5 years. With the option of a renewal for another three years if the right is granted.

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

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

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

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

Prospecting Site Location

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

Prospecting infrastructure will be placed strategic by incorporating prospecting project demands, environmental sensitivities and IAP concerns, as identified during EIA process. Thus, the prospecting site location is primarily based on proximity to the access roads, proximity to the areas earmarked for prospecting and limited additional impact on the environment and heritage resource. This renders the consideration of further alternative location in terms of the prospecting site location other than the prospecting residue deposits unnecessary.

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

i) Details of the development footprint alternatives considered

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

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

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

FARM KANNIKWA 156 AND FARM KANNIKWA VLAKTE 157
ADMINISTRATIVE DISTRICT OF NAMAQUALAND
IN EXTENT: 11 873.5649 HA

Alternatives considered:-

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

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

(a) The type of activity to be undertaken:

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed development enables

sustainable development, a number of feasible options must be explored. The various alternatives were assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality the prospecting operation do not form part of the discussion as the location of the prospecting operation is determined by the geological location of the mineral resource (as discussed in section f).

Land Use

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

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

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

Project Infrastructure

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

Prospecting Method

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

Proceed without the Mine (no go)

Land Use

Limited sheep farming is the only feasible form of agriculture here.

Socio-Economy

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

Biodiversity

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

Heritage and Cultural Resources

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

(b) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating prospecting project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for bulk sampling as well as limited additional impact on the environmental (non-perrennial drainage lines and wind direction), heritage resources and discussions with the relevant Departments.

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

- Processing Plant : 2 X 16 feet

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

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

- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
  It is anticipated that the operation will utilize 2 x 23 000 litre diesel tank. This tank must be placed in bund walls, with a capacity of 1.5 times the

volume of the diesel tank. A concrete floor must be established where the re-fuelling will take place.

- Prospecting Area: Area applied for to pit and trench for diamonds (bulk sampling).
- Processing plant:
- Roads (both access and haulage road on the mine site):
  Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 1.5 km of roads. The current access road is deemed adequate for a service road into the prospecting site.
- Salvage yard (Storage and laydown area).
- Product Stockpile area.
- Waste disposal site
  The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:
  - Small amounts of low level hazardous waste in suitable receptacles;
  - Domestic waste;
  - Industrial waste.
- Temporary Workshop Facilities and Wash bay.
- Water distribution Pipeline.
- Water tank : It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

Alternatives considered:-

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

within a concrete bund wall. The final location of the fuel storage tanks will be determined based on proximity to prospecting operations.

In terms of water use alternatives; the operation is not located near any perennial River systems and therefore the only water which can be used will be ground water or sea water. A decision will be made after specialist studies have been conducted. Plastic pipelines are considered to be the best long term option for transferring water, due to their temporary nature which causes minimum environmental disturbances.

If prospecting proves positive a diamond rotary plant will be established which uses (2 X 16 feet rotary pan). Water use for a 16 feet rotary pan is in the order of 18000 litres per hour. The operation will only work in daytime hours which will constitute about 8 hours per day which will bring water consumption to 144000 litres per day and 720 000 litres per week 2880000 litres per month per pan. Total cubic metres tested will be 81206.25 m^3 a 16 feet pan can on capacity work about 65 tons per hour which constitutes about 117m^3 per hour. With new methods developed this use can be much less than mentioned above.

Therefore, a pipeline route will be designed based on the principle of minimum impacts to the environment.

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

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

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

In terms of power generation the options available was for Generators or ESKOM power. All of the electricity needs for the operations will be generated by a diesel

generator and there would therefore be no additional pressure on the Eskom Electricity Grid.

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

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

- Technique

  The area will be excavated (opencast method) with an excavator up to bedrock, stockpiled next to an open area and loaded onto the trucks by a frond end loader. The trucks will transport the gravel via a newly constructed road, which will be constructed to the required safety standard. No provincial roads will be used.
  At the processing plant the run of mine tailings will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening process and transported for delivery to a recovery plant and associated equipment.

- Technology

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

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

(d) The operational aspects of the activity:

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

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

Alternatives considered:-

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

(e) The option of not implementing the activity:

Potential land use includes grazing and prospecting. The majority of the area is classified to have potential for grazing land and suitability for crop yield. Therefore, prospecting activities are believed to be the most economically beneficial option for the area to establish any potential for mineral resources. No agricultural lands will be disturbed.

Socio-Economy

The operation will make provision for 12 - 25 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

The Kannikwa Prospect lies between 6km and 19km from the West Coast of South Africa, and as such forms part of the coastal lowlands, which are bounded on the eastern side by the northsouth trending quartzitic mountain ranges of the Gariep Group and the gneissic mountain land of the Namaqualand Metamorphic Complex.
The coastal lowlands are characterized by pervasive arid windblown sand cover, supporting a sparsely distributed low shrub and bush vegetation. Rainfall is low and vegetation is mainly dependent on coastal fog for moisture intake. Limited sheep farming is the only feasible form of agriculture here.
Closer to the coast, where the prevailing southerly coastal winds are strongest and most of the sand accumulates, large stretches of dune-land are found. The dunes can become higher than ten metres and quite steep, and can therefore not easily be traversed by vehicle. Except for the north-western corner of Kannikwa 156A, the sand on the Kannikwa Prospect is generally 1-3m thick and relatively flat.

Heritage and Cultural Resources

No information is available on any heritage features on the area of application and the necessary specialist studies will be done to be included into the EIA/EMP documents.

Should any other heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located

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

ii) Details of the Public Participation Process Followed

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

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

An Advert (Notice) will be placed in the GEMsbok and should be published between the week of 12 July and 19 July 2021 to notify all other interested and affected parties.

Registered consultation letters were send on 12 July 2021 to all identified parties and government departments with the Scoping Report on disc included.

The document will also be made available at the public library in Port Nolloth if possible.

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

iii) Summary of issues raised by I&APs

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

Table 3: Summary of issued raised by I&Ap

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 issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
AFFECTED PARTIES					
Landowner/s	**X**				
KANNIKWA DIAMOND AND ESTATE CORP LTD Tel no 027 8518527 Fax no: 027 8518527 Cellular no 0026464407111 E-mail address pieterkotze777@hotmail.com	X				
Richtersveld Municipality 027 851 1111 Contact Details Postal Private Bag X113, Port Nolloth, 8280 Physical 169 Main Road, Port Nolloth Tel 027 851 1111 Fax 027 851 1101 Web www.richtersveld.gov.za	X				

Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	**X**				
Municipal Councillor	**X**				
Municipality	**X**				
Richtersveld Municipality 027 851 1111 Contact Details Postal Private Bag X113, Port Nolloth, 8280 Physical 169 Main Road, Port Nolloth Tel 027 851 1111 Fax 027 851 1101 Web www.richtersveld.gov.za	X				
Namaqualand District Council Private Bag X20 Springbok 8240	X				
Organs of State (Responsible for infrastructure that may					

be affected Roads Department, Eskom, Telkom, DWA					
ESKOM Environmental Division P O Box 356 Bloemfontein 9300 Ms A van Gensen	X				
ESKOM Holdings SOC Limited Northern Cape Operating Unit: Land Development PO Box 606 Kimberley 8300	X				
SANRAL PO Box 415 Pretoria 0001	X				
Transnet PO Box 72501 Parkview 2122	X				
NC Department of Roads and Public Works PO Box 3132 Squirehill Park Kimberley 8300	X				
Communities					

No Communities					
Dept. Land Affairs					
Department of Agriculture, Land Reform and Rural Development P O Box 5018 Kimberley 8300	X				
Department of Rural Development and Land Reform PO Box 5026 Kimberley 8300	X				
Department of Cooperative Governance, Human Settlements and Traditional Affairs Private Bag X5005 Kimberley 8300	X				
Traditional Leaders					
No Traditional Leaders					
Dept. Environmental Affairs					
Northern Cape Department of Environment and Nature Conservation Private Bag X6102 Kimberley 8300	X				

Tel: 053 807 7430 Fax: 053 831 3530					
Other Competent Authorities affected					
Department of Water and Sanitation Private Bag X6101 Kimberley 8300	X				
SAHRA P.O. Box 4637 Cape Town 8000	X				
National Dept. of Public Works Private Bag X5002 Kimberley 8300	X				
Department of Agriculture, Forestry and Fisheries PO Box 2782 Upington 8800	X				
OTHER AFFECTED PARTIES					
None					
INTERESTED PARTIES					
None					

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

(1) **Baseline Environment**

(a) Type of environment affected by the proposed activity (its current geographical, physical, biological, socio-economic, and cultural character)

(1) *GEOLOGY:*

Geological Overview

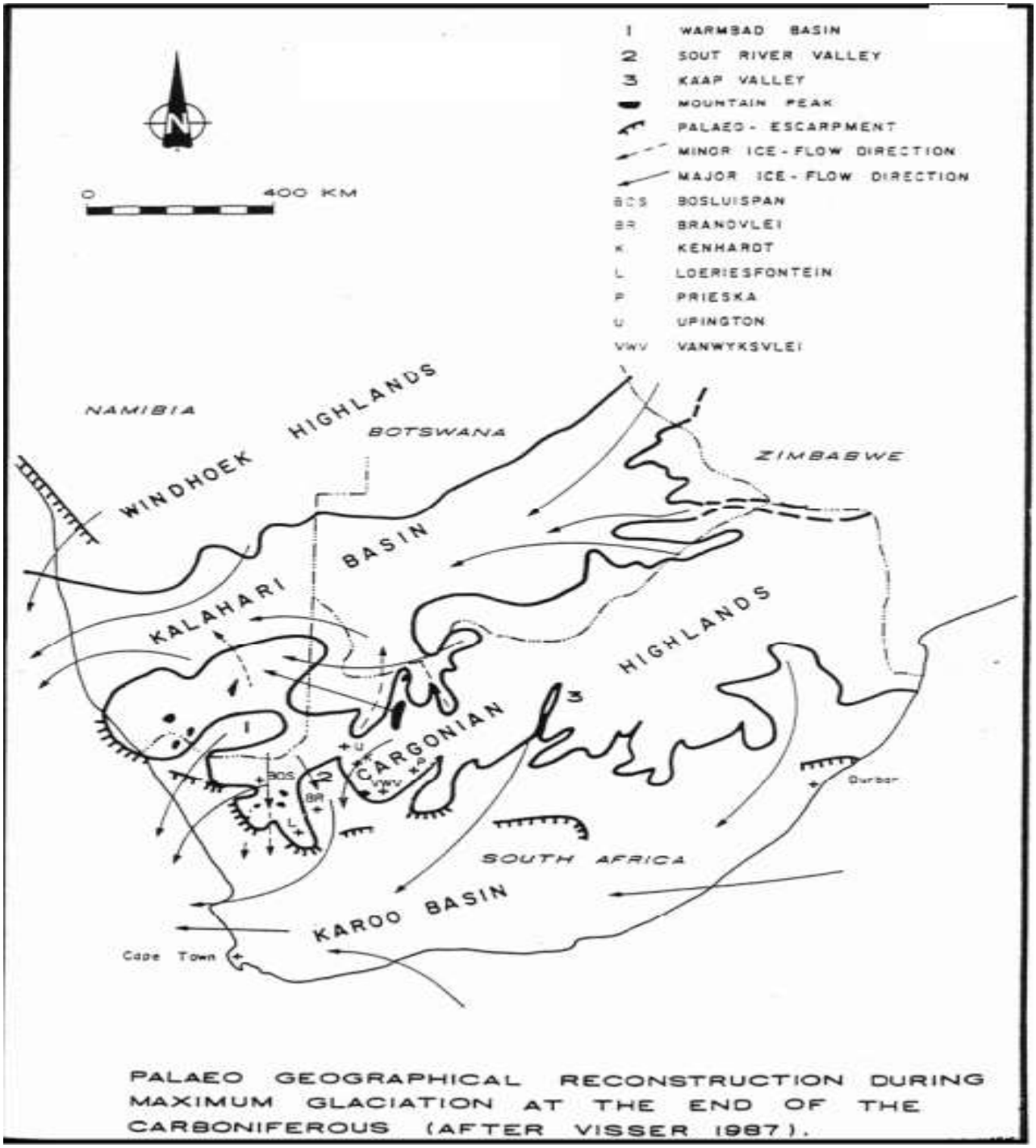
Namaqualand forms the north-western flank of the Namaqua-Natal Mobile Belt, a zone of intensified tectonic activity surrounding the relatively stable Kaapvaal Craton on its south-western side. As such, the Namaqualand Metamorphic Complex forms the fundamental basement of all rock successions in Namaqualand.

In the north-western parts of Namaqualand, a eugeoclinal phase ensued 700-590 million years (Ma) ago, producing a series of deep basins into which the thick sedimentary successions of the Gariep Supergroup were laid down. Quartzites and schists of the Vredefontein Formation as part of the Stinkfontein Subgroup as part of the Port Nolloth Group are the predominant bedrock types on Kannikwa 156.

During the period 510-350 Ma ago, folding took place and faulting continued in Namaqualand, and the rivers of a more humid climate carved deeply incised valleys into the displaced landscape. This relief was prominently deepened and widened by the gigantic glaciers of the Carboniferous period, which laid down the Dwyka Formation in huge valleys and over vast stretches of the Cargonian Highlands between 350 and 290 million years ago (see Figure 9).

The Dwyka glaciation marked the end of large-scale basinal sedimentation in Namaqualand, and during the ensuing 290 million years up to present, the balance of the scale was on the erosional side. This is the time during which the bulk of the diamondiferous deposits of Namaqualand were released from their glacial sources and laid down in river basins (Maree, 1987).

The oldest known unmetamorphosed sediments in this area are the Cretaceous silcretes and remaining patches of silicified diamond conglomerate of Late Cretaceous age (~70 Ma), found on Annex-Kleinsee. Coastal river palaeo-channel deposits are mainly of Tertiary age, while raised beach terraces mined on the coastal farms, were formed during sea level stillstands since early Miocene and throughout the Quaternary period (Kensley & Pether, 1986).



PALAEO GEOGRAPHICAL RECONSTRUCTION DURING MAXIMUM GLACIATION AT THE END OF THE CARBONIFEROUS (AFTER VISSER 1987).

Figure 9. The Cargonian Highlands (after Visser, 1987).

Regional Structure

After Carboniferous and Mesozoic deposition of the Karoo sediments, the break-up of Gondwanaland ensued with a series of tension fracture faults, mostly north-south trending in this part of the subcontinent. It was during this period (~180–120 Ma ago), that most of the faults on Kannikwa 156 and surrounds were born. Although folding and faulting on Kannikwa 156 is mostly obscured by sand cover, it is assumed that they are

more or less coast-parallel as are the faults in Fyftienmyl se Berge toward the east, the most prominent of which is the Gemsbokvlei Fault.

The displacement and extent of these faults are unknown, except for the observation that the fault bisecting the excavated proto-gravel on the southern slope of the palaeo-Kamma River valley at KA1_002 displays a vertical displacement of at least 14 metres.

Large boulders of silicified / ferrugenized fault breccia occur against the side of a hill in the middle of Kannikwa 156, directly south of the old commonage where the old railway line once crossed. Similar breccia is found about 1.5km south-southwest, which shows that approximately northsouth trending faults are fairly common on Kannikwa 156. Most of them are presumed to have relatively small displacements.

Folding in the area seems to be very gentle and on a large (geosynclinal) scale in the region as a whole. Folding seems to be mainly coast-parallel and syngenetic with the Gariep. Other trends, though less likely, is also possible. Later Triassic folding seems not to have influenced this region significantly.

The Kannikwa Diamond Prospect lies in the heart of the world renowned Namaqualand Diamond District, bordered by the colossal De Beers Namaqualand Mines diamond works at Kleinzee to the south, and the enormous Alexkor diamond works at Alexander Bay to the north and to the west. Farther afield Trans Hex have mined diamonds on a massive scale along the Lower Orange River and Namdeb (De Beers) have produced millions of carats from the Southern Namibian beaches.

The Kannikwa Prospect is a well-known part of the diamond landscape along the West Coast of South Africa, lying ~10km directly east of the coastal town of Port Nolloth, almost midway between the Orange River to the north and Buffels River to the south. The Prospect consists of two large adjacent farms, namely Kannikwa 156 and Kannikwavlakte 157, with a total surface area of 11872.4243 hectares (118.72km^2). Various infrastructure is available at Port Nolloth.

The ~140km stretch of coast between Alexander Bay and Kleinzee with adjacent emerged marine terraces has been the mainstay of the Namaqualand alluvial diamond district for the greatest part of the twentieth century. Although this immense wealth has mainly been mined out by 2008, a considerable proportion of viable deposits remains and is still being mined on a fairly substantial scale. Due to the sheer scale and abundance of viable deposits, the first and foremost focus has for decades been on the central deposits surrounding the Buffels and Orange River mouths.

However, through further study of the drainage patterns, several adjacent deposits which have been known but escaped scrutiny until recently are now regarded as the conduits and main contributors to many of the rich central deposits. The main conduit for the extensively mined Port Nolloth Reserve 155 and Oubeep areas is considered to

be the palaeo-Kamma River, which runs across Kannikwa 156. In this regard, the Kannikwa Prospect is considered one of the most promising remaining stretches of diamond land in the Northern Namaqualand diamond province.

Regional Structure

After Carboniferous and Mesozoic deposition of the Karoo sediments, the break-up of Gondwanaland ensued with a series of tension fracture faults, mostly north-south trending in this part of the subcontinent. It was during this period (~180–120 Ma ago), that most of the faults on Kannikwa 156 and surrounds were born. Although folding and faulting on Kannikwa 156 is mostly obscured by sand cover, it is assumed that they are more or less coast-parallel as are the faults in Fyftienmyl se Berge toward the east, the most prominent of which is the Gemsbokvlei Fault.

The displacement and extent of these faults are unknown, except for the observation that the fault bisecting the excavated proto-gravel on the southern slope of the palaeo-Kamma River valley at KA1_002 displays a vertical displacement of at least 14 metres.

Large boulders of silicified / ferrugenized fault breccia occur against the side of a hill in the middle of Kannikwa 156, directly south of the old commonage where the old railway line once crossed.

Similar breccia is found about 1.5km south-southwest, which shows that approximately northsouth trending faults are fairly common on Kannikwa 156. Most of them are presumed to have relatively small displacements.

Folding in the area seems to be very gentle and on a large (geosynclinal) scale in the region as a whole. Folding seems to be mainly coast-parallel and syngenetic with the Gariep. Other trends, though less likely, is also possible. Later Triassic folding seems not to have influenced this region significantly. Information take out of the First Phase drilling report on the prospecting of the Kannikwa alluvial diamond prospect east of Port Nolloth, Northern Cape prepared for Magalodon Diamond Exploration by Creo Design (Pty) Ltd, August 2008.

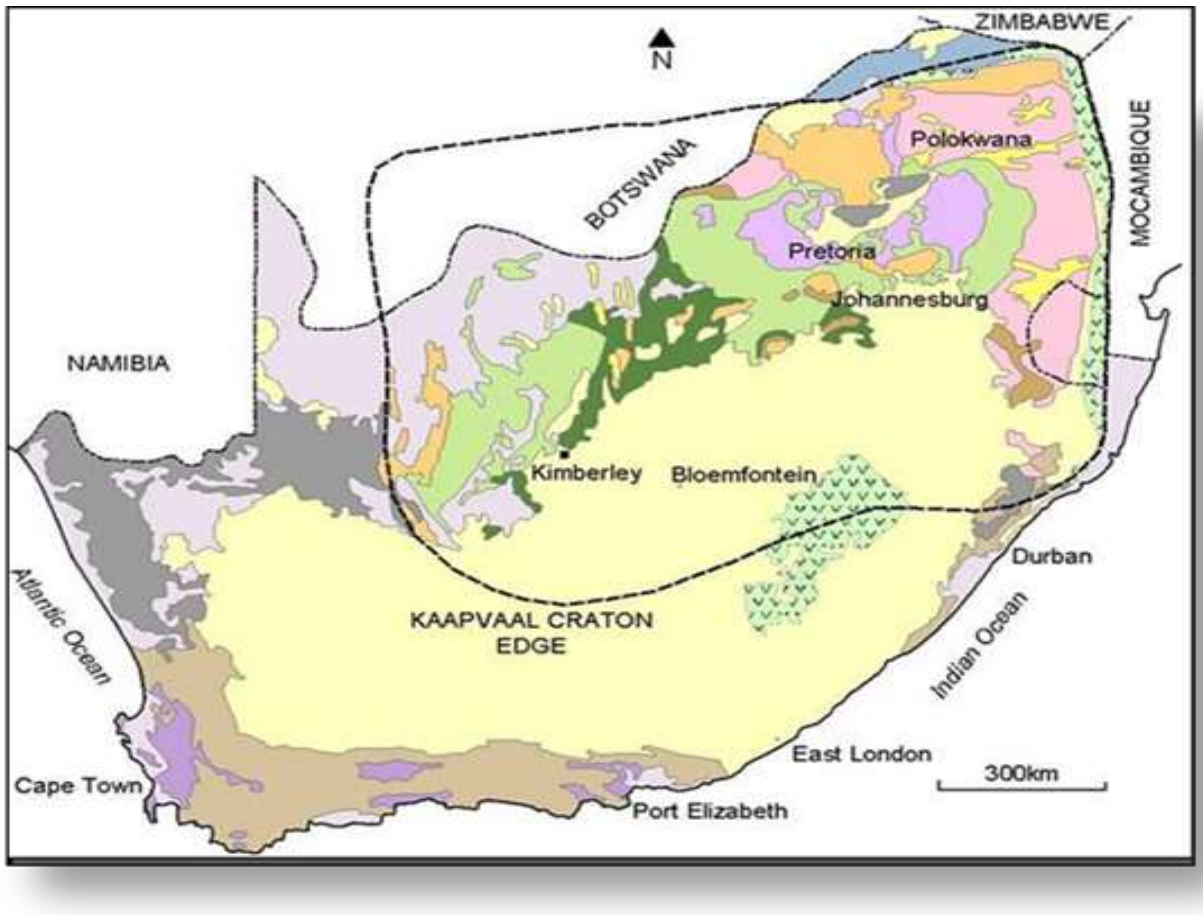


Figure 10. General Geology of South Africa (Gurney, et al., 1991)

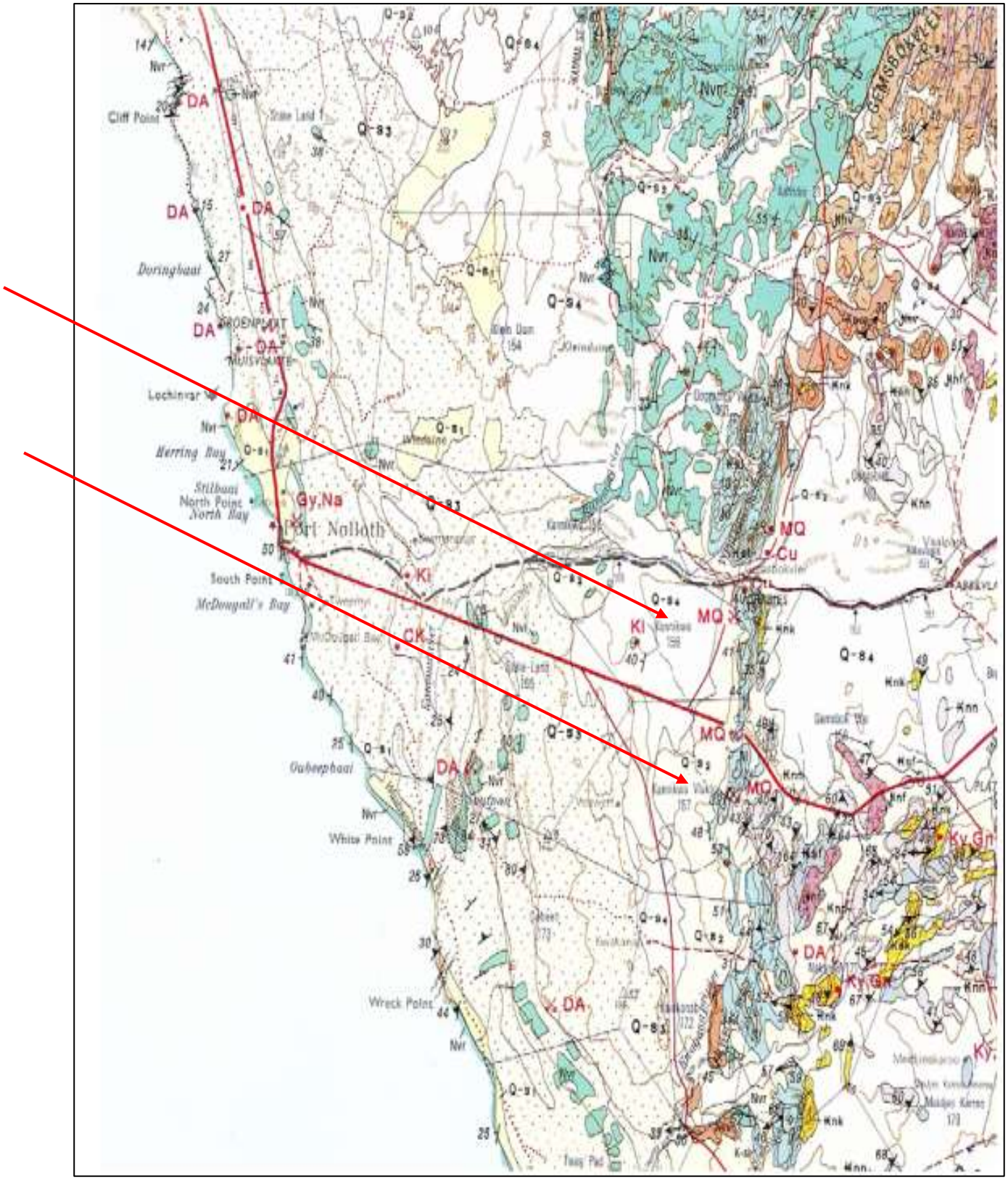


Figure 11. - ***Extract from 1:250 000 geological map (Council for Geoscience, Pretoria) showing location of the farms Kannikwa Blue (Vgd) = Campbellrand Subgroup comprises of coarse to fine grained dolomite and limestone, Grey (C-Pd) = Dwyka Group, Yellow (T-Qc) = Neogene calcrete, Pale yellow (Qs) = Quaternary to Recent sands and sandy soil of the Gordonia Formation (Kalahari Group). DK marks Diamond in Kimberlite.***

(2) CLIMATE:

The site falls within the west coast desert climatic zone of Southern Africa, which is typified by hot dry summers and cooler winters with little rain. The nearest town to the mining site is Springbok. Springbok lies on 982m above sea level Springbok's climate is a local steppe climate. There is not much rainfall in Springbok all year long. According to Köppen and Geiger, this climate is classified as BSk.

Rainfall is less than 200mm a year and falls during the autumn and winter months (ie from May to August). Coastal fogs occur year round but are more frequent during the winter period. Temperatures are relatively cool but increase markedly during berg wind conditions. The predominant wind direction is southerly.

Average temperatures measured for Springbok ranges from 22.3 ℃ in the hottest month, February, to 11.4 ℃ for the coldest month, July. The average temperatures measured for all of the months can be seen in the table below.

Table 4: Average temperatures and rainfall measured for every month.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	22	22.3	21.4	18.1	14.6	11.9	11.4	12	14.3	16.7	19.3	20.8
Min. Temperature (°C)	14.7	15.1	14.6	11.6	8.4	6.4	5.8	5.9	7.6	9.7	12	13.5
Max. Temperature (°C)	29.4	29.6	28.3	24.7	20.8	17.4	17	18.1	21.1	23.7	26.7	28.2
Avg. Temperature (°F)	71.6	72.1	70.5	64.6	58.3	53.4	52.5	53.6	57.7	62.1	66.7	69.4
Min. Temperature (°F)	58.5	59.2	58.3	52.9	47.1	43.5	42.4	42.6	45.7	49.5	53.6	56.3
Max. Temperature (°F)	84.9	85.3	82.9	76.5	69.4	63.3	62.6	64.6	70.0	74.7	80.1	82.8
Precipitation / Rainfall (mm)	4	6	11	19	25	32	30	27	12	12	5	6

Rainfall

The rainfall in the area is low. The two closest station is in Springbok which is 50km away. The annual rainfall in Springbok is around 189 mm. The daily rainfall data for Springbok have been summarized to represent the average monthly rainfall, which is graphically presented in Figure 12 below.

Precipitation for the region is the lowest in January with an average rainfall of 4 mm during this month. During the month of June, the precipitation reaches a peak with an average of 32 mm. The difference in precipitation between the driest and wettest months is thus 28 mm.

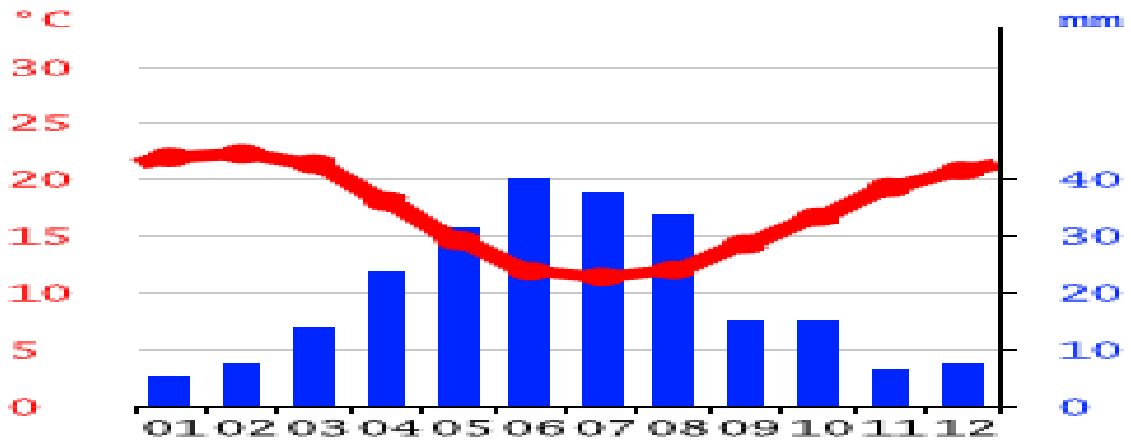


Figure 12. Average rainfall and temperature per month at the nearest rainfall station (Springbok).

Evaporation

Evaporation far exceeds rainfall at the site. Although no records are available from the mine site the gross annual evaporation rate at Springbok is on average 3254 mm.

Wind

Prevailing winds are determined by the South Atlantic high pressure system, the atmospheric pressure over the subcontinent and east-moving low pressure systems associated with the west-wind belt south Africa.

The anticlockwise airfow around the South Atlantic high tends to be guided by the coast, so that near the coast the wind is predominantly from the south (onshore). In winter the winds decrease considerably and blow more frequently from the north. Berg winds are a feature of the entire Benguela region and may occur throughout the year, but are more frequent in winter. The wind is hot and dry and usually blows from the east or north east.

Incidents of Extreme Weather Conditions

Extreme weather conditions are rare and in general the coastline climate is fairly consistent. Winds occasionally reach gale force velocity and berg wind conditions can persist for a week or longer, causing higher than usual temperatures. Drough conditions are rare and rainfall is usually higher than average once every 10 years causing ephemeral rivers to flow.

(3) *TOPOGRAPHY:*

Topographically, Kannikwa 156 is dominated by the Kamma River valley, which enters at the northeastern corner of the farm from a northerly direction, and

then turns west-southwestward, running through the farm to exit along the northern part of the western border (see Figure 13).

The ground south-southeast of the Kamma River valley climbs gradually toward the foot of Vyftienmyl se Berge, part of the Lekkersing Formation to the east. A break in Vyftienmyl se Berge at Gemsbokvlei homestead provides fluvial access to Kannikwa 156 from the east, but the diamond potential of this route needs to be established at a later stage.

The fairly flat, even surface of most of the central part of Kannikwa 156, belies the intensively incised and scoured fluvial bedrock morphology which lies underneath.

The coastal lowland rises gently from the sea to approximately 150m. Over this area it is generally gently undulating hilly topography with scree filled valleys and gneiss kopjes. The Great Escarpment marks the eastern border of the coastal plain. Closer to the coast, predominantly southerly winds have played a major part in moving sediments northwards and inland. Dune fields and blow-out depressions are common. Sparse rock outcrops have been subject to wind erosion and sandblasting.

Figure 13. Google Earth View of the entrance of the Kamma River into Kannikwa 156.

(4) SOILS:

Aeolian sands with a marine origin of various ages covers most of the Namaqualand coastal plain. The interior sands are characterised by reddish consolidated sands with a pedogenic mud content as subsoil that are less mobile as a result of cementation and vegetation processes. Deeper sediments include terrigenous feldspathic sands grading upwards into reddish or brownish silty sands. Calcrete occasionally separates these deeper sands from the shallower overlying Aeolian sands. The reddish color of the sand is a result of iron oxidation in the older sands. Deeper sediments are sodic and salinity increases with depth as a result of their marine origin.

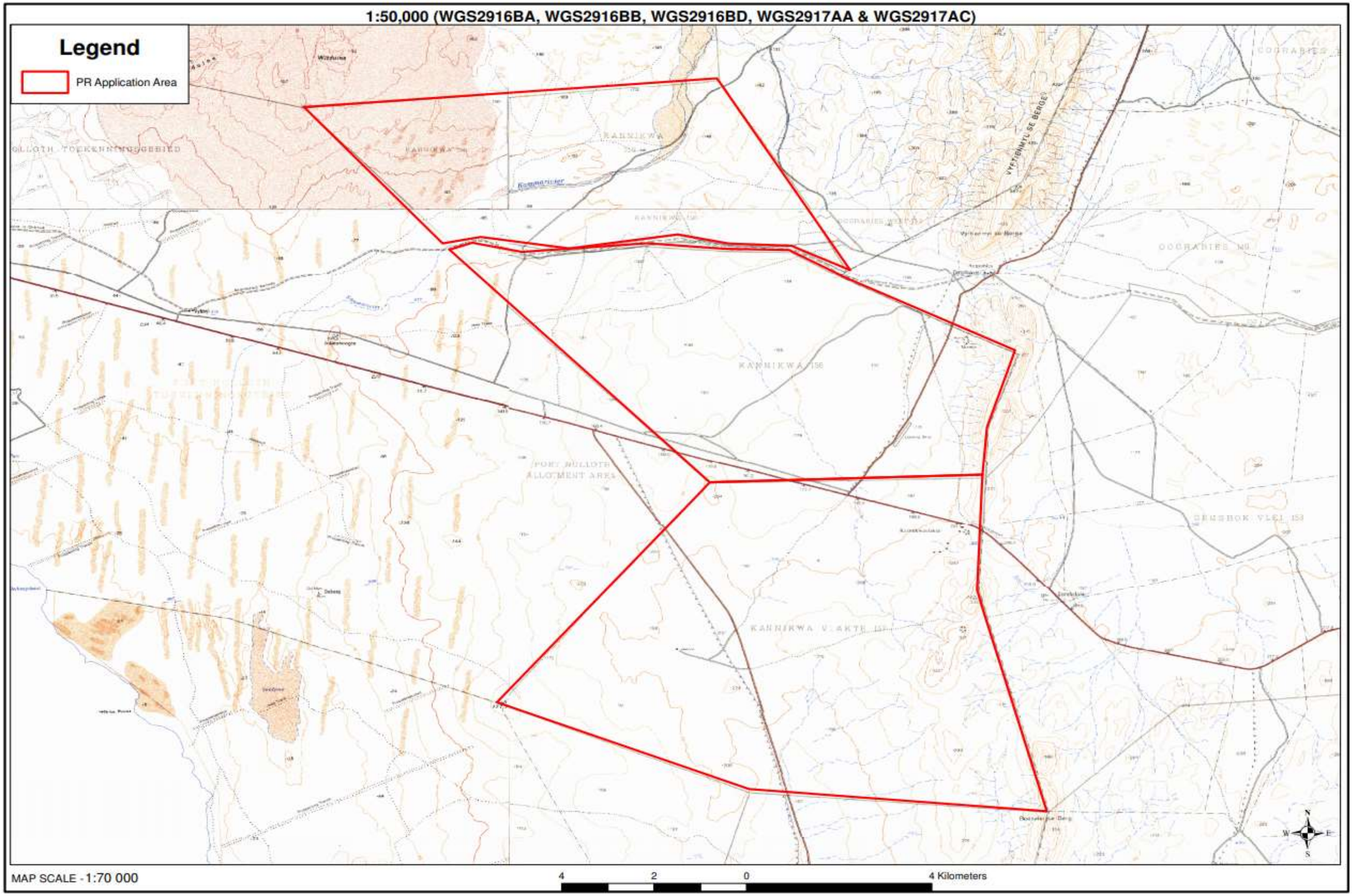


Figure 14. 1:70 000 image of Kannikwa, Namaqualand

(5) LAND CAPABILITY AND LAND USE:

Limited sheep farming is the only feasible form of agriculture here.

Land Use before Prospecting

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

Evidence of Disturbance

Old timers mining activities have caused a degree of disturbance in the area.

Existing Structures

The prospecting area has a series of access roads, farm houses, stores.

(6) *NATURAL FAUNA:*

Steenbok, duiker and meerkat are encountered in the mining areas. Occasionally, African wild cat, black backed jackal, bat-eared fox and yellow-tailed mongoose can be seen.

The areas supports a high proportion of species endemic to southern Africa, especially in its inland avifauna. Ludwig's burtard, Martial eagle Caspian, Antarctic and Dmara terns are Red Dataspecies occurring in the area. Some of the species most likely to be encountered year-round are:

- Terrestrials such as Kori and Ludwig's bustards and Southern Black Korhaan, Which are often flushed from the shrubs in the nature reserve;
- Raptors such as Southern Pale chanting Goshawk and Jackal Buzzard;
- Insect -eaters such as Karoo Scrub-Robin and Karoo Prinia; and
- Nectar-feeders such as Southern Double-collared and Malachite sunbirds

Other key birds occurring in the area include Barlow's Lark, Cape Eagle-Owl, Black necked Grebe, Cape Penduline-Tit, Cape Long-billed Lark, Chat Flycatcher, Tractrac Chat, Black-headed Canary, Lesser Swamp Warbler, Little Rush Warbler, Grey-backed Cisticola, Bokmakierie, Large-billed Lark, Layard's Tit Babbler, Dusky Sunbird, Pale-winged Starling and Lark-like Bunting.

In the Succulent Karoo Biome, the largest proportion of endemic animal species is represented by reptiles. Of the forty-five species of reptiles known to occur in this biome, a tortoise, two snakes, seven legless skinks, seven lizards, one gecko

and one chameleon species are endemic. Red Data species include the Namaqua dwarf adder (Bitis schneiden) and the desert rain frog (Breviceps macrops).

No freshmwater fish species occur, due to the absence of permanent suface (fresh) water in the region and surf angling catches along the coast from Groen River to Port Nolloth are known to be very poor. The West Coast rock lobster (Jasus lalandii), a member of the group of spiny lobsters, is the primary species of the commercial rock lobster industry in South Africa.

In addition the Namaqualand coast is home to a diversity of invertebrate species, however the insect fauna of Southern Africa and particularly the West Coast is poorly known.

7) **Flora:**

The Kannikwa Prospect lies between 6km and 19km from the West Coast of South Africa, and as such forms part of the coastal lowlands, which are bounded on the eastern side by the north-south trending quartzitic mountain ranges of the Gariep Group and the gneissic mountain land of the Namaqualand Metamorphic Complex.

The coastal lowlands are characterized by pervasive arid windblown sand cover, supporting a sparsely distributed low shrub and bush vegetation. Rainfall is low and vegetation is mainly dependent on coastal fog for moisture intake. Limited sheep farming is the only feasible form of agriculture here.

Closer to the coast, where the prevailing southerly coastal winds are strongest and most of the sand accumulates, large stretches of dune-land are found. The dunes can become higher than ten metres and quite steep, and can therefore not easily be traversed by vehicle. Except for the north-western corner of Kannikwa 156A, the sand on the Kannikwa Prospect is generally 1-3m thick and relatively flat.

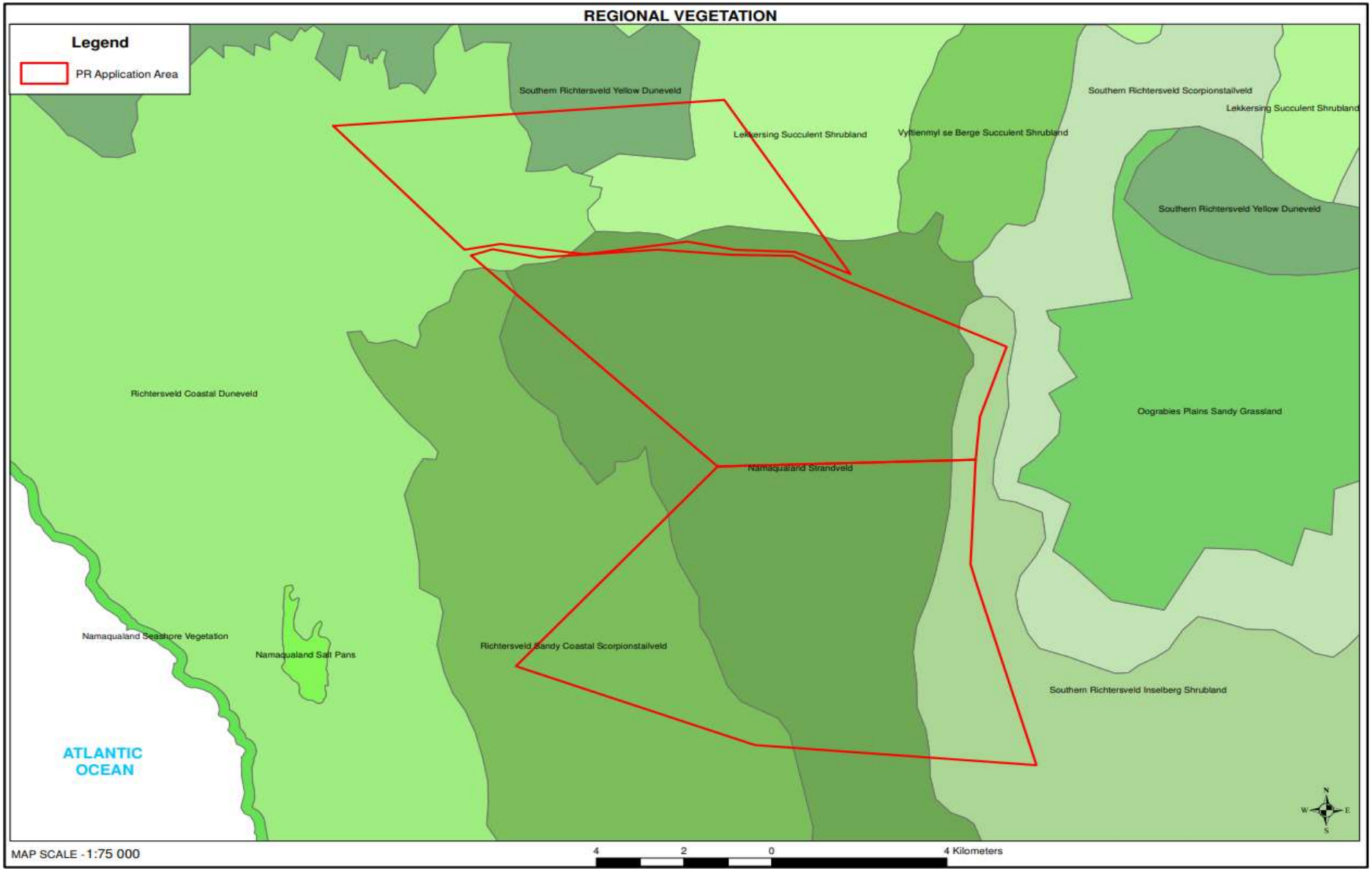


Figure 15. Regional Vegetation Map, the application area is indicated in red.

(*8*) *SURFACE WATER*

The MAR is in any event very low given the low rainfall less than 200 mm per year occurring mainly in the winter months, high evaporation rates, and shallow grade of the slope toward the drainage channels and the permeability of the soils The surface water quality (when available) is suitable for animal consumption but not for potable water.

A number of drainage lines are present on the site, all of which are non-perennial.

The drainage lines in the area will only carry water during exceptional rainfall events such as a big cloudburst, experience a flash run-off and be dry again after the run-off except for possible hollows in the drainage lines. Evaporation is high and surface water is hardly encountered in this area.

There is no normal flow in dry weather conditions – it is devoid of any water.

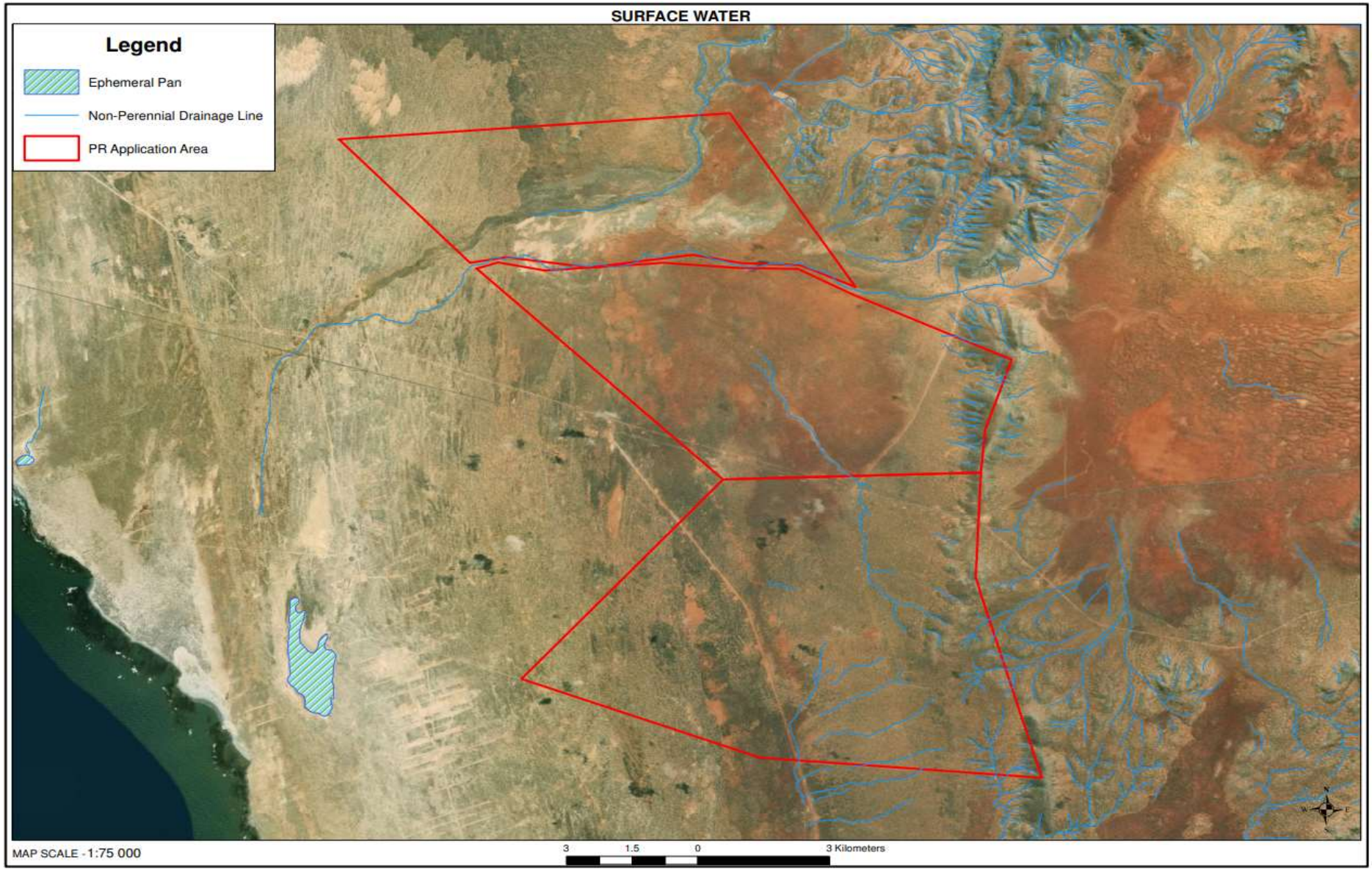


Figure 16. See dry Non- Perrennial Drainage channels indicated in blue on the proposed Prospecting area.

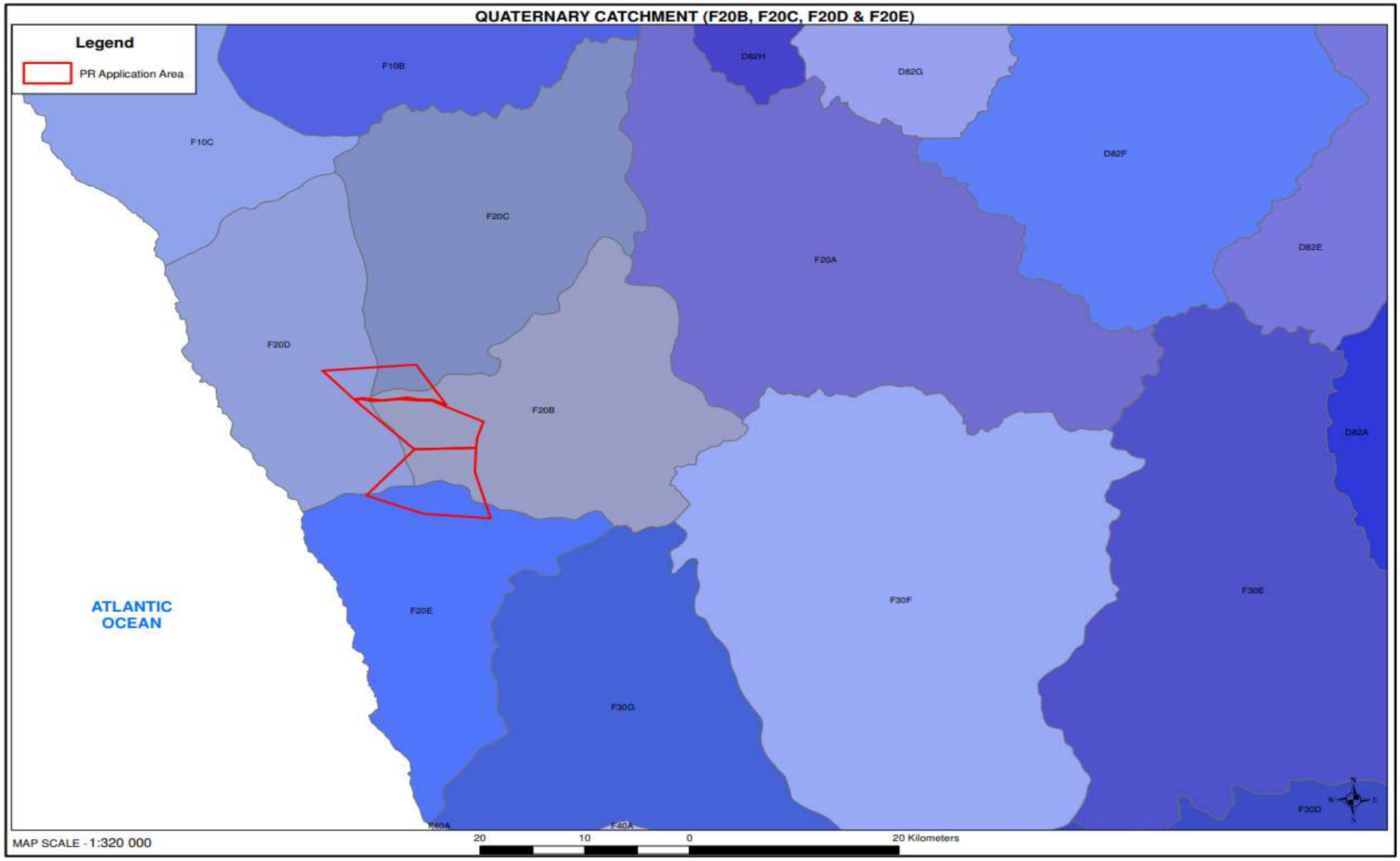


Figure 17. Catchment area

Classification of the Watercourse

The study area straddles quaternary drainage catchments F20B, F20C, F20D and F20E of the Orange Water Management Area. The topography is characterized by very flat terrain with ground elevation lying between 1000 and 1 050 metres above mean sea level. Surface drainage is predominantly to the west towards the ocean through the natural drainage channels.

Wetlands

No wetlands other than the natural drainage lines described above are present on the prospecting property.

(9) *GROUND WATER:*

(1)

Joints and fractures often occur at contacts between different geological units, such as between metamorphic rocks of the Okiep Group (Mc) and the gniesses of the Little Namaqualand (MI) and Hoogoor (Mho) Suites respectively, and between the diamictite of the Dwyka Group (Mc). These contact zones can be utilized for groundwater development.

(2)

Groundwater can often be found in joints and fractures at the contracts of different layers within a geological unit, such as the contacts between the quartzite, conglomerate, arkose and schist of the Stinkfontein Formation (Nst), gneiss, quartzite and schist of the Okiep Group (Mc), tillite and occasional lenses of sandstone and shale of the Dwyka Group (C-Pd), and between the shale and subordinate sandstone of the Ecca Group(Pe)

(3)

Sand-and gravel-filled palaeo-channels on the costal flats can be used for groundwater development. As these features are covered with sand, exploration is needed to locate them

(4)

Weathered zones, especially when in the form of basins of weathering in crystalline rocks of the Okiep Group (Mc) and Little Namaqualand Suite (MI), can be targeted for generally limited groundwater development

(5)

Occasional shear zones have relatively good groundwater potential and yields in excess of 0,5l/s can be obtained in these features

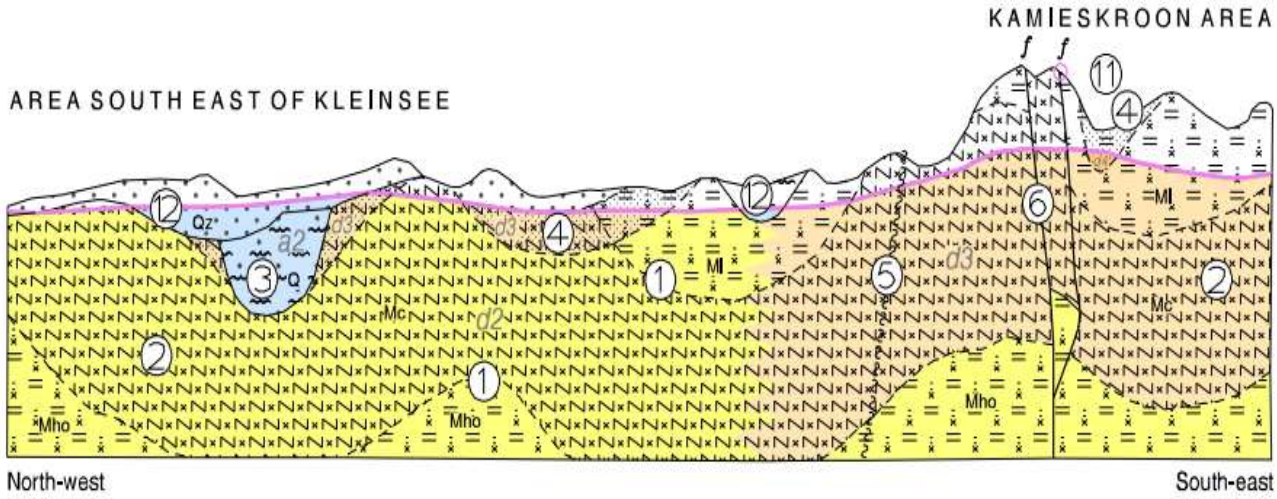


Figure 18. Ground-water zone

Ground-water zone:

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

(10) ***AIR QUALITY AND NOISE:***

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

Existing Sources

The air background quality is very good due to low industrial activity and very low population density. Given the surrounding extent of semi-desert, dust generation is high under windy conditions (dust storm) however under normal conditions no extreme dust conditions are noted on site.

New source

The source of air pollution on the farm will be nuisance dust generated by the opencast Prospecting process, the loading of gravels onto the transport trucks, the dumping of gravels over each sites primary screen or feeder bins as well as from the movement of trucks and vehicles on the prospecting roads. Gas emissions from machinery will be within legal limits.

Areas of impact

The wind is predominantly from the south (onshore). In winter the winds decrease considerably and blow more frequently from the north. Berg winds are a feature of the entire Benguela region and may occur

throughout the year, but are more frequent in winter. The wind is hot and dry and usually blows from the east or north east., there is a potential for fall-out dust to impact on the surrounding farm properties, which can be described as the nearest potential area of impact. The dust management programme recommended should include daily dosing of access roads and stockpile areas

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

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

Noise

Existing sources:

Noise on site will come from the large vehicles (tip trucks, front-end loader, back actor), from the working pan.

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

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

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

(11) VISUAL ASPECTS:

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

(12) AREAS OF CULTURAL-HISTORICAL OR ARCHAEOLOGICAL INTEREST

It is not certain if any areas of cultural-historical value is present on the prospecting right area. An archaeologist will be contacted to do a a heritage survey and this will be submitted as soon as it has been received with the EIA EMP documents as well as a desktop palaeontological study.

(13) *BROAD-SCALE ECOLOGICAL PROCESSES:*

Transformation of intact habitat on a cumulative basis could contribute to the fragmentation of the landscape and could potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations.

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

Richtersveld Municipality is one of six Category B Local Municipalities which form part of the broader Namakwa District as per the Municipal Demarcation Act.

Richtersveld Municipality is an administrative area in the Namakwa District of the Northern Cape Province. The Richtersveld is a unique landscape surrounded by a variety of contrasts.

In Port Nolloth is the ocean, at Alexander Bay there is the Orange River, and at Lekkersing and Eksteensfontein there is underground water that is a little brackish. Rainfall is minimal and water is a scarce commodity, yet the vast plains, which are considered a special place by some, are still a very beautiful region with unique characteristics that attract thousands of tourists. The Richtersveld is a conservation area.

The main economic sectors are: mining, agriculture, fishing and tourism. The area includes a number of big rural areas, as well as the following towns: Port Nolloth, Alexanderbay, Sanddrift, Kuboes, Eksteenfontein and Lekkersing.
A distinct geographical feature of the Municipality is that it is located at the north-western most tip of the Northern Cape Province, South Africa and the African continent. The under mentioned illustration puts the geographic location of Richtersveld Municipality into perspective and also indicates the

location in relation to the Namakwa District. The map below depicts the vastness of the Richtersveld and the towns it consist of.

RICHTERSVELD AT A GLANCE
DEMOGRAPHIC ANALYSIS

Richtersveld Municipality consists of 4 wards. The wards include the following towns & settlements.

Ward	Area
1	Kuboes, Eksteenfontein & Lekkersing
2	Alexanderbay, Beauvallon & Sanddrift
3	Sizamile and part of town, Nollothville
4	McDougallsbay, Parts of Nollothville and town including the central business section

Port Nolloth is the main economic centre of the Municipality and is also the town where the head office of the Richtersveld Municipality is situated. Richtersveld Municipality had a total population of 11982 in 2011. Similar to other rural municipalities, Richtersveld Municipality has also experiences common challenges such as skew patterns of wealth distribution, relatively high levels of unemployment and crime.

The recent mine closure of Transhex Operations in Ward 2 has negatively impacted on the economic activities and income of people.

The total population is Richtersveld Municipality is 12487.

Table 5. shows that the population of Richtersveld has increased from 11982 persons in 2011 to 12 487 persons in 2016.

Percentage distribution of the population in Richtersveld by sex, 2016

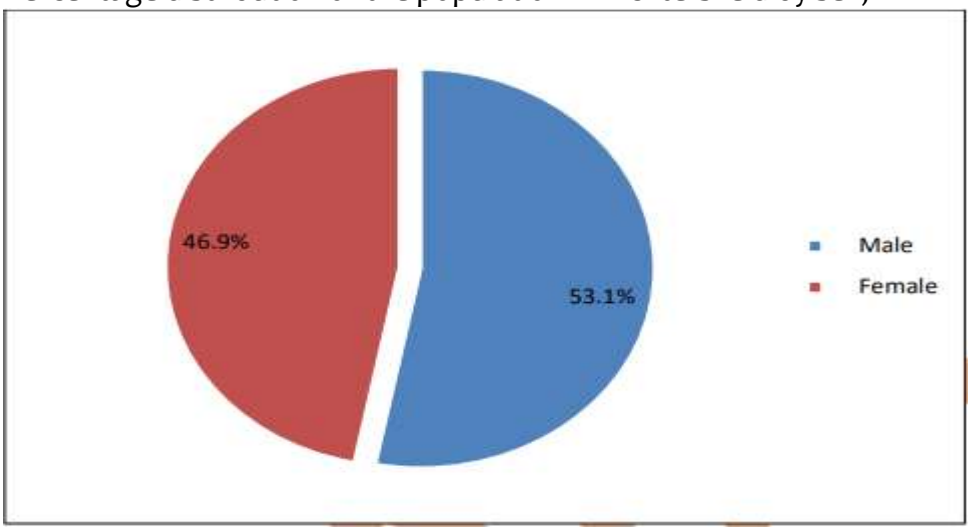


Figure 19. depicts a greater proportion of males than females in Richtersveld, at 53.1% and
46.9% respectively.

Population per town in Richtersveld

Town	Households	Town	Population
Kuboes	235	Kuboes	823
Eksteenfontein	125	Eksteenfontein	719
Lekkersing	118	Lekkersing	765
Sanddrift	260	Sanddrift	858
Alexanderbay	411	Alexanderbay	1760
Port Nolloth	3405	Port Nolloth	7562

Distribution of the population of Namakwa district by local municipality, 2016

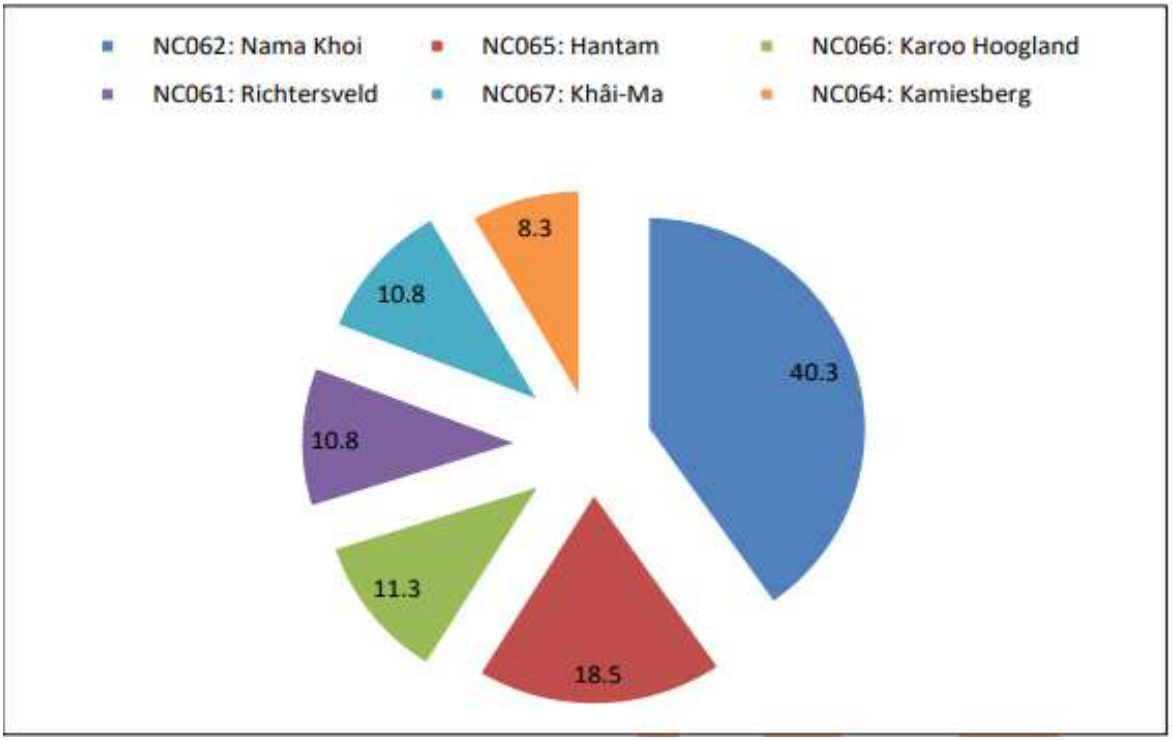


Figure 20. above indicates that Nama Khoi municipality had a 40.3% share of the total population in Namakwa district. This was followed by Hantam, Karoo Hoogland, Richtersveld, Khâi-Ma and Kamiesberg local municipalities with 18.5%, 11.3%, 10.8%, 10.8 and 8.3% respectively of the total district population.

Population by group type, 1996-2016

	1996	2001	2011	2016
Black African	1 000	1 117	1 568	1 173
Coloured	9 540	7 769	9 178	10 347
Indian or Asian	18	15	58	50
White	2 164	1 223	1 013	917
Other	-	-	165	-
Unspecified	98	-	-	-
Total	12 819	10 125	11 982	12 487

Table 6 summarizes the number of persons by population group from 1996 to 2016.
Percentage distribution of the population by group type, 2016

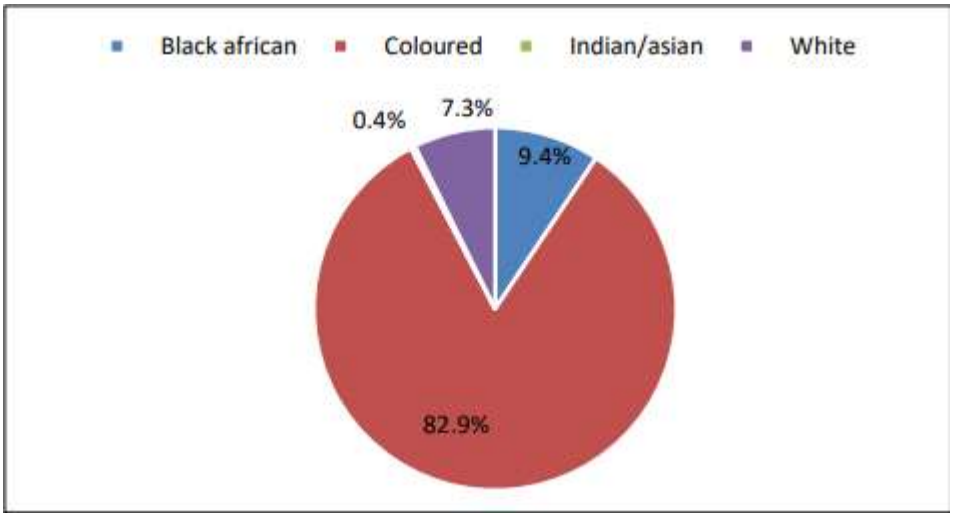


Figure 21. outlines the percentage distribution of the population of Richtersveld in 2016, where the Coloured population group accounts for 82.9% of the population in the municipality, followed by the Black African, White and Indian/Asian population groups.

Population by 5 year age groups and sex, 1996-2016

	1996			2001			2011			2 016		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
00 - 04	642	598	1 240	509	451	960	481	456	937	445	438	883
05 - 09	654	602	1 256	509	443	951	482	440	922	409	435	844
10 - 14	633	562	1 195	468	456	924	525	472	997	414	407	821
15 - 19	446	466	912	487	411	898	487	394	881	626	392	1 018
20 - 24	644	562	1 205	445	425	870	475	434	910	597	476	1 073
25 - 29	826	590	1 416	478	440	919	674	533	1 207	530	475	1 005
30 - 34	724	594	1 318	466	458	924	524	444	968	662	620	1 283
35 - 39	550	486	1 036	446	463	909	506	435	941	455	491	946
40 - 44	511	403	914	311	358	668	526	439	965	606	365	971
45 - 49	335	303	638	308	292	600	447	454	902	555	349	904
50 - 54	278	230	508	214	209	423	365	328	692	363	515	878
55 - 59	207	153	360	173	179	352	286	251	537	376	261	638
60 - 64	115	146	262	114	129	243	191	215	406	152	174	325
65 - 69	102	95	197	88	120	208	140	166	306	272	206	477
70 - 74	59	45	104	67	72	139	84	87	172	135	68	203
75 - 79	37	53	89	31	33	64	54	73	128	-	87	87
80 - 84	15	34	49	15	30	45	30	34	64	34	55	89
85+	10	17	27	11	18	29	23	27	50	-	42	42
Unspecified	49	46	95	-	-	-	-	-	-	-	-	-
Total	6 837	5 985	12 821	5 140	4 987	10 126	6 300	5 682	11 985	6 631	5 856	12 487

Table 7 shows the population for Richtersveld by five-year age groups and sex. It shows a general decrease in the population for the age groups over the period of 1996 to 2016. There is however a significant percentage increase in the proportion of elderly pppulation aged 65 years and above, signifying a greater life span for elderly population in the province.

Distribution of the total population by age group and sex, 2016

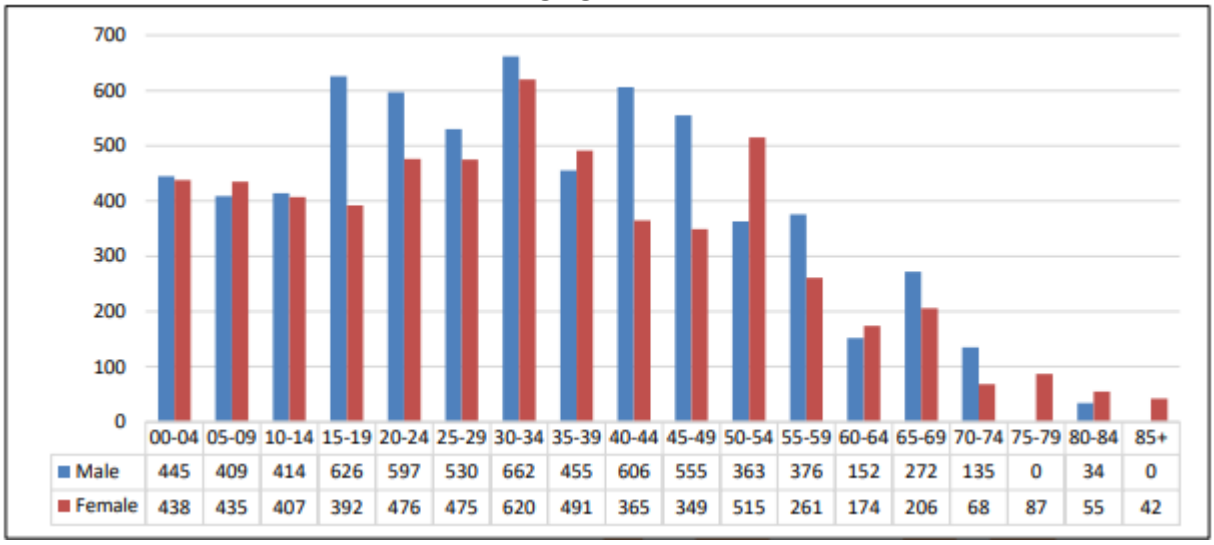


Figure 22. indicates that the greater proportion of the population of Richtersveld is young,
consisting mainly of children and youth. There is however a greater proportion of males compared to females for ages from 10 to 34 years, and the female population shows a greater proportion in numbers compared to males for ages 75 and above. This signifies a greater lifespan for females than males.

Distribution of persons aged 1 year and older by language spoken most often in the household, 2016

Language spoken in household	Number	Percentage (%)
Afrikaans	11 397	**92.5**
IsiXhosa	526	**4.3**
English	257	**2.1**
Setswana	63	**0.5**
Other	53	**0.4**
IsiZulu	19	**0.2**
Total	**12 316**	**100.0**

Table 8 above shows that the language spoken mostly by households in Richtersveld is Afrikaans, representing a total of 11 397 (92.5%) households, followed by those who speak IsiXhosa at 4.3%. The least spoken language in Richtersveld is IsiZulu and Setswana.

Disability type and degree of difficulty in functioning by sex, 2016

Disability type	Degree of difficulty	Male	Female	Total
Seeing	No difficulty	5 028	4 172	9 200
	Some difficulty	1 002	1 039	2 041
	A lot of difficulty	155	194	349
	Cannot do at all	-	-	-
	Do not know	-	13	13
	Total	6 185	5 418	11 603
Hearing	No difficulty	5 902	5 143	11 045
	Some difficulty	179	245	425
	A lot of difficulty	70	30	100
	Cannot do at all	17	-	17
	Do not know	18	-	18
	Total	6 186	5 418	11 605
Communication	No difficulty	6 101	5 371	11 472
	Some difficulty	50	48	98
	A lot of difficulty	-	-	-
	Cannot do at all	17	-	17
	Do not know	18	-	18
	Total	6 186	5 419	11 605
Walking or climbing stairs	No difficulty	5 886	4 965	10 852
	Some difficulty	132	297	429
	A lot of difficulty	85	131	216
	Cannot do at all	64	25	89
	Do not know	18	-	18
	Total	6 185	5 418	11 604
Remembering	No difficulty	5 888	4 978	10 867

	Some difficulty	279	321	600
	A lot of difficulty	-	108	108
	Cannot do at all	-	-	-
	Do not know	18	12	29
	Total	6 185	5 419	11 604
Self-care	No difficulty	6 116	5 274	11 389
	Some difficulty	52	103	155
	A lot of difficulty	-	28	28
	Cannot do at all	-	13	13
	Do not know	18	-	18
	Total	6 186	5 418	11 603

Table 9 shows that 349 persons in Richtersveld are having a lot of difficulty seeing. This is followed by those with difficulties with walking or climbing stairs (216 persons) and those having a lot of difficulty with memory (remembering) with 108 persons. Females are generally more susceptible to having disabilities than males in the municipality.

Highest level of education for persons aged 20 years and above, 1996-2016

	No schooling	Some Primary	Complete Primary	Some Secondary	Grade 12/Std 10	Higher	Total*
Number							
1996	1 333	3 153	1 598	3 686	1 020	473	11 262
2001	668	2 875	1 371	2 827	1 151	272	9 165
2011	273	2 846	1 288	4 055	1 544	566	10 572
2016	45	1 181	941	3 837	2 113	576	8 692
Percent (%)							
1996	11.8	28.0	14.2	32.7	9.1	4.2	100.0
2001	7.3	31.4	15.0	30.8	12.6	3.0	100.0
2011	2.6	26.9	12.2	38.4	14.6	5.4	100.0
2016	0.5	13.6	10.8	44.1	24.3	6.6	100.0

Table 10 shows an improvement in the level of education in Richtersveld over the period 1996 to 2016, where there was a decline in the number and proportion of persons aged 20 years and above with no schooling (from 11.8% to 0.5%). It shows a significant increase in the proportion of persons with higher education, from 4.2% in 1996 to 6.6% in 2016. There is also an increase in the proportion of persons who have grade 12/standard 10.

LEVELS OF SERVICE TO COMMUNITIES

Access to Services

One of the major challenges of the Richtersveld municipal region is the vast geographic layout. When access to services are assessed within the IDP, it includes the vast amount of households that are in the rural areas. These households do pose a major challenge in terms of service delivery as they have to be connected to basic municipal service over vast distances.

The access to basic services is crippled by the low culture of payment due to the historical past and the fact that due to the integration or demarcation a flat rate was installed. This has caused more problems in relations to the payment of services but also the willingness to grasp responsibility for payment of services.

Water

Water Management

In the previous financial year the municipality has spent more than R21m on the improved of water services in Sanddrift, Kuboes, Lekkersing, Eksteenfontein and Port Nolloth through the drought relief and Water Services Improvement Grant (WSIG). Richtersveld Municipality is an accredited Water Services Authority in terms of the National Water Act (Act 36 of 1998) and provides potable water to Lekkersing, Eksteenfontein and Port Nolloth. Transhex Operations Ltd provides fresh water for Sanddrift and Kuboes.

Although water is supplied by these mining houses no formal Service Level Agreements are intact. All towns do not have sufficient water sources except Alexanderbay, Kuboes and Sanddrift. In Port Nolloth where the water source is under ever increasing pressure due to numerous residential developments and holidaymakers, there is a bidding process underway to build a 1,5mega litre desalination plant in conjunction with DWA & Sanitation. The bidding process includes the advancement of the portion counter funding that is required from the department. In relation to the improvement of water services to Port Nolloth we remain steadfast in our endeavours to secure water services. To this end, the municipality ought to urgently looking at alternatives to the desalination idea which took centre stage since 2008 without any success. The upgrading of the 8Mile pipeline will aid to ensure an improved service to communities of Sizamile, Port Nolloth town, Nollothville as well as McDougalls bay.

Richtersveld Municipality is working closely with DWA & Sanitation to improve the Blue & Green Drop Status. To qualify for a Blue Drop Status, the water quality management system has to be between 96% and 100%. All efforts will be put in place to ensure that there is improvement on the status and to restore the quality of water.

High water losses still remain a challenge and council need to explore ways in which to improve this situation as it also leads to revenue losses. During the public participation of the IDP process it became evident that the communities in Eksteenfontein, Kuboes and Lekkersing insisted that the municipality prioritised the supply of water to their respective towns. To this end funding was secured under the WSIG program of the DWA

& Sanitation to improve services and the supply for household consumption and to mitigate on the service during summertime.

Richtersveld Municipality has approved a Water Services Development Plan (WSDP) in 2010 which is one of the sector plans of this IDP. This WSDP needs to be reviewed to bring in line the proposed development plans. The WSDP describes the future plans to secure water sources and entails the development of more boreholes, recycling of waste water effluent, desalination of possibly groundwater and seawater as the last and most expensive option. Proper planning and the achievement of the goals and targets determined in the WSDP will allow Council to meet their strategic objectives of providing quality basic services. Sufficient water sources and proper infrastructure for water provision is a fundamental requirement for economic growth and development facilitation.

Diamond mining can be regarded is one of the largest industrial water users in the Richtersveld municipal area but the main water users still remain households for domestic purposes, schools and agricultural activities for irrigation purposes. Domestic household usage normally peaks in the summer holidays in all towns. In Port Nolloth which is flooded with holiday makers and visitors to our beaches becoming an increasing challenge for the municipality. All water infrastructure needs to accommodate this peak period. It has now become a norm over the last couple of years to institute and strictly enforce water restrictions especially in this coastal town. The water losses in Port Nolloth is more than 17% which is outside of the acceptable norms but can be attributed towards dilapidated infrastructure, asbestos piping and the dune sands which make it difficult to detect leakages easily.

There is a deliberate attempt to provide prepaid water meters as it will assist in the demand management but also change the payment culture and to ensure that the municipality can be able to maintain and provide the service. To this end, it need a thorough process of engaging with communities and to educate and run awareness campaigns for buy-in and acceptance.

DELIVERY OF WATER SERVICES

The Water Services Act (Act 108 of 1997) requires every municipality to draft a comprehensive Water Services Development Plan (WSDP). The WSDP is also regarded as one of the sector plans of the IDP because most of the planning for development being social, economic or environmental will depend on access to water services.
Richtersveld Municipality has to ensure that all its customers receive efficient, affordable, economical and sustainable access to water services. The recent drought relief provided by DWS has ensure a meaningful impact on the delivery of water services. The drought relief has largely contributed towards a sustainable supply of water for households and more than 8 boreholes were drilled and equipped.

The municipality has developed and submitted a plan to improve water services in all towns especially Kuboes and Port Nolloth as priority areas under the drought relief.

PROJECT NAME	ACTIVITY	COSTING
15 Mile	Sink and equip 6 x boreholes	R15m
Kuboes water services	Improve and secure extraction point on river banks	R16.9m
AC Pipe replacement	Improvement of services on Alexanderbay pipeline	R4.5m

The WSDP of Richtersveld Municipality highlights specific issues with regards to water management and strategies to ensure the sustainability of adequate water to the end users in the municipal area. It also sets targets for interventions with a specific focus on the following aspects:

- Basic water and sanitation services to each and every household in Richtersveld
- Sustainable water supply to ensure the health & wellness of communities
- Access to bulk water supply to attract industrial and other types of economic development to the area
- Ensure quality and clear drinking water to all consumers
- Establishment of infrastructure to ensure adequate storage capacity
- Rehabilitation of ageing infrastructure in order to ensure the long term sustainability of water services
- Continuous monitoring and control of water losses
- Adequate water pressure for all consumers

BLUE DROP STATUS

In order for Richtersveld Municipality to obtain Blue Drop certification or improve on the previous performance, the following must be done:

- Fully implement the water safety plans which will certainly have significant financial implications to the municipality.
- Train and retrain process controllers for all water treatment systems in Richtersveld Municipality
- Continuously maintain and replace outdated water infrastructure
- Set up systems to log and capture water related information on the internet based

Blue Drop System

The current municipal Blue Drop Score is at 36, 77% and shown little improvement in the approach to drinking water quality management.

ELECTRICITY

The major challenge for the municipality is the dilapidated infrastructure and the street lightning in all of the outside towns which are serviced by Eskom. The current electricity losses at Port Nolloth is more than 28%.

Electricity distribution in Richtersveld municipal area is done by Richtersveld Municipality and Eskom respectively and the under mentioned table indicates which entity is responsible for electricity distribution.

RICHTERSVELD MUNICIPALITY	ESKOM
Port Nolloth town area	Alexanderbay
Nollothville	Eksteenfontein
McDougalls bay	Kuboes
	Lekkersing
	Sizamile
	Sanddrift

The table above depicts the unbalanced manner of electricity supply which defeat the objective of improved basic services and debt collection methods. All the formal residential areas in Richtersveld Municipality have access to electricity but street lighting is a major concern. The municipality does not generate any electricity and buys all its electricity from Eskom. There is a need to look at alternative method of supply due to the high costs of electricity. The municipality has embarked on an investigation in terms of electricity supply and might be able to detect any irregularities. Cable and electricity theft is a big concern and has led to the stoppage of services.

Currently the municipality do not have a problem in terms of its capacity to deliver bulk electricity services for any current and future residential or commercial developments in the area. An application to increase in NMD from 2000 KVA to 3500 has being submitted to ESKOM for approval. The selling of electricity to end users makes up a significant portion of the income budget of the municipality but does not secure the financial viability of the institution. Even though Richtersveld Municipality do not have a long term strategy to explore alternative energy sources, it does however promote and support private initiatives to explore the generation of energy through solar and wind farms by private entities.

Richtersveld Municipality provides all indigent households that are linked to the network with 50 kilowatt hours of free electricity. Free Basic Electricity to the residents was implemented on 01 October 2009 according to the Free Basic Electricity Notice, 1693 of 2003 and still continued today. The provision of Free Basic Electricity certainly impacted positively on the impoverished communities due to the financial relieve on their service payments. It also enhanced their constitutional right to energy in terms of the Constitution of South Africa of 1996.

The municipality has improved streetlights in all towns although not at a satisfactorily level to all but will continue to do so. This is part of the programme of safer communities and to improve service delivery.

Indigent household services provided by municipality

Number of households benefiting from indigent support system, 2016

Namakwa District Municipality	Indigent households registered with municipalities	Benefitting			
		Water	Electricity	Sewerage and sanitation	Solid waste management
Hantam Municipality	1 452	1 452	1 229	1 452	1 452
Kamiesberg Municipality	1 276	1 276	1 201	205	1 226
Karoo Hoogland	944	944	944	944	944
Nama-Khoi Municipality	5 045	5 045	5 045	5 045	5 045
Richtersveld Municipality	1 068	1 068	1 033	1 068	1 068
Khâi-Ma Municipality	1 752	1 752	1 353	1 751	1 751
Total	**11 537**	**11 537**	**10 805**	**10 465**	**11 486**

Source: Non-financial census of municipalities, 2017

Table 11 shows that the number of indigent households registered in the Namakwa district for the year 2016 is 11 537 units with Nama-Khoi municipality having the highest number of such households at 5 045 units, followed by Khai-Ma, Hantam, and Kamiesberg municipality with 1 752, 1 452 and 1 276 indigent households registered as indigent respectively. The municipalities with the least number of indigent households are Karoo Hoogland and Richtersveld with each having 944 and 1 068 indigent households respectively.

It is to be noted that not all indigent households across the respective municipalities are benefiting from free basic services from the municipality however, with the exception of households in Karoo Hoogland and Nama-Khoi municipality, where all indigent households are receiving free basic services from the municipality.

SEWERAGE & SANITATION

Alexanderbay has a full waterborne sewerage system in place while Port Nolloth and the rest of the towns are partially serviced with a septic tank system. The existing tanker service is under huge pressure especially in Port Nolloth during peak holiday seasons. The upgrading of the oxidation ponds in Port Nolloth was prioritised in the 2017/2018 FY.

In Kuboes, Eksteenfontein and Lekkersing there are UDF and VIP toilet systems in place. Within the next five years the aim is to eradicate or minimise the UDF and VIP toilet system in our communities. This will not only provide a dignity but ensure that historical backlogs are confronted with clear interventions to make a difference in people's lives.

Council has resolved that oxidation ponds be developed in towns but with the main focus on Port Nolloth. Future sewerage plants will be done as funds become available. Sewer tanks are not seen as a sewerage backlog.

A number of new business and residential developments have started particularly in Port Nolloth which means that the sewerage purification works in Port Nolloth needs to be upgraded as a matter of urgency to accommodate these new developments.

Adding to this is the need for the integration of areas such as Diamond City, Rainbow City, Single City, Ovenbay Sun, Hicksons Barracks, Ovenbay Barracks and Silver City to the sewer system. The Richtersveld Municipal Council realises that if it wants to achieve the strategic objectives of establishing proper infrastructure for basic service delivery it must put a high priority on the upgrading of waste water treatment plants over the next 5 years. There is an urgent need for Council to review planning to integrate the sewer services in the aforementioned areas as the honey sucker can no longer keep up with the level of service standard. A new sewer tanker was manufactured and has largely contributed towards our objective of improved services. The municipality will look at a new method of prepaid services once all the backlogs and current fleet has been upgraded to render a proper service.

This will certainly unlock business development potential, attract investment to the area as well as facilitate the implementation of much needed residential developments.

Type of sanitation facilities used by household, 1996-2016

Table 12 below shows an increase in the proportion of households that use a flush or chemical toilet in Richtersveld, from 70.2% in 1996 to 85.3% in 2016. There is a slight increase in the proportion of households using a pit latrine, from 10.9% in 1996 to 12.6% in 2016. It shows a significant decrease in the proportion of households using bucket latrine in 1996 to 2016.

	Flush or chemical	Pit latrine	Bucket latrine	None of the above	Total
1996	70.2	10.9	4.5	13.8	**100.0**
2001	79.1	13.5	3.2	4.1	**100.0**
2011	78.8	12.5	0.9	7.5	**100.0**
2016	85.3	12.6	0.3	1.4	**100.0**
2018	89.2	10.4	0.2	1.2	**100.0**

WASTE MANAGEMENT

Refuse Disposal

The SA Constitution states that the people of South Africa have the right to an environment that is not detrimental to human health and Local Government is assigned the responsibility for refuse removal, refuse dumps and solid waste disposal.

Therefore, all the towns in the municipal area have a solid waste programme in place and all households are serviced once a week and all businesses at least two times a week. Recycling at source is encouraged throughout the area.

The Waste Management goal is to optimize the waste management strategy to ensure continuous cost effective services by also encouraging waste minimization and recycling activities to enhance in proper management services. The Richtersveld Integrated Waste Management plan was completed and approved by Council in 2015.

This is one of the core basic services rendered by Richtersveld Municipality and involves the collection of refuse from households and businesses within the jurisdiction of the municipality.

All of the households have their refuse removed at least once a week and businesses twice a week. During the recent public participation process communities highlighted the implementation of a wheelie bin refuse removal system to replace the current black bag system. Richtersveld Municipality is doing an analysis of the cost implication of this wheelie bin system and will certainly consider it once the financial implications have been established.

Currently there are six (6) licensed landfill sites in all the towns of the municipality where all the refuse of the towns are being dumped. The Richtersveld Integrated Waste Management Plan set strategic objectives for the next five years in this regard. The Plan was compiled in 2013 in conjunction with Department of Environmental Affairs & Nature Conservation, Namakwa District and adopted by Council in 2014. There are still a number of challenges in terms of waste management, which includes:

- Illegal dumping of domestic refuse, despite the fact that the municipality have placed
- numerous public signage and notices in most residential areas Illegal entrance by scavengers at the landfill site
- Shortage of staff and resources in the Solid Waste Department

There is an Integrated Waste Management Plan in place.

Type of refuse removal used by household, 1996-2016

	Removed by local authority at least once a week	Removed by local authority less often	Communal refuse dump	Own refuse dump	No rubbish disposal	Other	Total
1996	68.8	8.0	0.7	10.6	10.2	1.7	**100.0**
2001	74.6	4.7	0.0	12.2	8.5	0.0	**100.0**
2011	82.9	7.7	0.6	6.0	1.2	1.6	**100.0**
2016	87.2	8.0	3.2	0.4	0.3	0.8	**100.0**
2018	90.1	6.0	2.8	0.3	0.3	0.5	**100.0**

Table 13 shows an increase in the proportion of households in Richtersveld municipality whose refuse is removed by the local authority at least once a week, from 68.8% in 1996 to 87.2% in 2016. It shows a decrease in the proportion of households that have no rubbish disposal.

ROADS

The connection roads within Richtersveld consist of 150km of dirt roads which makes travelling between towns from the R382 very difficult as the maintenance of these roads are very low. The Richtersveld Municipality is the first municipality in the Namakwa District who has compiled and adopted an Integrated Transport Plan (ITP).

The fact that Richtersveld Municipality is situated along R382 as a regional road in the Northern Cape the entire towns except Alexanderbay and Port Nolloth poses particular economic and logistical challenges to the area. The maintenance of the said road is very problematic as it passes through the town of Port Nolloth and cannot done by the Richtersveld Municipality on its own. There is a need for assistance by the Provincial department of Public Works and Roads to ensure that the road is maintained. There is a need to re-route all heavy trucks through Port Nolloth as these trucks cause huge damages to the existing R382.

The 80km dirt road between Alexanderbay and Kuboes was resurfaced with the assistance from Public Works, Alexkor RMC JV and Trans Hex Operations Ltd. There is an indication to resurface the dirt road between Alexanderbay and Kuboes again.

HEALTH SERVICES

Health Services in the municipal area are currently done by the Department of Health in the district. In assessing the level of health services in the Richtersveld there is an urgent need to improve the service due to the vast distances and conditions of dirt roads.

The new notion therefore as being putting forward was to ensure that health services be rendered in a block format, eg. Alexanderbay, Sanddrift and Kuboes as one block with the revitalization of the clinic at Alexanderbay to serve the block.

The other block to consist of Lekkersing, Eksteenfontein and Port Nolloth with the construction of the Community Health Centre (CHC) in Port Nolloth. The construction of the CHC has come to a grind halt but construction works will be starting soon again. The Emergency Medical Services (EMS) in the municipal jurisdiction also need to be whined up.

The following health facilities are found in the municipal area:

- Port Nolloth Hospital with available doctors
- Provincial clinics in Alexanderbay, Kuboes, Lekkersing, Sanddrift, Eksteenfontein
- Mine clinic in Baken is still operating at a very low scale.
- Private doctors and district surgeons

Health Facilities are fairly distributed throughout the municipal area

EDUCATION

Education levels have a major bearing on the quality of life. The inability of an individual to perform certain basic functions due to illiteracy is also part of elements that define human poverty. Low educational levels are likely to push individuals to unemployment

and to low paying jobs. Low educational levels also limit the ability of an individual to learn new skills, to be trained and developed.

There is an urgent need to align subjects at high school with the main stream career choices to ensure that people are employable, to attract and retain skills that are required and scarce within the Richtersveld, eg. Accounting, etc.

The primary school at Lekkersing is very dilapidated and has structural damages and estimated repair costs is in the tune of R3,7m.

There is need to engage with the Department of Education, School Governing Body, URCSA,parents and school community to look at the current situation and path a way forward. A request to meet with these role players was submitted to the Namakwa District Municipality for assistance.

Strategic Objectives

The Richtersveld Council considered the current levels of development within the Richtersveld municipal region and developed five (5) Strategic Objectives that identifies the areas of impact for their term of office. When developing strategic objectives, the municipal Integrated Development Plan should be developed within the legislative and strategic framework provided by national and provincial government.

(16) *SENSITIVE LANDSCAPES:*

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

1. Limited development areas (Section 23 of the Environmental Conservation Act, 1989 (Act 73 of 1989).
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.
5. National monuments and gardens of rememberance.
6. Archaeological and palaeontolocial sites.
7. Graves and burial sites.
8. Lake areas, offshore islands and the admirality reserve.
9. Estuaries, lagoons, wetlands and lakes.
10. Streams and river channels and their banks.
11. Dunes and beaches.
12. Caves and sites of geological significance.
13. Battle and burial sites.
14. Habitat and/or breeding sites of Red Data Book species.
15. Areas or sites of outstanding natural beauty.
16. Areas or sites of special scientific interest.
17. Areas or sites of special social, cultural or historical interest.

18. Declared national heritage sites.
19. Mountain catchment areas.
20. Areas with eco-tourism potential.

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

(b) Description of the Current Land Use

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

Limited sheep farming is the only feasible form of agriculture here.

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

(2) Evidence of Disturbance:-

On the application area there are existing roads.

(7) Existing Structures:-

The Kannikwa Prospect lies fairly close to the West Coast of South Africa and the coastal town of Port Nolloth. At its closest point, Kannikwavlakte 157 is 6 km from the coast and Kannikwa 156 is 9 km from the coast and 8 km from the town of Port Nolloth.

The Port Nolloth to Steinkopf tar road (the R382) bisects the border between Kannikwa 156 and Kannikwavlakte 157, in other words, it runs straight through the middle of the Kannikwa Prospect as a whole. Furthermore, the Port Nolloth to Kleinzee dirt road runs through Kannikwavlakte 157 and the Port Nolloth to Lekkersing dirt road runs through Kannikwa 156. These roads together provide excellent access to all parts of the Kannikwa Prospect.

The turn-off from the R382 to the part of Kannikwa 156 where current exploration was taking place is 13 km outside of Port Nolloth. The drilling site is reached after a further ~6-7 km drive on generally negotiable farm roads. Toward the dune field, the sandy soil requires use of 4 x 4 vehicles. A landing strip for light aircraft

up to twin-prop four-seater size such as the Beechcraft Baron is available on Kannikwa 156.

No remaining brick or stone buildings occur on the Kannikwa Prospect. A few widely spaced wind pumps supply limited amounts of water, which is mainly used for cattle drinking. Although high voltage power lines run across both Kannikwa 156 and Kannikwavlakte 157, no end-user electricity outlet is available on either farm.

The nearby coastal town of Port Nolloth offers plenty accommodation in the form of a hotel and numerous guest houses. Port Nolloth has a SPAR supermarket and FNB bank. It has several restaurants, clothing shops, hardware shops and general dealers. Port Nolloth also has several vehicle workshops, a fuel station, some engineering workshops specializing in gravel processing equipment, and various speciality shops such as a stationery shop, furniture shop and butcher.

Furthermore, Port Nolloth has a medium-sized harbour, which can accommodate vessels up to 300 tonne size. It has several schools and churches. It has a large, well-equipped police station, a magistrate's court, post office, municipality, library, two museums and a weather station. It has a medium-sized hospital, a clinic and a pharmacist. Port Nolloth has excellent mobile phone reception, and reception on the higher parts of Kannikwa 156 is good.

For specialized engineering works and supplies, a large hospital and any other such specialized services, the town of Springbok is 140km by tar road from Port Nolloth.

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

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

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

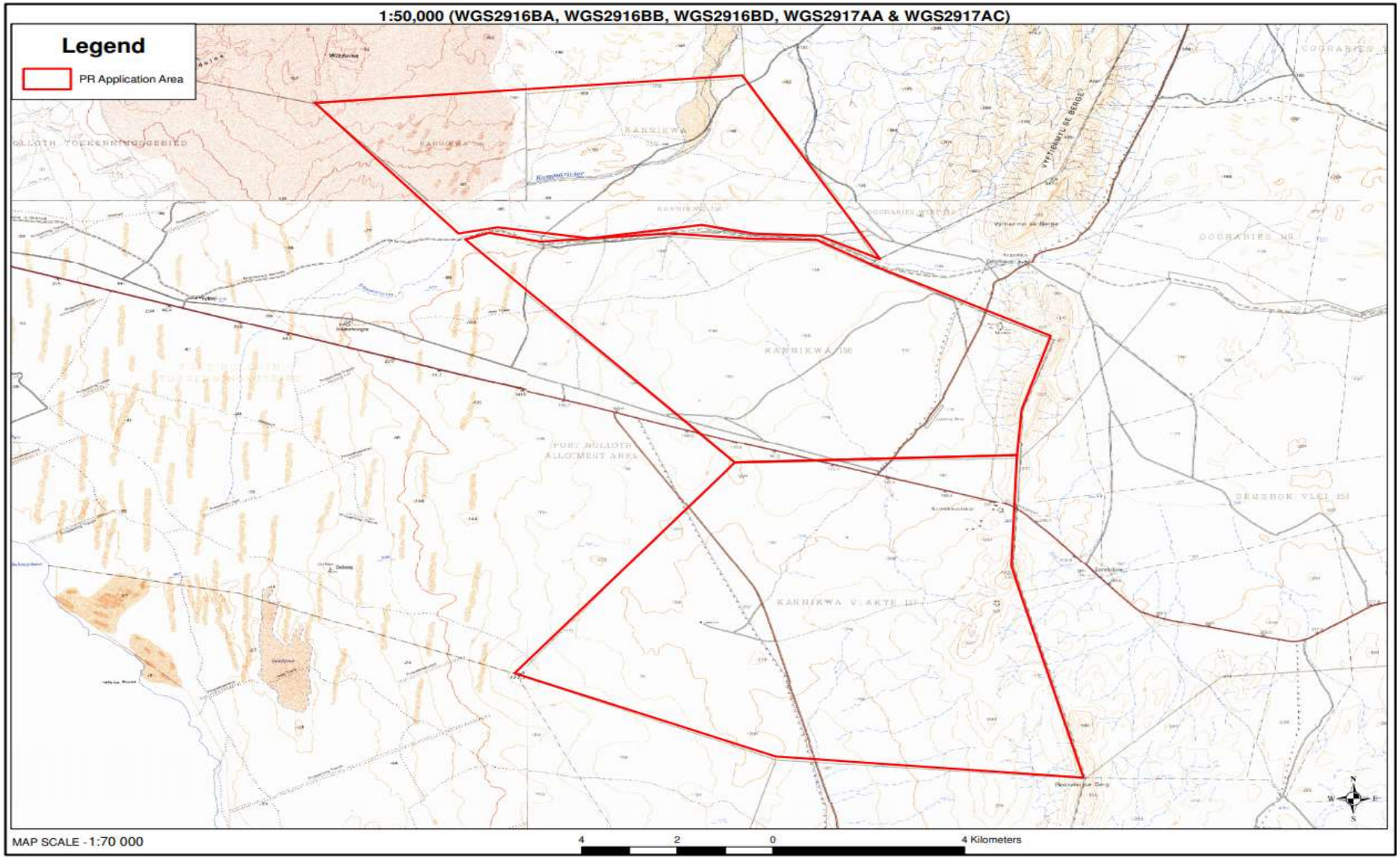


Figure 23. ***Environmental and current land use map*** **on 1:50 000 topgraphical map**

v) Impacts identified

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

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

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

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

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

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

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

Nature of impact

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

Extent

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

- **Local**
  The impacted area extends only as far as the activity, e.g. a footprint.
- **Site**
  The impact could affect the whole, or a measurable portion of the property.

- **Regional**
  The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.

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

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

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

- **Low**
  This alters the affected environment in such a way that the natural processes or functions are not affected.
- **Medium**
  The affected environment is altered, but function and process continue, albeit in a modified way.
- **High**
  Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

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

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

- **Improbable**
  The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- **Probable**

There is a possibility that the impact will occur to the extent that provisions must be made therefore.

- **Highly probable**
  It is most likely that the impacts will occur at some or other stage of the development.
- **Definite**
  The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact.

Determination of significance

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

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

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

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

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and prospecting will unearth the natural topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of temporary prospecting infrastructure, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The

declared areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

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

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

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

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present can be destroyed during the bulk sampling operation.

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

areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

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

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

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

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

Economic slump of the local towns after mine closure is an associated potential impact, although small due to the small scale of the operation. Income streams

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

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

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

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

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

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

Geology and Mineral Resource

Level of risk: Very low

Mitigation measures

- Ensure that optimal use is made of the available prospecting oppertunity to gain access to a mineral resource through proper planning .
- The prospecting area should be delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.

- No dumping of materials prior to approval by the mine manager.

Topography

Level of risk: Low

Mitigation measures

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

Soil Erosion

Level of risk: Low

Mitigation measures

- At no point may plant cover be removed within no-development zones.
- All attempts must be made to avoid exposure of dispersive soils.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- The prospecting operation must co-ordinate different prospecting activities in order to optimise the utilisation of the invasive prospecting and thereby prevent repeated and unnecessary activities.
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers.
- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Excavated and stockpiled soil material are to be stored and bermed on the higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Stockpiles susceptible to wind erosion are to be covered during windy periods.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.

- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- Rehabilitation of the erosion channels and gullies.
- Dust suppression must take place, without compromising the water balance of the area.
- Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.

Soil Pollution

Level of risk: Low

Mitigation measures

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

Land Capability and Land Use

Level of risk: Low

Mitigation measures

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

Groundwater

Level of risk: Medium

Mitigation measures

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

Surface Water

Level of risk: Low

Mitigation measures

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

Indigenous Flora

Level of risk: Low to medium

Mitigation measures

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

All Invasive Plants

Level of risk: Low

Mitigation measures

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

Fauna

Level of risk: Low

Mitigation measures

- Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint.
- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.

- The extent of the prospecting areas (bulk sampling sites) should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the prospecting site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- The ECO must ensure that all contractors and workers undergo Environmental induction prior to commencing with work on site.
- The environmental induction should occur in the appropriate languages for the workers who may require translation.
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to the speed limit.

Habitat

Level of risk: Low

Mitigation measures

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

Air Quality

Level of risk: Very low

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for bulk sampling only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic,

speed control and avoidance of track-on of material onto paved and treated roads.

- ❖ The length of time where prospecting areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed where possible.
- ❖ Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time.
- ❖ For all prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and Vibration

Level of risk: Very low

Mitigation measures

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

Visual Impacts

Level of risk: Very low

Mitigation measures

- ❖ Infrastructure should be placed to optimise the natural screening capacity of the vegetation.
- ❖ Where practical, protect existing vegetation clumps during in order to facilitate screening during the prospecting operations.

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

Traffic and Road Safety

Level of risk: Very low

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage Resources

Level of risk: Low

Mitigation measures

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

Socio-Economic

Level of risk: Low

Mitigation measures

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

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

Interested and Affected Parties

Level of risk: Low

Mitigation measures

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

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

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

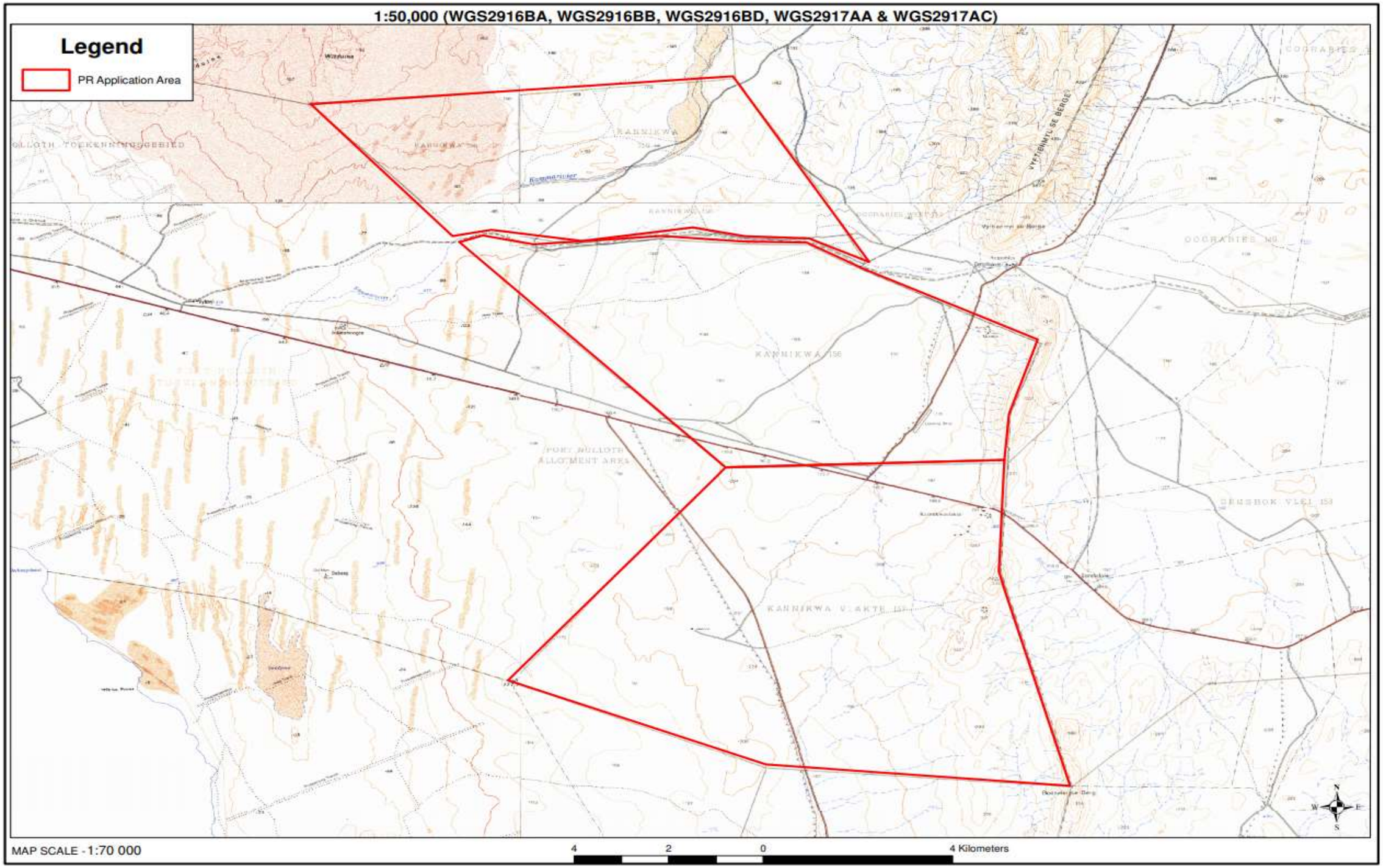


Figure 24. ***Final site layout plan***

x) Motivation where no alternative sites were considered

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

xi) Statement motivating the preferred site.

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

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

i) Plan of study for the Environmental Impact Assessment Process

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

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

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

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

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

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

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

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

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

2. The stripping and stockpiling of topsoil.

3. Load and Haul Operation for the prospecting operation (bulk sampling).

4. Altering the characteristics of surface water features.

5. The development of temporary stockpiles:
   - Topsoil storage area;
   - Mine Residue Stockpile for slime.

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

7. The construction of Processing plant.

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

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

10. Supporting infrastructure:
    - Temporary Offices;
    - Office Parking Bay;

- Temporary Workshop and Wash bay;
- Salvage yard (Storage and laydown area);
- Ablution facilities/ Sewage facilities;
- Generators;
- Pipelines transporting water;

(ii) Description of aspects to be assessed by specialists:

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

(iii) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives:

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

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

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

(iv) The proposed method of assessing duration significance:

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

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

- **Short term**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.

- **Medium term**
  The impact will last up to the end of the prospecting period, where after it will be entirely negated.

- **Long term**
  The impact will continue or last for the entire operational life of the prospecting, but will be mitigated by direct human action or by natural processes thereafter.

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

(v) The stages at which the Competent Authority will be consulted:

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

(vi) Particulars of the public participation process with regard to the Impact Assessment process that will conducted:

1. **Steps to be taken to notify interested and affected parties:**
   (These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h)(ii) herein.)

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

   An Advert (Notice) will be placed in the GEMsbok and should be published between the week of 12 July and 19 July 2021 to notify all other interested and affected parties.

Registered consultation letters were send on 12 July 2021 to all identified parties and government departments with the Scoping Report on disc included.

The document will also be made available at the public library in Port Nolloth if possible.

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

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

The following procedures will be followed:

- The Scoping Report will been distrubited to all registered parites via registered mail in July 2021.
- All other documentation (Scoping, EMP and EMPR) will be made available in public libraries.
- Records will be kept of the complaints and the mitigation measures implemented.

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

The following information will be provided to IAPs:

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

The following information will be requested from the IAPs:

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

(vii) Description of the tasks that will be undertaken during the environmental impact assessment process:

Determining environmental attributes

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

Identification of impacts and risks

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

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

Consideration of alternatives

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

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

Process to assess and rank impacts

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

Table 14. Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability

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

Table 15. Explanation of EXTENT of impact

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

Table 16. Explanation of DURATION of impact

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

Table 17. Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would

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

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

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

(Severity + Extent + Duration) x Probability weighting

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

Table 18

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

Significance of impacts is defined as follows:

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

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

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

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

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

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

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

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

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

	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Continuous rehabilitation • Stormwater run-off control • Immediately clean hydrocarbon spill • Drip trays • Erosion control	
Generators	• Groundwater contamination • Surface water contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Access control • Maintenance of generator and bund walls • Noise control and monitoring • Oil traps • Groundwater quality monitoring • Immediately clean hydrocarbon spill	Low
Office – Pre-fabricated office blocks on concrete	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Low
Parking bay	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Processing plant	• Dust • Noise • Groundwater contamination • Surface Water contamination	• Access control • Maintenance of processing plant • Dust control and monitoring • Groundwater quality and level monitoring	Medium

	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Water distribution Pipeline	• Surface disturbance • Possible Groundwater contamination • Soil contamination • Surface water contamination	• Maintenance of pipes.	Low
Roads	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Maintenance of roads • Dust control and monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Salvage yard	• Possible Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Access control • Maintenance of fence. • Stormwater run-off control • Immediately clean hydrocarbon spill	Low
Stockpile area	• Dust	• Dust control and monitoring • Noise control and monitoring	Low

	• Possible Groundwater contamination • Surfacewater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Topsoil storage area	• Dust • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil disturbance • Surface disturbance	• Dust control and monitoring • Stormwater run-off control. • Continuous rehabilitation • Rip disturbed areas to allow re-growth of vegetation cover • Backfilling of topsoil during rehabilitation	Low
Waste disposal site	• Groundwater contamination • Surface water contamination	• Storage of waste within receptacles • Storage of hazardous waste on concrete floor with bund wall • Removal of waste on regular intervals.	Low
Mine Residue Deposit – Slimes	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Stormwater run-off control. • Rip disturbed areas to allow re-growth of vegetation cover	Low-Medium
Washbay	• Possible Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination	• Concrete floor with oil/water separator • Stormwater run-off control • Immediately clean hydrocarbon spills	Low

Water tank with filter system: It is anticipated that the operation will establish 1 x 10 000 litre water tanks for potable water.	• Ground water and usage • Surface disturbance	• Monitor water quality and quantity • Maintenance of tanks (check for leaks).	Low

(ix) Other information required by the Competent Authority:

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

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

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

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

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

No evidence is known as yet of any such sites and/or objects on the site itself. A heritage and palaeontological desktop study will be done for this application.

Should any heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This is true for graves and cemeteries as well.

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

As mentioned before, the specific occurrence of possible diamond resource in the area dictates the selection of the specific prospecting site and there are no alternatives in terms of project location.
The prospecting operation will provide ± 15 - 25 jobs and will also add to the increased economic activity and the area surrounding the farm.
Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR area adhered to e.g. rehabilitation.

(xi) Undertaking regarding correctness of information:

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

Signature of EAP
Date: 12 July 2021

(xii) Undertaking regarding level of agreement:

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

Signature of EAP
Date: 12 July 2021

- END –

APPENDIX 1

CURRICULUM VITAE

Roelina Henriette Oosthuizen

Cell: 084 208 9088

E-Mail: roosthuizen950@gmail.com

1. PERSONAL INFORMATION

Name: Roelina Henriette Oosthuizen

Surname: Oosthuizen (Maiden: Alberts)

Identity number: 7004180037082

Date of birth: 18 April 1970

Gender: Female

Marital status: Married (28 years) with 3 children

Driving license: Yes, Code EB

Languages: Fluent in Afrikaans and English

Nationality: South African

Criminal offences: None

Health: Excellent, fit

2. SYNOPSIS OF PROFESSIONAL CAREER

Roelina Henriette Oosthuizen has 22 years of experience in the environmental management field. She started her career in the area of Environmental Management and Environmental Impact Assessment (EIA) evaluation in 1997 at the Department of Minerals and Energy. After moving to industry in 2005, Roelien became involved in the practical aspects of environmental management. A major project during her early years outside of government was that of the EIA for a Game Reserve and Lodge development near Barkly-Wes, she did this project together with a consultancy firm from Kimberley AWS water solutions (Mr. Adriaan du Toit). In 2007 the Company she worked for was bought by a Canadian Group of Companies and she became more involved in practical aspects of the operations and worked closely with operations personnel in dealing with ongoing management of environmental impacts at the Mine (e.g. monitoring, auditing, operating procedures). She was also centrally involved in liaison with the authorities and with stakeholders in neighbouring areas.

During her time at the Canadian Group of Companies, Roelien was the environmental manager overseeing operations in the Barkly-West, Prieska and Douglas areas. She was responsible for preparing the environmental compliance documents for each operation which included Performance Assessments (Audit reports) and Financial Quantum submissions as well as new applications for Prospecting Rights and Mining Rights with the relevant Scoping, EIA / EMP documents. Her activities included liaison with stakeholders and also with the relevant Departments. During this time, Roelien became increasingly involved in environmental policy and strategy work, as well as the environmental aspects of corporate governance.

She has assisted a range of clients with Environmental Due Diligence audits and compliance audits. Roelien has also undertaken numerous environmental audits, particularly compliance and due diligence audits for clients in the mining industry. Thus, she is familiar with best practice standards in environmental auditing.

Roelien have also represented the South African Diamond Producers Organisation (SADPO) on the Environmental Policy Committee (EPC) at the Chamber of Mines between 2005 and 2011.

In a nutshell, Roelien has wide ranging experience and is thus well-positioned to assist clients in any matter related to sustainability and environmental management. This is achieved through her own skills base and on drawing on specialists.

3. QUALIFICATIONS

MEM (Master in Environmental Management) University of the Orange Free State (2000)
B – Comm NWU (1991)

4. TRAINING COURSES

Roelien have attended various mining and environmental conferences and seminars to stay abreast with the latest changes in legislation, legal compliance and policy positions in the sector.

October 1997	Mineral Laws Administration & Environmental Management (University of Pretoria)
July 2002	Project Management for Environmental Systems (University of the Orange Free State)
August 2004	Environmental and Sustainability in Mining Minerals and Energy Education and Training Institute (MEETI)
September 2005	Converting Old Order Rights to New Order Rights in Mining International Quality & Productivity Centre Johannesburg)
November 2006	Mine waste disposal and Achievement of Mine Closure
February 2007	Introduction to ArcGis 1
April 2010	Mining Law Update Conference (IIR BV South Africa)
November 2010	Social Labour Plans for Mining Workshop (Melrose Training)
August 2011	Mineral Resources Compliance and Reporting (ITC)
May 2012	Enviro Mining Conference 2012 (Sustainability and Rehabilitation) (Spectacular Training Conferences)
August 2012	Mineral Resources Compliance and Reporting 4th Annual (ITC)
March 2013	1st EnviroMining-Ensuring Environmental Compliance and reporting
March 2014	4th Annual EnviroMining Conference
March 2015	5th Annual EnviroMining Conference
February 2018	Seminar by the Department of Environmental Affairs on knowledge sharing workshops on the Screening Tool

5. PROFESSIONAL REGISTRATION

Registered Environmental Assessment Practitioner: Number 2019/1467 EAPASA
Registered as a professional at IAIAsa (International Association for Impact Assessment South Africa). IAIAsa is a voluntary organisation and is not a statutory body regulating the profession. Its members are however expected to abide by the organisations code of ethics.

6. PROFESSIONAL EXPERIENCE

Projects are listed below by area of expertise.

Environmental Management Systems (EMS) and Environmental Auditing

Development of EMS and Compilation of INCIDENT REPORT AND INVESTIGATION FORMS for the EMS of the Canadian group of Companies on various sites.

Undertaking of a range of due diligence and performance audits for operations, including those listed below:

Performance Assessment reports for a mining company with various infrastructure and mining operations near Barkly-West and Windsorton.

Performance Assessment reports for a mining company near Douglas.

Preparation of an environmental auditing checklist / protocol for a Community project with restitution ground in assisting the community to determine environmental legal compliance at their operations.

Environmental audit as part of a closure with Dr. Betsie Milne another specialist. This Annual Rehabilitation Plan has been developed to match the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).This project had the objective of ensuring that this company are accounting for environmental liabilities and risks adequately. The plan distinguishes between (a) those environmental rehabilitation liabilities pertaining to drilling, for which the Company was legally responsible and (b) those environmental rehabilitation liabilities pertaining to historic mining activities, for which the Company is not legally responsible, but consider performing as part of their best practice environmental principals. Three costing scenarios were explored in order to evaluate the most feasible rehabilitation plan, i.e. (1) Total cost (worst-case scenario) including risks, (2) legally required cost and (3) features currently available that do not involve any risks.

Sustainability projects: policies, guidelines, strategies and performance reporting

Involved in the compilation of 43-101 technical documents for listed companies which included information on sustainability and performance in rehabilitation and sustainable mining.

Alien species eradication project guideline and strategy near Barkly-Wes in terms of Regulations that have been promulgated in terms of the Conservation of Agricultural Resources Act, No. 43 of 1983 further make it unlawful to allow various species of weeds and invader plants to grow. The target species was Wild tobacco (declared weed), Pink Tamarisk (declared weed) and Mexican poppy, it also involved the community for job creation and training (2008).

Investigations for a Company near Prieska on Development of a biodiversity offsets policy for the applications for forestry tree licences for protected tree species.

Strategic Environmental Studies and Environmental Impact Assessment (EIA)

Undertaking of a Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006 for a Private Individual which involved the proposed extension of a roof over an existing deck with two wood pillars by means of the excavating of 0.5m X 0.5m X 1m X 2 (½m²) OF SOIL WITHIN 100M OF THE HIGH WATER MARK OF THE SEA. A Positive Record of Decision (ROD) Granted (2010).

Undertaking of an ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) near Boshof for a kimberlite Diamond Mining Company (2015)

Undertaking of a strategic environmental review and amendment for a Chinese group of Companies near Postmasburg. The study provided baseline environmental information and a high-level review of the potential impacts of various components of the development (2014 – 2016). Roelien worked as a member (EAP) of a large team consisting of a project Coordinator, attorneys, water specialists, other specialist and an engineer.

Environmental Impact Assessments for various developments including the proposed mining project for the former retrenchees of De Beers in Kimberley. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialist with contributions of specialist reports to compile the EIA EMP report (2017). Roelien worked as a member (EAP) of a team consisting of De Beers (attorneys and environmentalists), the retrenchees, the appointed contractor, EKAPA, and specialist appointed for the studies.

Environmental Impact Assessments for a Salt operation near Upington. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as part of a team with the Company and another consultant that started with the Water Use Licence application. The public participation was done to include the water use activities.

Environmental Impact Assessment for a change in scope of a prospecting right application consisting of the sole and exclusive right to prospect for iron, silver, zinc, copper and sulphur ore. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as a member (EAP) of a team consisting of the directors of the company and specialists appointed for the studies

7. CAREER PATH

01 April 1997 to 28 February 2005
DEPT OF MINERALS & ENERGY
Senior Environmentalist - Assistant Director Environment

MAIN JOB FUNCTIONS

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the

rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate and prioritise the rehabilitation of derelict and ownerless mines.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water Affairs and Forestry, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Conduct inspections and recommendations on mines that apply for closure.
- Evaluate mining licences and prospecting applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on environmental matters, legislation and agreements.
- Influence new development processes through participation in the EMPR and EIA processes and give guidance through education and awareness programmes.
- Calculate and verify financial provision for outstanding rehabilitation.

01 March 2005 – 30 September 2012
Appointed as professional Mineral Law Administration and Environmental Manager for HC van Wyk Diamonds which was bought over in 2007 by a **Canadian group of Companies.**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans:
Formulation of an environmental policy and guidelines for the Group.
Participation in the development of the budget for environmental expenditure.
Co-ordination of technical studies (e.g. monitoring of groundwater quality).
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. Forestry Licences and water sampling for Water Use Licences).
Development of environmental guidelines for contractors on sites.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to Present
Appointed as professional Mineral Law Administration and Environmental Manager for **Mentor Trade and Investments Pty Ltd**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Formulation of an environmental policy and guidelines for the Mine.
Co-ordination of technical studies (e.g. monitoring of groundwater quality) as well as updating of the Mine's IWWMP.
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. as water sampling and effluent).
Development of environmental guidelines for contractors.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to Present part time
Appointed as EAP on some projects for ***Wadala Mining and Consulting Pty Ltd***

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Liaison with regulatory authorities on compliance with environmental legislation.
Environmental awareness and training.

DIE UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT

THE UNIVERSITY OF THE ORANGE FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Magister in Omgewingsbestuur

Master in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ROELINA HENRIËTTE OOSTHUIZEN

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEël VAN DIE UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

VISEKANSELIER/VICE-CHANCELLOR

DEKAAN/DEAN

REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2000-09-16