mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: Richwill Diamonds (Pty) Ltd
Reg No.: 2011/006983/07
Representative: Henry Robins Rich
CELL NO: 082 3783415
E-Mail: **harryrrich2@gmail.com**

POSTAL ADDRESS: PO. Box 139, De Aar 7000
PHYSICAL ADDRESS: Nr 41 Kerkstraat, De Aar, 7000

FILE REFERENCE NUMBER SAMRAD: WC30/5/1/1/2/10430PR

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

Objective of the basic assessment process

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

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

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
    (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    (ii) the degree to which these impacts —
        (aa) can be reversed;
        (bb) may cause irreplaceable loss of resources; and
        (cc) can be managed, avoided or mitigated;

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life

of the activity to—

(i) identify and motivate a preferred site, activity, and technology alternative;
(ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
(iii) identify residual risks that need to be managed and monitored.

DEFINITIONS

Alternatives - In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

i. The property on which or location where it is proposed to undertake the activity;
ii. The type of activity to be undertaken;
iii. The design or layout of the activity;
iv. The technology to be used in the activity, and;
v. The operational aspects of the activity.

Baseline - Information gathered at the beginning of a study which describes the environment prior to development of a project and against which predicted changes (impacts) are measured.

Basic Assessment Process – This is the environmental assessment applied to activities listed in Government Notice No. R 983 (Listing 1) as amended by GNR 327 (dated 7/04/2017) and No. R985 (Listing 3) as amended by GNR 324 (dated 7/04/2017)**.** These are typically smaller scale activities of which the impacts are generally known and can be easily managed. Generally, these activities are considered less likely to have significant environmental impacts and, therefore, do not require a full-blown and detailed Environmental Impact Assessment (see below).

Biodiversity - The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity.

Borehole - Includes a well, excavation, or any other artificially constructed or improved groundwater cavity which can be used for the purpose of intercepting, collecting, or storing water from an aquifer; observing or collecting data and information on water in an aquifer; or recharging an aquifer.

Community - Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities, and other occasional users of the area.

Construction Phase - The stage of project development comprising site preparation as well as all construction activities associated with the development.

Consultation - A process for the exchange of views, concerns, and proposals about a project through meaningful discussions and the open sharing of information.

Critical Biodiversity Area - Areas of the landscape that must be conserved in a natural or near-natural state for the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.

Cumulative Impacts - Direct and indirect impacts that act together with current or future potential impacts of other activities or proposed activities in the area/region that affect the same resources and/or receptors.

Environment - The surroundings within which humans exist and that are made up of

i. The land, water, and atmosphere of the earth;
ii. Micro-organisms, plant, and animal life;
iii. Any Part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Authorisation (EA) – The authorisation by a competent authority of a listed activity.

Environmental Assessment Practitioner (EAP) – The person responsible for planning, management and co-ordination of environmental impact assessment, strategic environmental assessments, environmental management plans or any other appropriate environmental instrument introduced through regulations.

Environmental Impact Assessment (EIA) – In relation to an application to which scoping must be applied, means the process of collecting, organizing, analysing, interpreting, and communicating information that is relevant to the consideration of that application. This process necessitates the compilation of an Environmental Impact Report, which describes the process of examining the environmental effects of a proposed development, the anticipated impacts and proposed mitigatory measures.

Environmental Impact Report (EIR) - A report assessing the potential significant impacts as identified during the Scoping phase.

Environmental Management Programme (EMPr) - A management programme designed specifically to introduce the mitigation measures proposed in the Reports and contained in the Conditions of Approval in the Environmental Authorisation.

Gross Domestic Product (GDP) by region - represents the value of all goods and services produced within a region, over a period of one year, plus taxes minus subsidies.

Hydrocarbons – Oils used in machinery as lubricants, including diesel and petrol used as fuel.
Impact - A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.
Interested and Affected Party (I&AP) – Any individual, group, organization, or associations which are interested in or affected by an activity as well as any organ of state that may have jurisdiction over any aspect of the activity.
Municipality –

(a) Means a metropolitan, district or local municipality established in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998); or
(b) In relation to the implementation of a provision of this Act in an area which falls within both a local municipality and a district municipality, means
    (i) The district municipality, or
    (ii) The local municipality, if the district municipality, by agreement with the local municipality, has assigned the implementation of that provision in that area to the local municipality.

NEMA EIA Regulations - The EIA Regulations means the regulations made under section 24(5) of the National Environmental Management Act (Act 107 of 1998) (Government Notice No. R 982, R 983, R984 and R 985 in the Government Gazette of 4 December 2014 refer as amended by GNR 324, 325, 326 and 327 of 7 April 2017.
No-Go Alternative – The option of not proceeding with the activity, implying a continuation of the current situation / status quo
Public Participation Process (PPP) - A process in which potential Interested and Affected Parties are given an opportunity to comment on, or raise issues relevant to, specific matters.
Registered Interested and Affected Party – All persons who, because of the Public Participation Process conducted in respect of an application, have submitted written comments, or attended meeting with the applicant or environmental assessment practitioner (EAP); all persons who have requested the applicant or the EAP in writing, for their names to be placed on the register and all organs of state which have jurisdiction in respect of the activity to which the application relates.
Scoping process - A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail
Scoping Report – The report describing the issues identified during the scoping process.
Significant impact – Means an impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.
Spatial Development Framework (SDF) - A document required by legislation and essential in providing conservation and development guidelines for an urban area, which is situated in an environmentally sensitive area and for which major expansion is expected in the foreseeable future.
Specialist study - A study into a particular aspect of the environment, undertaken by an expert in that discipline.
Stakeholders - All parties affected by and/or able to influence a project, often those in a position of authority and/or representing others.
Sustainable development - Sustainable development is generally defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. NEMA defines sustainable development as the integration of social, economic, and environmental factors into planning, implementation, and decision-making so as to ensure that development serves present and future generations.
Visibility - The area from which the project components would be visible and depends upon topography, vegetation cover, built structures and distance.
Visual Character - The elements that make up the landscape including geology, vegetation, and land-use of the area.
Visual Quality - The experience of the environment with its natural and cultural attributes.
Visual Receptors - Individuals, groups or communities who are subject to the visual influence of a particular project.

ACRONYMS AND ABBREVIATIONS

amsl	Above mean sea level
BA	Basic Assessment
BAR	Basic Assessment Report
BPEO	Best Practicable Environmental Option
CBA	Critical Biodiversity Area
DM	District Municipality
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
DSR	Draft Scoping Report
EA	Environmental Authorisation

EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ESA	Ecological Support Area
EStA	Early Stone Age
FoT	"Free on Truck ": means there is no processing and that it is a raw product.
FSR	Final Scoping Report
GA	General Authorisation
GDP	Gross Domestic Product
GDPR	Regional Gross Domestic Product
GGP	Gross Geographic Product
GNR	Government Notice Reference
ha	Hectares
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
km	Kilometres
km^2	Square kilometres
LED	Local Economic Development
LM	Local Municipality
LoM	Life of Mine
LN	Listing Notice
L/s	Litres per second
LSA	Late Stone Age
m^3	Metres cubed
MAP	Mean Annual Precipitation
MAPE	Mean Annual Potential Evaporation
MASMS	Mean Annual Soil Moisture Stress (% of days when evaporation demand was more than double the soil moisture supply)
MFD	Mean Frost Days
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MSA	Middle Stone Age
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act 107 of 1998 as amended
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NEM:WA	National Environmental Management: Waste Act 59 of 1998
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act 25 of 1999
NWA	National Water Act 36 of 1998
PES	Present Ecological State
RDL	Red Data List
ROM	Run of Mine
S&EIR	Scoping and Environmental Impact Reporting
SAHRA	South African National Heritage Resources Agency
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SLP	Social and Labour Plan
StatsSA	Statistics South Africa
WMA	Water Management Area
WML	Waste Management License
WUL A	Water Use License Application

Contents

1 Contact Details EAP

1.1 Details of EAP

Name of The Practitioner: N.J. van Zyl
EAPASA Reg. Number 2019/2034
Tel No.: 082 8898696; Fax No.: 086 6562942
e-mail address: vanzyl.eap@gmail.com

1.2 Expertise of the EAP

The qualifications of the EAP

Current qualifications in this field were obtained through formal studies at the Cape Town Technicon, Nelson Mandela Metropolitan University, and the University of the Orange Free State, which is the following:

- National Diploma Nature Conservation (1986)
- National Higher Diploma (B-Tech) Nature Conservation (1992)
- Master's Degree Environmental Management (MOB 750) (2001)

Further qualifications in this field were also obtained through short courses at the University of the Orange Free State, which is the following:

Environmental Impact Assessment (2001)
Wildlife Management through Veld Management (2001)
Resource evaluation and game ranch management (2003)
Arc GIS (2009)

Summary of the EAP's experience.

(In carrying out the Environmental Impact Assessment Procedure)

With the implementation of the Mineral and Petroleum Resources Development Act 28 of 2002 Mr. van Zyl has started assisting small scale miners with all facets of applications for mining permits in terms of section 27 and prospecting rights in terms of section 16 of the MPRDA. Mr van Zyl has an excellent knowledge of the relevant acts applicable to the mining sector including the following:

- Mineral and Petroleum Resources Development Act 28 of 2002 as amended
- Mineral and Petroleum Resources Regulations 2004 as amended
- National Environmental Management Act 107 of 1998 as amended
- NEMA: Environmental Impact Assessment Regulations, 2014 as amended
- NEMA: Financial Provisioning Regulations, 2015 as amended
- NEMA: Waste Act 59 of 2008 as amended
- NEMA: Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits, 2015
- National Water Act 36 of 1998 as amended (with special attention to sec. 21 water uses)

Since 2002 Mr. van Zyl completed more than 500 applications for mining permits and prospecting rights. The mineral regulations and environmental management for most of these projects were managed throughout the life of the project including:

- Public participation process
- EMP's now BAR
- EMPr Now Scoping and EIA
- Final Rehabilitation, Decommissioning and Mine Closure Plans including Risk Assessment Reports and Annual Rehabilitation Plans
- Performance audits including reviews of Annual Closure Plans and Rehabilitation, Decommissioning and Mine Closure Plans together with financial quantum reviews.

Although Mr. van Zyl specializes in small scale mining operations and prospecting operations that requires investigation, assessment, and communication according to the procedure as prescribed in regulations 19 and 20 of the EIA Regulations he also assists several larger mining operations with environmental management.

2 Location of the overall Activity

Table 1: Location of the overall Activity

Farm Name:	**Property 1:** Portion of Remainder of the Farm Karoetjes Kop No.150 **Property 2:** Portion of Portion 1 of the Farm Karoetjes Kop No.150
Application area (Ha)	412Ha
Magisterial district: **District Municipality:** **Local Municipality:**	VanRhynsdorp Western Cape Province West Coast District Municipality Matzikama Local Municipality
Distance and direction from nearest town	55 Km Northwest of Koekenaap and 50 West of Nuwerus
21-digit Surveyor General Code	**Property 1:** C07800000000015000000 **Property 2:** C07800000000015000001

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

The proposed Prospecting Area is located on a 412Ha portion of the Farm Karoetjes Kop No.150 situated in the Matzikama Local Authority of the VanRhynsdorp Registration division in the Western Cape Province.

The Remainder of the Farm Karoetjes Kop No.150 is registered in the name of Emerald Panther Inv 78 (Pty) Ltd by virtue of Title deed T403/2015. LPI Code C07800000000015000000

Portion 1 of the Farm Karoetjes Kop No.150 is registered in the name of the Government Republic of South Africa by virtue of Title deed T23800/1966. LPI Code C07800000000015000001. Including the adjacent Surf Zone up to 31,49 meters below the low water mark as by the Department Minerals and Energy

The prospecting area is located approximately 55 Km Northwest of Koekenaap and 50 West of Nuwerus along the west coast.

Farm	Portion	Size (Ha)		LPI	Deed	Owner
		Property	Application			
Karoetjes Kop 150	Portion of Remainder	5224.5208	250	C07800000000015000000	T403/2015	Emerald Panther Inv 78 (Pty) Ltd
Karoetjes Kop 150	Portion of Portion 1	162.9030	162	C07800000000015000001	T23800/1966	the Government Republic of South Africa

Figure 1: Locality plan with major Towns and Routes

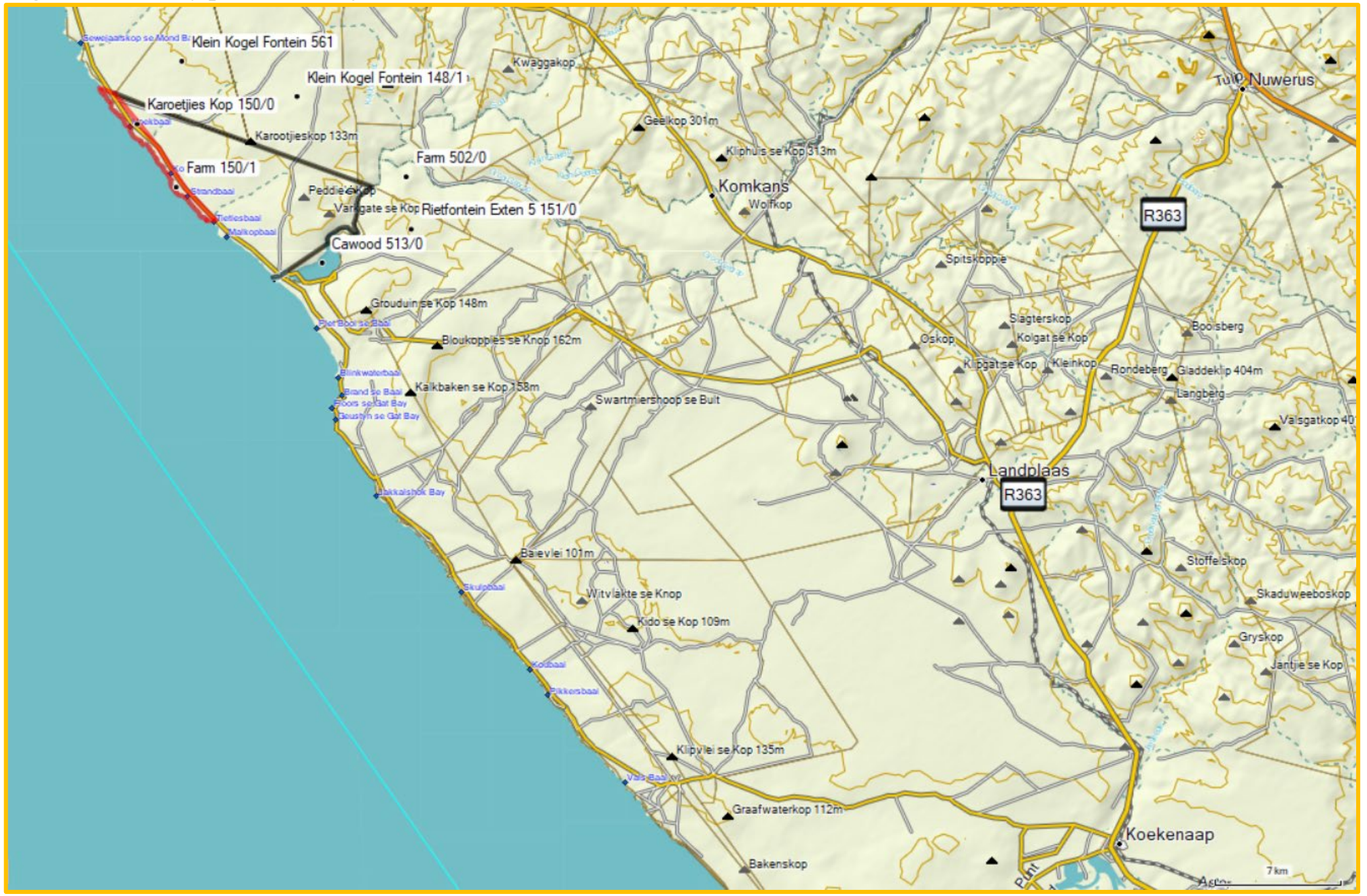

Figure 2: Layout plan

PROSPECTING RIGHT
The figure 1, 2, 3, 4, 5, 870 curve line 1194, 1 represents an area of 412Ha over
Portion of Remainder Karoetjies Kop 150
Portion of Portion 1 Karoetjies Kop 150 including the adjacent Surf Zone up to 31,49 meters below the low water mark

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1103,-31.20051,17.79524	
1104,-31.20062,17.79553	
1105,-31.20061,17.79578	
1106,-31.20068,17.79590	
1107,-31.20078,17.79612	
1108,-31.20123,17.79626	
1109,-31.20150,17.79627	

ID,Lat,	Long
1110,-31.20162,17.79658	
1111,-31.20178,17.79652	
1112,-31.20229,17.79663	
1113,-31.20222,17.79700	
1114,-31.20255,17.79704	
1115,-31.20282,17.79759	
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1117,-31.20248,17.79815	
1118,-31.20256,17.79837	
1119,-31.20261,17.79856	
1120,-31.20274,17.79874	
1121,-31.20277,17.79914	
1122,-31.20285,17.79920	
1123,-31.20299,17.79942	
1124,-31.20325,17.79963	
1125,-31.20336,17.80002	
1126,-31.20335,17.80035	
1127,-31.20327,17.80059	
1128,-31.20375,17.80083	
1129,-31.20406,17.80115	
1130,-31.20456,17.80151	
1131,-31.20459,17.80196	
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1135,-31.20510,17.80230	
1136,-31.20512,17.80229	
1137,-31.20562,17.80264	
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1139,-31.20608,17.80281	
1140,-31.20631,17.80302	
1141,-31.20634,17.80308	
1142,-31.20643,17.80316	
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1144,-31.20665,17.80342	

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1146,-31.20697,17.80388	
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1148,-31.20755,17.80430	
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1155,-31.20869,17.80531	
1156,-31.20885,17.80543	
1157,-31.20905,17.80565	
1158,-31.20932,17.80596	
1159,-31.20947,17.80615	
1160,-31.20969,17.80641	
1161,-31.20986,17.80628	
1162,-31.21009,17.80659	
1163,-31.21005,17.80693	
1164,-31.21018,17.80701	
1165,-31.21034,17.80730	
1166,-31.21053,17.80745	
1167,-31.21064,17.80760	
1168,-31.21083,17.80770	
1169,-31.21120,17.80787	
1170,-31.21170,17.80812	
1171,-31.21186,17.80827	
1172,-31.21208,17.80839	
1173,-31.21230,17.80860	
1174,-31.21266,17.80857	
1175,-31.21279,17.80844	
1176,-31.21301,17.80858	
1177,-31.21306,17.80892	
1178,-31.21313,17.80898	
1179,-31.21326,17.80911	

ID,Lat,	Long
1180,-31.21344,17.80925	
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1182,-31.21342,17.81020	
1183,-31.21343,17.81029	
1184,-31.21352,17.81043	
1185,-31.21367,17.81076	
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1187,-31.21359,17.81131	
1188,-31.21366,17.81138	
1189,-31.21371,17.81135	
1190,-31.21415,17.81137	
1191,-31.21441,17.81157	
1192,-31.21462,17.81155	
1193,-31.21492,17.81174	
1194,-31.21503,17.81198	

3 Description of the scope of the proposed overall activity

The evaluation of a diamond deposit is the process followed to establish economic viability and to identify the "footprint" of the deposit. The "footprint" is a profile of the type of diamonds present, which may be important for market planning. Economic sensitivity analyses indicate that all diamond deposits are most sensitive to diamond value and grade, and these are the dominant factors that influence the decision to proceed with a project.

The main objective is a preliminary evaluation phase to establish the global macro diamond grade and an initial estimate of value per carat to arrive at an Inferred Resource. Desktop studies including sourcing of historical exploration data, and the most important of these is the De Beers exploration conducted over this area will be the first step to redefine the area. As part of this preliminary evaluation phase the redefinition of the area will be ad-dressed as soon as possible, so that pre-bulk sampling work (geophysics and exploration pits) can be done on the selected target areas as depicted in Figure 4 of this document. Information obtained during previous exploration results describes the emerged (as opposed to sub-merged) marine gravel terraces as the Lower Terrace (0-9 mamsl), the Middle Terrace (10-30 mamsl), the Upper Terrace (30-55 mamsl). This application area covers portions of the Lower and Middle Terrace. It needs to be pointed out that all the trenching done in this area as part of the De Beers exploration are primary trenches, which means that the trenches were placed across zones where marine gravels were delineated by drilling. No secondary trenches, which are used to delineate zones of enrichment found by primary trenching, have been done in the area.

The objective of the preliminary evaluation phase is to establish the global macro diamond grade and an initial estimate of value per carat to arrive at an Inferred Resource. If the results of this work are favourable, the project may move on to the evaluation phase (bulk sampling), where local grades and macro diamond values are established to arrive at a Measured Resource.

A risk decision is made each time a project moves or does not move from one phase to the next. A risk decision may be made to skip phases of the process for example the project may proceed to feasibility and mining directly from the preliminary evaluation stage. The way risk decisions are managed is to enter the available geological data into economic models with var-iables such as operating costs, capital costs, recovery factors, dilution, stripping ratios, etc. In this way, projects that are most likely and least likely to be viable can be prioritised, held or abandoned. The effect of changes in parameters such as diamond values, new technology, royalties, etc, can then be recognised in terms of their effect on the potential return on in-vestment for the project.

To prevent possible amendments to this prospecting work program at a later stage bulk sampling is also applied for although the bulk of the work will consist of pre-bulk sampling work. Ultimately the rest of the Prospecting Right Area must be examined to determine the prospectivity of the buried marine terraces as well.

The table below incorporates the information regarding the prospecting activities:

Table 2: Prospecting Work Program

Phase	Activity	Skill(s) required	Timeframe	Outcome	Timeframe for outcome	What technical expert will sign off on the outcome?
1	Non-invasive Literature Study Imagery Analysis Geological Mapping Geophysical Survey	Project Manager Geologist??	Month 1-12	Maps, plan & report on previous work. Delineation of potential gravel resource.	12 months	Project Manager
2	Preliminary evaluation Prospecting Pits	Project Manager Geologist??	Month 13-30	Diamond Ore Characterization (DOC) study for metallurgical purposes	18 months	Project Manager
3	Evaluation phase Bulk sampling (Trenching)	Project Manager Geologist??	Month 31-48	Diamond Ore Characterization (DOC) study for metallurgical purposes and to allow the sufficient recovery of diamonds for evaluation and foot printing purposes.	18 months	Project Manager
4	Final analysis, quality control, database update and resource statement	Project Manager Geologist Economist	Month 49-54	Feasibility study and decision making if results prove negative then decommissioning and final closure if results prove positive then continue with mining	6 months	Project Manager
5	Application for mining right or final decommissioning and closure	Project Manager	Month 55-60	Mining right or Closure certificate	6 months	Project Manager

3.1 Listed and specified activities

Table 3: Listed and specified activities

NAME OF ACTIVITY	Aerial extent Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE AUTHORISATION
The operation directly relates to prospecting of a mineral resource (diamonds) and requires a prospecting right in terms of section 16 of the MPRDA • Refer to Figure 1, 2 and 5: Mine Layout • Accessing the site via existing tracks and access roads to the area. • Prospecting pits will be developed as shown in Fig 4 • After results are logged the pit will be backfilled immediately for security and safety reasons before the project moved to the next pit position. • In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation. • No water will be extracted or used during exploration activities. • Temporary stockpiling of topsoil, and overburden in separate stockpiles as shown in Fig 4. • Refuse collection containers. • Mobile ablution facilities	Total Area ±412Ha Disturbance footprint max 5Ha	X	GNR 983 Listing Notice 1 of 2014 (dated 8 December 2014), as amended by GN 517 GG 44701 (dated 11 June 2021): Activity 20: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the MPRDA, as well as any other applicable activity as contained in Listing Notice 1 or in Listing Notice 3 of 2014, required to exercise the prospecting right.”;	NA
Processing and recovery of diamonds No processing will take place and no Tailings and Fine residue (slimes) dumps will be created. No permission for the removal and disposal of a mineral required during preliminary evaluation phase	Not applicable at this stage to be applied for in terms of Sec 102 and EIA Reg 29 Part 2 amendment if required		GNR 984 Listing Notice 2 of 2014 (dated 4 December 2014), as amended by GN 517 GG 44701 (dated 11 June 2021): Activity19. The removal and disposal of a mineral, which requires a permission in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in Listing Notice 2, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the permission.";	
The rehabilitation, decommissioning and closure of the Prospecting Operation, which will only be required at final decommissioning and closure.	412Ha	X	GNR 983 Listing Notice 1 of 2014 (dated 8 December 2014), as amended by GNR 327 (dated 7 April 2017): **Activity 22:** The decommissioning of any activity requiring - (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	

The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a prospecting right	20 Pits combined have a stockpile volume of 5880m³	X		GNR 633 (dated 24/07/2015): Category A: Residue stockpiles or residue deposits (15) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit in terms of the Mineral and Petroleum Resources Development Act. 2002 (Act No. 28 of 2002). GNR 632 (dated 24/07/2015): Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation
OTHER ACTIVITIES (Associated infrastructure not considered to be listed activities) Access (temporary, jeep track roads less than 4m wide) Storage Facilities laydown and parking area Waste Management Facilities Temporary mobile storage facility Ablution Facilities mobile Storage of fuel in mobile fuel tanker in a bunded parking area and will be less than 80m³	< 1Km < 0.5Ha <80m³	Not listed		

3.2 Description of the activities to be undertaken

3.2.1 Description of Planned Non-Invasive Activities:

PHASE 1: Literature Study Imagery Analysis Geological Mapping Geophysical Survey

During this phase the desktop studies and studying of available information on surrounding exploration work that are already done will be supplemented by field observations. Ground Resistivity measurements may also be used to "home in" on target areas. Ground geophysical surveys involve the systematic measurement of magnetic, gravitational, and electromagnetic fields over target areas of interest within the property. These surveys are carried out using handheld instruments as shown in Figure 3 below.

The surveyor moves through the identified survey area on foot, using these instruments to gather data from the ground surface. The individual survey areas vary between 500 x 500 m to 2 x 2 km in extent depending on the inferred size of the target area. Magnetic survey lines are spaced at a maximum of 50 m apart and readings will be taken at a minimum of 5 m intervals along the lines. Electromagnetic and gravity survey lines are spaced at a maximum of 100 m apart with readings taken at a maximum of 50 m along the lines. This method of data collection is non-invasive and does not require clearance or disturbance of the vegetation therefore the only potential impact of this data collection process is inconvenience to the landowner, who would need to grant access to the survey site. After data collection has been completed, data processing and visualization is carried out to allow the interpretation of the survey. The final purpose of this phase will be to determine bedrock elevation contours and potential diamond traps

Figure 3: Typical Proton Magnetometer (Source: www.geophysical-equipments.com)

3.2.2 Description of planned invasive activities:

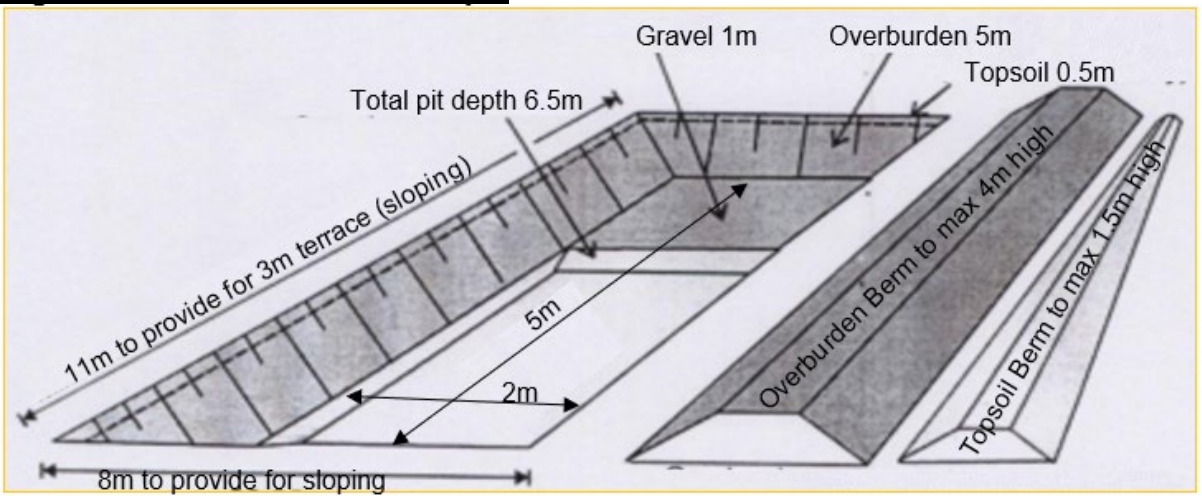
The objective of the preliminary evaluation phase is to determine a ballpark estimate of grade and size and thus possible in-situ value of the deposit. This is normally established by collecting mini samples by the most cost-effective method available. Due to the relative shallow overburden prospecting pits is the most common technique, and will be employed during this exploration program to allow for geological samples.

The results of the previous exploration program have indicated a series of small but very promising target areas across the entire prospecting area which are probably linked to paleo channels and raised marine beaches within the area (Figure 5).

Pit development will be the same as for trench development (Bulk Sampling) as shown in the diagrams below but on a much smaller scale and it is anticipated that no more than 20 such pits will be developed. After results are logged the pit will be backfilled immediately for security and safety reasons before the project moved to the next pit position. In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation.

The following volumes requiring earthmoving is only an estimation used in the costing exercise (Refer figure 4):
Pit floor to inspect and logged the gravel: 5.0m long and 2.0m wide (10m²)
Depth of Topsoil: 0.5m to be stockpiled separate from overburden
Depth of Overburden: 5m to be stockpiled separate from topsoil
Depth of Gravel: 1m to be logged and photographed
Total Depth of Prospecting Pit: 6.5m
Footprint including 3m bench: 11m long x8m wide (88m²)
Volume topsoil: 88m² X 0.5m = 44m³
Volume overburden: 50m² (average 88m² top & 10m² bottom) X 5m = 250m³
Volume gravel: 10m² X 1m = 10m³
Total earthmoving from 20 Prospecting pits: (44m³+250m³) X 20 = 5880m³
Note that gravel from the pits is not taken out and treated but left intact and closed after logging of results.

Figure 4: Schematic Pit Development



Bulk Sampling
If the results of this preliminary evaluation phase are favorable, the project may move on to the evaluation phase (bulk sampling), where local grades and macro diamond values are established to arrive at a Measured Resource.

The excavation and processing of bulk samples however requires a MPRDA section 20 permission that will trigger an additional listing activity in terms of LN 2 and require a different EA process and specialist studies that is not possible at this early stage. Therefore, LN2 Activity 19 is not applied for and the impact of the activity not assessed as part of this BAR application. A Part 2 amendment to the EA due to a change in scope will be applied for in terms of EIA Reg 31 if required.

3.2.3 Description of Pre-/Feasibility Studies:

The project geologist monitors the program, consolidates, and processes the data and amends the program depending on the results. This is a continuous process throughout the program and continues even when no prospecting is done on the ground. Each physical phase of prospecting is followed by desktop studies involving interpretation and modelling of all data gathered. These studies will determine the way the work program is to proceed in terms of activity, quantity, resources, expenditure, and duration.

3.2.4 Associated infrastructure

Accommodation and logistics will be provided at Silverdoos and Jurg se Kaia the base from which the company operates regarding their existing prospecting operations over Sea Concession 10A.

Equipment will be transported to site via the existing roads (including gravel and jeep track). No new roads will be required.

No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998) and no water reticulation will be laid-on to the mine work area(s) either.

No processing plant and services will be developed on the prospecting area.

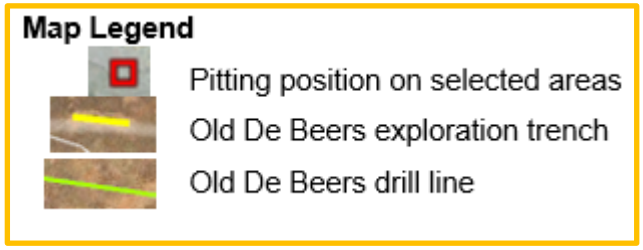
A temporary equipment laydown area will be developed at one of the informal campsites used for recreational activities. This is also the area where the earth moving equipment will be parked when not in use and will include secured storage (containerized storage) area and a mobile chemical toilet.

Fuel if required at the sampling areas will be contained in a mobile bowser provided with a bunded perking area.

3.2.5 Decommissioning phase

Planning for closure and restoration from the beginning of an operation makes the process easier; waste can be removed as it is created, disturbance can be planned so that topography restoration is less complicated, and topsoil can be re-used at shorter intervals. Site rehabilitation can make the land more valuable and attractive for resale. Additionally, establishing a closure strategy (and communicating that activity to the public) can help enhance the company's reputation as a socially-responsible operation. The decommissioning and closure phase at the end of the life of the mine will consist of implementing the Final Rehabilitation, Decommissioning and Closure Plan (attached at Annexure 1).

Figure 5: Proposed selected target areas for pre-bulk sampling work (geophysics and exploration pits) to be verified during redefinition of the area



South Section

North Section

4 Policy and Legislative Context

4.1 Table of Applicable Legislation and Guidelines

Table 4: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLIY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
Legislation		
Constitution of South Africa, specifically everyone has a right; a. to an environment that is not harmful to their health or wellbeing; and b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: i. prevents pollution and ecological degradation; ii. promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	Prospecting activities	The prospecting activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together avoided be minimised and mitigated in order to protect the environmental right of South Africans.
Minerals and Petroleum Development Resources Act, Act 28 of 2002 (MPRDA) section 16 (as amended) MPRDA Regulations as amended by GNR349 of 18 April 2011.	Application to the DMR for a prospecting right in terms of Section 16	The conditions and requirements attached to the granting of the Prospecting Right will apply to the prospecting activities. DMRE is the Competent Authority (CA) for this NEMA and NEM:WA application.

National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] NEMA requires that measures are taken that "prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development." In addition: • That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied; • That a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and • Sensitive, vulnerable, highly dynamic, or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.		
National Guideline on minimum information requirements for preparing Environmental Impact Assessments for mining activities that require environmental authorisation, published in terms of NEMA in Government Notice 86 of 2018	Application to the DMR for Environmental Authorisation in terms of the 2014 EIA Regulations as amended by the 2021 EIA Regulations. Refer to Table 3 for list of activities.	An Application for Environmental Authorisation must be submitted to DMR for an Environmental Authorisation (EA). The listed activities in Table 3 that are triggered determine the Environmental Authorisation (EA) application process to be followed, which is a BAR for this Prospecting Right. The appropriate EA must be obtained before proceeding with any prospecting activities in terms of the prospecting right application. The compilation of this BAR and the Public Participation Process is required in terms of NEMA.
National Environmental Management Act, 1998 (Act No. 107 of 1998): Financial Provisions Regulations in GNR 1147 (dated 20/11/2015), as amended by GNR 991 (dated 21/09/2018)	The Final Rehabilitation, Decommissioning and Mine Closure Plan included in APPENDIX 1:	The purpose of these Regulations is to regulate the determination and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation, and remediation of environmental impacts from prospecting, exploration, mining, or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future.
"Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" ("the Protocols"), in GG 43110 (dated 20 March 2020 came into effect on 15 May 2020), and GN 320. Themes included in this GN are agriculture; avifauna; terrestrial biodiversity; aquatic biodiversity; noise; defense; and civil aviation. Protocols in GG 43855 of GN No. 1150 dated 30 October 2020 provide for Terrestrial and Animal Plant Species.	Screening Tool Report, and Site Sensitivity Verification Report is attached as APPENDIX 2	A detailed site sensitivity assessment form part of section 9 in this BAR and is summarised in the Site Sensitivity Verification Report attached as APPENDIX 2

National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) [NEMBA] NEM:BA provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The National List of Threatened Ecosystems (Government Notice 1002 of 2011) lists threatened terrestrial ecosystems. NEM:BA also deals with endangered, threatened and otherwise controlled species, under the TOPS Regulations (Threatened or Protected Species Regulations - Government Notice 388 of 2013). The Act provides for listing of species as threatened or protected, under one of the following categories: Critically Endangered: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future. Endangered: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species. Vulnerable: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species. Protected species: any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category include, among others, species listed in terms of the CITES. A TOPS permit is required for any activities involving any TOPS listed species.		
National list of ecosystems that are threatened and in need of protection, 2011 (in GN 1002 dated 2 December 2011)	Section 9	In terms of the EIA regulations, a minimum of a basic assessment report is required for the transformation or removal of indigenous vegetation in a critically endangered or endangered ecosystem regardless of the extent of transformation that will occur.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004). National Dust Control Regulations in GN R827 of 1 November 2013 List of Activities which Result in Atmospheric Emissions, published in GN 893 of 2013 National Ambient Air Quality Standards (NAAQS), in GN 1210 of 2009 National Atmospheric Emission Reporting Regulations, in GN 283 of 2015	Section 9	In terms of Section 36 of the Act, the metropolitan and district municipalities are charged with implementing the AEL system. These regulations have informed the planning and management of emissions from the Project. Dust control measures are included in the EMPr
National Heritage Resources Act, 25 of 1999 (“NHRA”)	Section 9	An AIA and PIA will be done as well as an Underwater Heritage assessment to identify and shipwrecks or remains. Sensitive areas will be identified as no-go areas during sampling and all mitigation measures and conditions will form part of the EMPr. These will be submitted to SAHRA and HWC for comment

National Environmental Management: Waste Act, Act 59 of 2008 (NEMWA)NEM: WA (as amended) National Waste Information Regulations published in GN 625 of 2012 Waste Classification and Management Regulations in GN 634 of 2013 Waste listed activities in GN 921 of 2013 National Norms and Standards for the Storage of Waste, in GN 926 of 2013 National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste, in GN 1093 of 2017 National Norms and Standards for the Assessment of Waste for Landfill Disposal, in GN 635 of 2013 Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration, or production operation in GN 632 of 24 July 2015.	General waste management measures as part of environmental awareness plan	These regulations have informed the planning and management of waste for the Project. Listed activities triggered are included as part of the Environmental Authorisation (EA) application process. The generation of potential waste will be minimized through ensuring employees of the Applicant are subjected to the appropriate environmental awareness campaign before commencement of operations. All waste generated during the project will be disposed of in a responsible legal manner. Proof of legal disposal will be maintained on site.
Hazardous Substances Act, 1973 (Act No. 15 of 1973) (HAS)	Storage and control of hazardous substances to be included in EMPr.	The objective of the Act is to provide for the control of substances which may cause injury or ill health to or death of human beings due to their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure. In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule. The reagent chemicals to be used in the mineral processing plant, as well as chemicals typically found in petroleum products (for example) benzene, are regulated in terms of this Act. The processing plant, chemical storage area, fuel storage facility and refueling bay, with all appropriate controls in place, will not conflict with the Act. The EMPr will provide details in this regard.

National Water Act (Act 36 of 2008) Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources in GNR 704 of 1999 Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals in GNR 267 of 2017 Several General Authorisations have been published in terms of Section 39 of the NWA (various dates) Purification of Waste Water or Effluent, published in GNR 991 of 1984 Regulations for the erection, enlargement, operation, and registration of Water Care Works, published in GNR 2834 of February 1986	Section 9 for description of water resources in local area,	These regulations have informed the planning and management of water and stormwater arising from the Project A Water Use Authorisation (License or GA) in terms of Sec 21(c) and 21(i) is required for drilling within, or within 500m of any drainage channels. A Water Use Authorisation (License or GA) in terms of Sec 21(a) is required for abstracting groundwater. None of these activities are planned but if the situation changed the necessary application will be lodged.
Marine Living Resources Act 18 of 1998 (MLRA)	Section 9	Although there are several declared MPAs off the West Coast, the Applicant does not intend prospecting in these areas and consequently there will be no impact on these MPAs.
National Environmental Management: Integrated Coastal Management Act 24 of 2008	Section 9	NEM: ICMA provides for the integrated management of the coastal zone, including the promotion of social equity and best economic use, while protecting the coastal environment. Chapter 8 of the Act establishes an integrated system for regulating the disposal of effluent and waste into the sea. Section 70 prohibits incineration at sea and restricts dumping at sea unless done so in terms of a permit and in accordance with South Africa's obligations under international law. As the Applicant does not intend on disposing effluent and waste into the sea, no authorisations are required in terms of NEM: ICMA.
Mine Health and Safety Act, 1996 (No. 29 of 1996) (MHSA) and Regulations	Safety precautions to be considered by the Project Team in the prospecting planning.	The objective of the Act is to cover all aspects relating to health and safety of employees and other persons on the mine property. The Act places the responsibility on the mine owner for ensuring that the mine is designed, constructed and equipped in a manner which allows for a safe and healthy working environment.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) [PAJA]	Decision by the Competent Authority	Gives effect to section 33 of the Constitution that requires that "Everyone has the right to administrative action that is lawful, reasonable and procedurally fair". All administrative actions must be based on the relevant considerations

Protection of Personal Information Act, 2013 (Act No. 14 of 2013) (POPIA) Clarity On Applicability of The Protection of Personal Information Act, 2013 To Requirements of The Environmental Impact Assessment Regulations, 2014 Relating to Registers of Interested and Affected Parties and The Inclusion of Comments in Reports (circulated on 3 September 2021)	Annexure 2: PPP Report to be provided to the competent authority	The guidance document provided by the Department of Forestry, Fisheries and the Environment was used to determine the information to be included or excluded from the public domain to protect private or personal information.
Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA)	Comments required from the Local Municipalities.	Consent use in terms of the Municipal Planning By-Law, 2015 is required to permit mining on properties that are zoned for Agricultural purposes.
National Forest Act, 1998 (Act No. 84 of 1998) (NFA)	Comments required from Cape Nature.	Permit(s) will be required if any protected species are cut, removed and/or translocated from the Project footprints.
Provincial Environmental Legislation: Cape Nature and Environmental Conservation Ordinance 19 of 1974		
National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003) (NEM:PAA)		These regulations have informed the planning and management of the Project. The Project footprint does not overlap with any existing protected areas, or any areas identified for protected area expansion.
Municipal Plans and Policies		
Westcoast District Municipality Integrated Development Plan (IDP)	Section 5 & 9	The Need & Desirability of the project is referenced in terms of the District Municipality IDP, specifically relating to employment creation, and ensuring the implementation of environmentally sustainable practices, along with an integrated approach to addressing climate change response, which are included in the EMPr
Matzikama Local Municipality Integrated Development Plan (IDP),	Section 5 & 9	The Need & Desirability of the project is referenced in terms of the IDP, specifically relating to employment creation and sustainable resource utilisation. Relevant mitigation measures are included in the EMPr.
Western Cape Provincial Spatial Development Framework	Section 5 & 9	Sustainable development is a key consideration as addressed in this impact assessment report.
Western Cape Provincial Growth and Development Strategy	Section 5 & 9	Sustainable development is a key consideration as addressed in this impact assessment report.

Standards, Guidance and Spatial Tools		
Specialist Studies, Integrated Environmental Management, Information Series 4 (2002)	Section 13 and Table 18	This guideline was consulted to ensure adequate development of terms of reference for specialist studies.
Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11 (2004)	Section 6	This guideline was consulted to inform the consideration of alternatives.
Environmental Management Plans, Integrated Environmental Management, Information Series 12 (2004)	Part B,	To be included in the EMPr phase.
Environmental Impact Reporting, Integrated Environmental Management, Information Series 15 (2004)	Section 5 & 9	
Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute. 2013. Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Pretoria.	Section 5 & 9	The mitigation measures to address and mitigate the potential impacts of the mining are included in the EMPr.
DEA Guideline on Need & Desirability (2017)	Section 5	Refer to Section 5
Public Participation guideline in terms of NEMA EIA Regulations (2017), Department of Environmental Affairs, DMR Guideline on Consultation with Communities and I&APs	Section 7	Refer to Section 7
DEAT Integrated Environmental Management Information Series 5: Impact Significance (2002)	Section 9	Refer Impact Assessment Table
DEAT Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Section 9	Refer Impact Assessment Table
SANBI BGIS databases (www.bgis.sanbi.org)	Baseline environmental description in Section 9	Used during desktop research to identify sensitive environments within the prospecting area.

In addition to the foregoing, the Applicant must also comply with the provisions of other relevant conventions and legislation, which includes, amongst others, the following:

4.2 International Conventions

- International Convention for the Prevention of Pollution from Ships, 1973/1978 (MARPOL);
- Amendment of the International Convention for the Prevention of Pollution from Ships, 1973/1978
- (MARPOL) (Bulletin 567 – 2/08);
- International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC
- Convention);
- United Nations Convention on Law of the Sea, 1982 (UNCLOS);
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the London Convention) and the 1996 Protocol (the Protocol);
- International Convention relating to Intervention on the High Seas in case of Oil Pollution Casualties (1969)
- and Protocol on the Intervention on the High Seas in Cases of Marine Pollution by substances other than oil (1973);
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (1989); and
- Convention on Biological Diversity (1992).

4.3 Other South African Legislation

- Carriage of Goods by Sea Act, 1986 (No. 1 of 1986);
- Dumping at Sea Control Act, 1980 (No. 73 of 1980);
- Hazardous Substances Act, 1983 and Regulations (No. 85 of 1983);
- Marine Living Resources Act, 1998 (No. 18 of 1998);
- Marine Traffic Act, 1981 (No. 2 of 1981);
- Marine Pollution (Control and Civil Liability) Act, 1981 (No. 6 of 1981);
- Marine Pollution (Prevention of Pollution from Ships) Act, 1986 (No. 2 of 1986);
- Marine Pollution (Intervention) Act, 1987 (No. 65 of 1987);
- Maritime Safety Authority Act, 1998 (No. 5 of 1998);
- Maritime Safety Authority Levies Act, 1998 (No. 6 of 1998);
- Maritime Zones Act 1994 (No. 15 of 1994);
- Merchant Shipping Act, 1951 (No. 57 of 1951);
- Mine Health and Safety Act, 1996 (No. 29 of 1996);
- National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004);
- National Environmental Management: Integrated Coastal Management Act, 2008 (No. 24 of 2008);
- National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003)
- National Heritage Resources Act, 1999 (No. 25 of 1999);
- National Ports Act, 2005 (No. 12 of 2005);
- National Water Act, 1998 (No. 36 of 1998);
- Occupational Health and Safety Act, 1993 (No. 85 of 1993) and Major Hazard Installation Regulations;
- Sea-Shore Act, 1935 (No. 21 of 1935);
- Sea Birds and Seals Protection Act, 1973 (No. 46 of 1973);
- Ship Registration Act, 1998 (No. 58 of 1998);
- South African Maritime Safety Authority Act, 1998 (No. 5 of 1998);

- South African Maritime Safety Authority Levies Act,
- Wreck and Salvage Act, 1995 (No. 94 of 1995).

5 Need and desirability of the proposed activities

5.1 Mining and Biodiversity Guidelines (2013)

The Mining and Biodiversity Guidelines (2013)[1] state that: "Sustainable development is enshrined in South Africa's Constitution and laws. The need to sustain biodiversity is directly or indirectly referred to in several Acts, not least the National Environmental Management: Biodiversity Act (No. 10 of 2004) (hereafter referred to as the Biodiversity Act) and is fundamental to the notion of sustainable development. International guidelines and commitments as well as national policies and strategies are important in creating a shared vision for sustainable development in South Africa."

DMR, as custodian of South Africa's mineral resources, is tasked with enabling the sustainable development of these resources. This includes giving effect to the constitutional requirement to "prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development"[2].

The primary environmental objective of the MPRDA is to give effect to the "environmental right"[3] contained in the South African Constitution. The MPRDA further requires the Minister to ensure the sustainable development of South Africa's mineral resources, within the framework of national environmental policies, norms, and standards, while promoting economic and social development.

The Mining and Biodiversity Guidelines (2013) document identifies four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining. The categories of relevance to this Prospecting Right area as shown in Figure 6 are: Category B: Highest Biodiversity importance – highest risk for mining and Category C: High Biodiversity Importance – high risk to mining.

These categories have since been super-ceded by the Critical Biodiversity Area (CBA) map (Section 9), which would be interpreted as Category B is now CBA 1, Category C is now CBA 2 and Category D is now Ecological support areas. These categories basically require an environmental impact assessment process to address the issues of sustainability.

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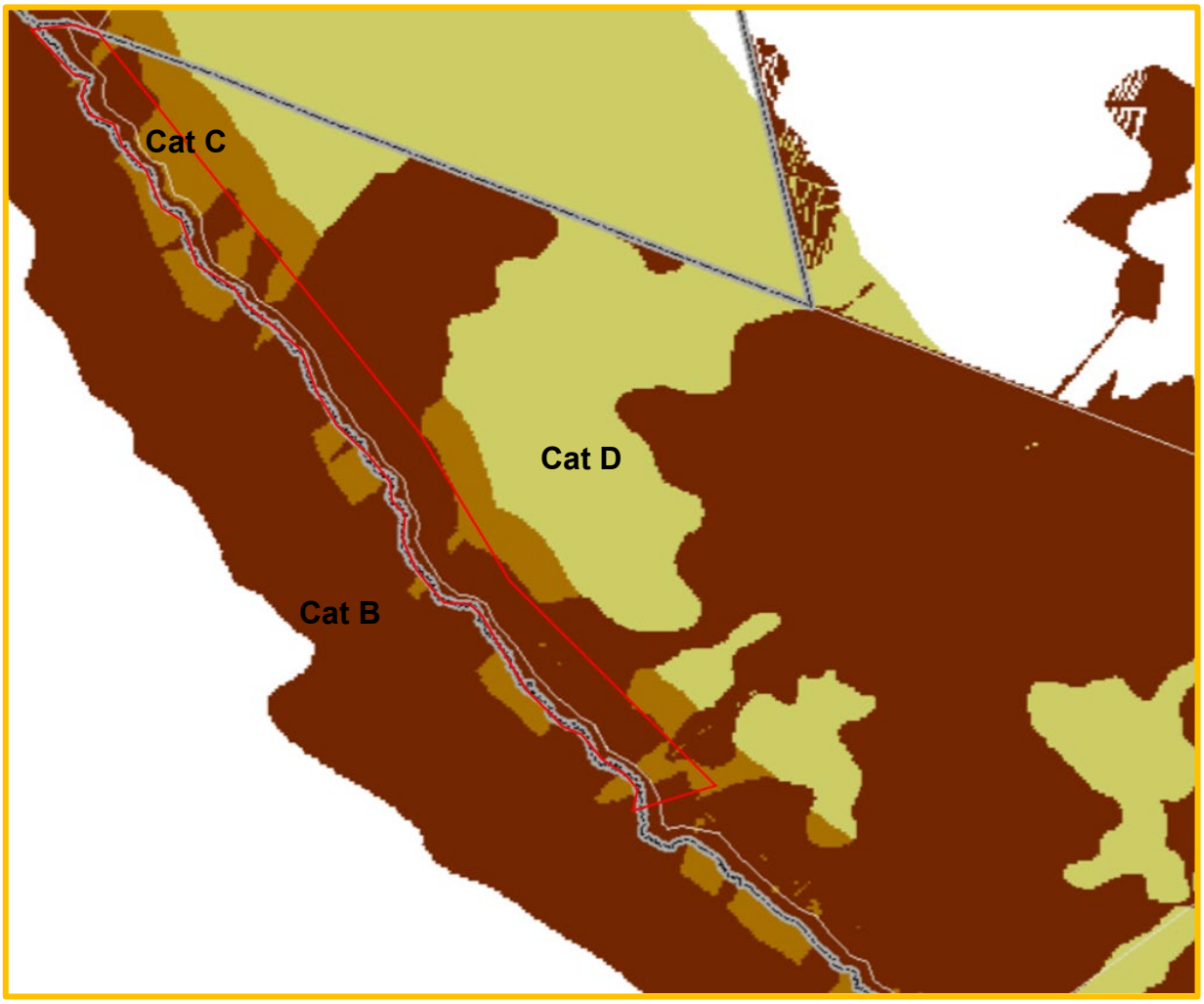
[1] Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute. 2013. Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Pretoria.

[2] Constitution of the Republic of South Africa (No. 108 of 1996).

[3] Section 24 of the Constitution states that "everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Figure 6: Location of Prospecting area in terms of Mining and Biodiversity Guidelines sourced off SANB BGIS Map Viewer



5.2 Employment benefits

The proposed prospecting activity is a temporary land use, and the area will be rehabilitated in accordance with the Mining Closure and Rehabilitation Plan, attached as Annexure 1. The benefits of the project can be divided into social and economic classifications.

In terms of employment opportunities and job security, the prospecting activities themselves would not directly lead to job opportunities. Should prospecting activities prove that a feasible resource mineral is present to allow for mining, a new mine may be developed which would generate extensive employment opportunities in an area where employment is needed. The proposed prospecting operation will however assist in providing job security, local employment, local skills transfer, and economic upliftment, in a sustainable manner.

5.3 West Coast District Municipality IDP

The West Coast District Municipality extends over an area of 31 099 km2 and has a total population of 464 056 inhabitants and 122 074 households (Table 5). The district includes five local municipalities (Matzikama, Cederberg, Bergrivier, Saldanha Bay, and Swartland) which all have access to the Atlantic Ocean as well as the N7 national road (with the exception of Saldanha municipality) (WCDM, 2021). The population consists of 50.3% female and 49.7% male, with three predominant population group; Coloured (66.58%), Black African (16.36%), and White (15.71%) communities.

Most of the populations' first language is Afrikaans (83.67%) followed by IsiXhosa (8.58%), English (3.98%) and other indigenous languages (IsiNdebele, Sesotho, and Setswana).

The WCDM population dependency ratio is quite high (45.9%) with 68% in the working age group (15-64 years), followed by the young (25%, 0-14 years) and the elderly group (7%, 65+ years). A high dependency ratio puts greater strain on people who are part of the workforce to support their economic dependents (children and elderly people). A higher dependency ratio also means greater pressure on social systems and the delivery of basic services. The level of education in the WCDM is relatively low, with a literacy rate was 79.1% (lower than the average of the Western Cape's 87.2% and slightly lower than the rest of South Africa 80.9%) (Socio Economic Profile West Coast District Municipality). The dropout rate for high school learners (Grades 10 to 12) within the West Coast local municipalities varied from 23.2% to 33%. These high levels of dropouts were influenced by socio-economic factors such as teenage pregnancy, availability of no-fee schools and unemployment (Socio Economic Profile West Coast District Municipality). The average income in the WCDM fall within three ranges: no income (10.5%), R1 to R9 600 per annum (5.3%) and R9 601 to R76 400 per annum for which most of the population can be categorised (57.8%). There were 183 969 people employed in the WCDM in 2018, which constitutes 7.1% of the total employment in the Western Cape. The WCDM experienced an average annual increase of 3 480 jobs over the period 2014-2018, with the Swartland municipality generating the most employment opportunities of 1 146 in the last year, conversely to Matzikama and the Bergriver municipality which only created some 546 jobs. In 2019, the WCDM experienced a loss of 389 jobs, which will have a significant impact on the WCDM economy if this trend continues.

The WCDM experienced the slowest economic growth in the Western Cape between 2005-2013, averaging 3.0% (WCDM 2021). In contrast, the province showed a growth rate of 6.8% over the same period. The West Coast experienced strong growth in its construction (6.2%) and commercial services (6.1%), which include wholesale and retail trade, catering and accommodation; transport, storage and communication; and finance, insurance, real estate and business services sectors (WCDM 2021). The sectors that experienced a reduction over the 2005-2013 period was the agriculture (0.3%), manufacturing (0.3%) and other sectors (3.0%). The general government and community, social and personal (CSP) services sector in the West Coast experienced a steady 2.8% growth. The largest sectors in the West Coast economy in 2013 were the finance, insurance, real estate, and business services (27%), manufacturing (017%), agriculture, forestry and fishing (14%) and wholesale and retail trade, catering and accommodation services (13%) (WCDM 2021). The agriculture, forestry and fishing sector were the primary source of employment, with 70 060 jobs in 2018, contributing 38.1% to total employment in the WCDM. However, the agriculture, forestry and fishing sector contributed the most to the WCDM employment in 2018 (38.1%, or 70 060 jobs).

Table 5: Demographic profile summary of the West Coast District Municipality and Strandfontein

Indicator	West Coast District	Strandfontein
Population Total	391 766	431
Household Total	106 781	92
Area (km²)	31 118.6	4.18
Population group		
Coloured (%)	66.58	14.8
Black African (%)	16.36	50.6
White (%)	15.71	33.2
Indian or Asian(%)	0.56	0.9
Other (%)	0.79	0.5
Gender distribution		
Male (%)	49.7	51.4
Female (%)	50.3	48.6
Indicator	**West Coast District**	**Strandfontein**
First language		
Afrikaans (%)	83.67	69.4
English (%)	3.98	3.2
IsiXhosa (%)	8.58	22.6
Setswana (%)	0.63	0
Dependency ratio	45.9	18.1
Average annual income		
No income		10.9
R1 – R9 600 (%)		3.3
R9 601 – R76 400 (%)		47.8
R76 400–R614 400 (%)		38

The vision of the West Coast District Municipality IDP is: "Weskus the caring centre for innovation & excellence."

The West Coast District Municipality's (WCDM) Integrated Development Plan 2017 – 2022 notes that it has "a vast number of mineral resources, of which some are currently not being exploited" and deems that "mining could potentially make an increased economic contribution to the WCDM economy when these unexploited resources are utilised in future".

The Mission Statement is:

- Promote drivers of change, by leading well-coordinated and innovative initiatives to achieve sustainable and integrated development of West Cost;

The Strategic Objectives are

- Care for the social wellbeing, safety, and health of all our communities.
- Promote regional economic growth and tourism

- Co-ordinate and promote the development of bulk and essential services and transport infrastructure
- Foster sound relationships with all stakeholders, especially local Municipalities
- Maintain Financial Viability and Good Governance

Values

- Integrity- accountability and ethics to the citizens.
- Transparency- to be transparent and open in our business.
- Loyalty- putting the organisation first.
- Respect- will treat public and colleagues with fairness, respect, and consideration.
- Quality- achieving or exceeding measurable standards.
- Ownership- taking pride in our work.
- Teamwork- working together to achieve our goals.

5.4 Matzikama Local Municipality IDP

The Matzikama municipality is situated on the north-west coast of the Western Cape and borders the Northern Cape Province (Kamiesberg municipality in the north and Hantam municipalities in the east), the Atlantic Ocean on the west, and the Western Cape (Cederberg municipality) in the south (WCDM 2021). The municipality consist of 18 towns, with three coastal settlements (Doringbaai, Papendorp, and Strandfontein) and several small inland towns which serves as agriculture service centres (Ebenhauser, Lutzville, and Koekenaap) (MM 2019; WCGPT 2018). Matzikama municipality is defined by an arid environment with a flourishing natural irrigation system sustained by the Olifants River. The Olifants River (Vanrhynsdorp Government Scheme) consist of 237 km canals and supply water for several towns, industrial and domestic waste, local agriculture, and irrigation (DWS 2019). Most of the economic activities are concentrated in the south of the municipality, with Vredendal being the largest town and primary economic node (WCGPT 2018). The agriculture sector is largely attributed by the viniculture industry and combined with the forestry and fishing sector contributed the most towards Matzikamas municipal GDP and employment in 2018 (Mayson et al., 2020; MM 2019). The agriculture, forestry and fishing sector employed approximately 25 492 people in 2014 consisting of a mixed workforce of semi-skilled and unskilled workers (PGWC 2018). Matzikama's real GDPR per capita in 2018 was R39 000 which is considerably lower than most surrounding municipalities, including the WCDM (at R59 000). Matzikama municipality real GDPPR decreased between 2018 and 2019 by 2.5%, in addition to a low GDP growth rate of 2.1% over the period 2008-2017, which is 0.3% less than the WCDM average growth rate (WCDM 2021; MM 2020). It is estimated that the Matzikama municipality experienced its largest decline in its annual GDP growth rate in 2019 (4%) when compared to the GDP growth rate between 2014 and 2018 (MM 2021/22). It is anticipated that the COVID-19 pandemic will worsen Matzikama's local economy as a decline in economic performance has already been observed since 2018. A further reduction in municipal revenue, unemployment in the private sector, land grabs for informal housing and the stagnation of development programs is likely to occur in 2021. (MM 2021/22).

5.5 Western Cape Provincial Spatial Development Framework (PSDF)

The aim of the Western Cape Spatial Development Framework (PSDF) is to:

- gives spatial expression to the national and provincial development agendas,
- serve as a basis for coordinating integrating and aligning on the ground delivery of national and provincial departmental programmes,
- support municipalities to fulfil their municipal planning mandate in line with the national and provincial agendas, and

- communicates government's spatial development intentions to the private sector and civil society."

The Goals of the PSDF is to take the Western Cape on a path towards:

- more inclusivity, productivity, competitiveness, and opportunities in urban and rural space-economies;
- better protection of spatial assets (e.g., cultural, and scenic landscapes) and strengthened resilience of natural and built environments; and
- improved effectiveness in the governance of urban and rural areas."

The rural economy includes but is not limited to farming; fishing and aquaculture; mining; forestry; commodity processing and servicing; eco and agri-tourism; outdoor recreation and events; infrastructure and service delivery; and diverse natural resource related activities (e.g., extraction, rehabilitation, harvesting, etc.). Agriculture is going through a difficult transition period with its traditional export market in recession, escalating pressure on operating margins (i.e., input costs escalations exceed commodity price increases), more stringent international and national compliance requirements, and instability in the labour market as well as the after effects of an unprecedented drought.

5.6 DEA Guideline on Need and Desirability

As referenced in the DEA Guideline on Need and Desirability (2017), NEMA defines "evaluation" as "the process of ascertaining the relative importance or significance of information, in the light of people's values, preferences and judgements, in order to make a decision." In evaluating each impact (negative and positive) in terms of each of the aspects of the environment, "need and desirability" must specifically be considered in the analysis of each impact of the proposed activity. However, to determine if the proposed activity is the best option when considering "need and desirability" it must also be informed by the sum of all the impacts considered holistically. In this regard "need and desirability" also becomes the impact summary regarding the proposed activity.

These Guidelines state that: "In considering the impact summary it must be remembered that ultimately the aim of EIA is to identify, predict and evaluate the actual and potential risks for and impacts on the geographical, physical, biological, social, economic and cultural aspects of the environment, in order to find the alternatives and options that best avoid negative impacts altogether, or where negative impacts cannot be avoided, to minimise and manage negative impacts to acceptable levels, while optimising positive impacts, to ensure that ecological sustainable development and justifiable social and economic development outcomes are achieved".

The **principles of Integrated Environmental Management (EIM)** as set out in Section 23 of NEMA have been considered in this environmental assessment as explained below.

- **Environmental management placing people and their needs at forefront of its concern, and serve their physical, physiological, developmental, cultural, and social interests equitably** – This process is being undertaken in a transparent manner and all effort is being been made to involve all the relevant stakeholders and interested and affected parties. Public participation is being undertaken to obtain the issues / concerns / comments of the affected people for input into the process. Refer to Section 7 in this report.
- **Socially, environmentally, and economically sustainable development** – All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures have been proposed to ensure that the impact is mitigated, and these are detailed and included in the EMPr.

- **Consideration for ecosystem disturbance and loss of biodiversity** – the project site includes portions identified as Critical Biodiversity Areas (CBA 1 and CBA 2) (**Figure 18 and 19)**. The vegetation type found on site is not listed in the "National List of Threatened Ecosystems that are Threatened and in Need of Protection" in GN 1002 dated 9/12/2011. Ecosystem disturbance and loss of biodiversity are considered in the impact assessment. The prospecting process is a relatively benign type of operation. Rehabilitation back to the natural state is a key component and will be undertaken in a phased manner as the activities progress. This EMPr and the Final Rehabilitation, Decommissioning and Closure Plan (Closure Plan) (Annexure 1) proposes mitigation measures which will minimise the impacts of the operation on the environment.
- **Pollution and environmental degradation** – The implementation of recommendations made and proposed mitigations are detailed in the EMPr, and Closure Plan to ensure minimum environmental degradation.
- **Landscape disturbance** – All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures have been detailed in the EMPr and Closure Plan to ensure that the impacts are mitigated. For example, landscape disturbance impacts associated with the excavations, surface disturbance, erosion and dust have been identified and detailed mitigation measures are included in the EMPr to minimise the impacts.
- **Waste avoidance, minimisation, and recycling** – These aspects were considered and incorporated into the EMPr and the Closure Plan.
- **Responsible and equitable use of non-renewable resources** – These aspects have been considered and there is not much scope to reduce the use of non-renewable resources, such as vehicle transport.
- **Avoidance, minimisation, and remedying of environmental impacts** - All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures will be proposed to ensure that the impact is mitigated. Several mitigation measures have been included in the EMPr and the Closure Plan.
- I**nterests, needs and values of Interested and Affected Parties** – This process has been undertaken in a transparent manner and all effort is being made to involve all the relevant stakeholders and interested and affected parties (I&APs). Comments received from I&APs on the Draft Basic Assessment Report will be included as part of this Basic Assessment Report as summarised in Section 7, Table 6.
- **Access of information** – Potential Interested and Affected Parties were notified of the proposal and the availability of the BAR. They were also notified of having the opportunity to register as an I&AP and registered I&APs have been kept informed of the commencement of the Basic Assessment process.
- **Promotion of community well-being and empowerment** – This process is being undertaken in a transparent manner and all effort is being made to involve all the relevant stakeholders and registered I&APs.

Potential impacts on the biophysical environment and socio-economic conditions have been assessed, and steps have been taken to mitigate negative impacts, and enhance positive impacts. Adequate and appropriate opportunity is being provided for public participation. Environmental attributes have been considered based on the available information, and environmental management practices have been identified and established to ensure that the proposed activities will proceed in accordance with the principles of IEM.

6 Motivation for the overall preferred site, activities, and technology alternative.

No site or technology alternatives have been considered for this prospecting application. The areas included in the prospecting rights application were identified through historical prospecting and production records for the area and from designated research. Diamond exploitation and exploration in the general area has been ongoing for many years and the area applied for is located within relatively close proximity to known diamond mines, which is therefore considered highly prospective.

The objective of the preliminary evaluation phase is to determine a ballpark estimate of grade and size and thus possible in-situ value of the deposit. This is normally established by collecting mini samples by the most cost-effective method available. Due to the relative shallow overburden prospecting pits is the most common technique, and will be employed on areas where bedrock elevation is less than 5 meters and will concentrate within historic exploration trenches.

7 Details of the Public Participation Process Followed

7.1 Introduction

The public participation process has been conducted according to the requirements as prescribed in Regulations 40 to 44 of the EIA Regulations, 2014 (as amended).

The formal public participation process, which meets the requirements of the NEMA EIA Regulations and the MPRDA has been followed and include the following activities:

In terms of NEMA EIA Regulation 41 Potential I&APs were notified about the project and of commencement of the Basic Assessment (BA) process and invited to register as interested and affected party by means of:

- Written notifications to State departments that administers a law relating to a matter affecting the environment in terms of NEMA EIA Reg 43(2) together with a Notice of Intent to develop (NID) and Background Information Document (BID);
- Written notifications to directly affected landowners together with a Notice of Intent to develop (NID) and Background Information Document (BID);
- Written notifications to other stakeholders including neighbours, relevant Government Departments, Local and District Municipalities (including traditional authorities where applicable) together with a Notice of Intent to develop (NID) and Background Information Document (BID); and
- The general public were notified by means of site notices and media advertisements.

7.2 Summary of issues raised by I&Aps

To be completed as part of the Final Basic Assessment Report. Annexure 2 provide for proof of consultation and will only be provided to the competent authority as it contains personal information that requires protection in terms of the Protection of Personal Information Act, 2013 (POPI)

Only Reg 43(2) Government Departments and registered interested and affected parties that has discloses their direct business, financial, personal, or other interest which that party may have in the approval or refusal of the application are given the opportunity to review and comment on this Draft Basic Assessment Report in terms of NEMA EIA Reg 43.

Only registered I&APs will be notified of the outcome of the environmental authorisation, their right to appeal the decision and if required the appeal process to be followed.

Table 6: Summary of issues raised by registered I&Aps

8 Process to reach the proposed preferred alternative

8.1 Site alternatives

8.1.1 Location

As discussed above, the prospecting location has been informed by historical prospecting and production records. As such the applicant believes there is a possibility of encountering diamond reserves on the property subject to this prospecting right application. Until such time that the non-invasive activities have been completed the exact location of the sampling sites cannot be confirmed. However, the following restrictions will be applied to the final site selection:

- No sampling site will be positioned within 500m of a structure.
- No sampling site will be positioned within 100m of a graveyard.
- No sampling site will be positioned within 100m of a freshwater system (Wetlands).
- Where possible existing access roads will be utilised to access the sampling sites.

8.1.2 Type of activity

The Applicant is not the land owner, so it would not be realistic for this company to propose another type of activity, as their core business is the mining of diamonds. The applicant is required to rehabilitate the environment affected by prospecting to its natural state or to another predetermined land use. The prospecting activity takes place over a relatively short time period, so the selection of the best post-mining long term land use is an important consideration. In the case of this application the best post-mining land use alternative is to return the area to its natural state considering existing disturbances due to recreational activities, mining, and overgrazing. Other activity alternatives have therefore not been considered as the purpose of the proposed project is to explore the area for diamonds as indicated. The only other activity required to be assessed in terms of NEMA is the "do-nothing" alternative, as detailed further below.

8.1.3 Design or Layout of activity

The outcomes of the non-invasive Phase 1 prospecting activities will inform Phase 2 and the layout of the sample sites may therefore be refined based on the detailed findings of the ongoing desktop review and mapping exercises

Site establishment is done with closure in mind to ensure that only the minimum required footprint is disturbed. No camp site will be erected on site, as existing establishments at Silverdoos and Jurg se Kaia will be used.

The design or layout of an exploration project is determined by the shape, position, and orientation of the mineral resource. Geophysical methods have been proven to be very useful in detecting potential targets together with local experience in diamond mining and will therefore be used to identify optimal locations of potential mineralisation of economic interest within the prospecting area prior to sampling.

- The preferred and only location of the sampling activity is on the earmarked section.
- The preferred and only activity is the prospecting for any potential mineral mineralisation.

The significance of the environmental impacts associated with different possible design or layout alternatives would be very similar, therefore layout alternatives have not been assessed.

8.1.4 The technology to be used in the activity;

Regarding technologies, evaluation of a diamond deposit is the process followed to establish economic viability and to identify the "footprint" of the deposit. The "footprint" is a profile of the type of diamonds present, which may be important for market planning. Economic sensitivity analyses indicate that all diamond deposits are most sensitive to diamond value and grade, and these are the dominant factors that influence the decision to proceed with a project.

The objective of this is a preliminary evaluation phase to establish the global macro diamond grade and an initial estimate of value per carat to arrive at an Inferred Resource.
If the results of this work are favorable, the project may move on to the evaluation phase (bulk sampling), where local grades and macro diamond values are established to arrive at a Measured Resource.
If conceptual economic modelling of the measured resource indicates that the deposit may be viable, then the project will move to the feasibility and mining phase.
A risk decision is made each time a project moves or does not move from one phase to the next. A risk decision may be made to skip phases of the process for example the project may proceed to feasibility and mining directly from this preliminary evaluation stage. The way risk decisions are managed is to enter the available geological data into economic models with variables such as operating costs, capital costs, recovery factors, dilution, stripping ratios, etc. In this way, projects that are most likely and least likely to be viable can be prioritised, held, or abandoned. The effect of changes in parameters such as diamond values, new technology, royalties, etc., can then be recognised in terms of their effect on the potential return on investment for the project.
The methods detailed in the Prospecting Work Program (PWP) and summarized in table 2 above would be used to investigate the area and it is not possible to give details of the position of sample sites before the surveys and surface work is completed. The prospecting activities proposed) follow a phased approach, whereby the preceding phase determines if further work is warranted and as a result no alternatives are available to complete the proposed prospecting activities.
The prospecting methodologies have been chosen based on the applicant's experience with diamond prospecting, and is standard practice for such prospecting. The objective of the preliminary evaluation phase is to determine a ballpark estimate of grade and size and thus possible in-situ value of the deposit. This is normally established by collecting mini samples by the most cost-effective technology available. Due to the relative shallow overburden prospecting pits is the most common technique, and will be employed on areas where bedrock elevation is less than 5 meters.

8.1.5 Operational alternatives

The non-invasive prospecting component will enable the applicant to clearly delineate areas which are regarded as suitable for further investigation without unnecessarily disturbing the prospecting area through invasive means.
During the invasive prospecting component of the project, the following key site activities related to collection of samples will be undertaken:

- Establishment of sample sites with equipment laydown area and temporary overburden dump sites.
- Establishment of access to sample sites
- Sampling operations (e.g., pit excavation and gravel sampling)
- Rehabilitation activities (e.g., backfilling of pits and scarifying disturbed areas)

Alternative time frames can be made to ensure that the impact on the day to day running of the inherent land use are minimised, for example sampling can be scheduled not to coincide with the summer and easter holidays when the area is utilized by the local community as informal camp sites. Prospecting activities will be conducted during daylight hours to minimize exposure to light and noise pollution.
If necessary certain sampling can be timed to occur only during weekdays as may be required in certain instances by stakeholders. The time of implementing sampling activities during the day may also be reconsidered in consultation with landowners.

Ideally sampling activities will occur continuously until such time that sample is completed and area rehabilitated, with no operations during the night.
At present, no feasible alternatives to pitting and or drilling are available and impacts associated with the sampling operation will be monitored and managed in terms of the EMPr. There are no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory "no-go" alternative that must be assessed for comparison purposes as the environmental baseline.

8.1.6 The No-go Alternative

The no-go alternative will mean that no prospecting activities are undertaken. Sampling is required in order to investigate the potential and feasibility of a resource and to generate a SAMREC compliant mineral resource statement. There is no potential for any future investment in a mine without the confirmation of the mineral resources which can only be obtained through sampling activities.
Should the prospecting right be refused, effectively a potential mineral resource will be sterilised. The socio-economic benefit and most notably the future employment potential of a mine development will also be lost if the prospecting activities are not implemented in order to determine the feasibility of any mineralisation within the area. This will mean that the possible existence of economically exploitable minerals will not be known, and in turn none of the benefits associated with the project will be realised (e.g., job creation and stimulation of the local economy). The applicant would also not have the opportunity to utilise (exploit) the possible mineral reserves. Should the prospecting activities not be permitted, then the potential environmental impacts associated with the establishment and sampling would not occur, and the status quo would be maintained for the specific site. The potential environmental impacts will however still be present in the surrounding area due to adjacent large-scale mining of salt and heavy minerals.

9 Baseline Environment (Site sensitivity)

9.1 Regional setting

The prospecting area is located at Karoetjes Kop north of the Sout River along the west coast which lies in the magisterial district of Vanrhynsdorp, in the Matzikama Local and West Coast District Municipalities of South Africa (MLM and WCDM respectively). The Prospecting area is remote, with the nearest formal community of Koekenaap located more than 50 km to the south-east of the prospecting site. The nearest town to the area (Nuwerus) lies 55 km to the east along the R363 (Figure 1 & 2).
According to the screening report (DEA) no wind or solar developments found within 30 km of the prospecting area and no intersections with Environmental Management Framework areas are present. The area comprises of livestock farming (sheep) and coastal environment utilized for recreation. Salt mining and large-scale strip mining and beach mining is taking place to the south.
This prospecting operation will concentrate mostly on the historic working by DeBeers as some of the results on recovery of diamonds for these areas were made available. These areas are mostly situated within Portion 1 of the Farm Karoetjies Kop 150 belonging to the State and the only land use is uncontrolled recreational activities with ad hoc campsites during the crayfish season. Most of the tracks were developed as a result of these informal camping and the only permanent infrastructure on this property, Silverdoos and Jurg se Kaia, was also develop as informal campsites. This infrastructure is now leased from the Department Public Works by this company as part of their prospecting operations in Sea Concession 10A. Due to the small scale of this prospecting project no new infrastructure will be developed and existing tracks

will be utilised. The closure objective of historic mining operations was only to make the area safe with no regard to preparation of the area for revegetation and therefore natural rehabilitation of the transformed areas due to trenches are very slow and is further hampered by the continuous use of the areas as campsites. During this operation the same areas will also be used for parking area for equipment. The environmental impact due to laydown areas will be the same as for the informal campsite during the easter and summer holidays.

9.2 Biophysical Characteristics

9.2.1 Topography

The geology and topography of the area, together with the semi-arid climate and the proximity to the coast, have determined the basic landscape features and visual elements of the study area. The study area is characterised by undulating topography sloping gently to the west. The inland area is covered with vegetated sand dunes aligned north to south. The highest elevation is in the east of the study area gradually decreasing towards the coast in the west. Elevations range from >60 m above mean sea level (mamsl) along the eastern boundary down to 0 mamsl along the western coastal boundary of the study area (Figure 2).

The coastline is dominated by exposed rocky headlands alternating with fine grained sandy beaches often backed by a rocky and/or sandy escarpment. Wavecut platforms and pebble beaches are absent along this stretch of the coastline. The coastline included in this application form part of the Southern Benguela Ecoregion. The coastline of the study area is characterised by Sandy Shores (S- Shores), Rocky Shores (R- Shores) Mixed Shores, and Estuaries. Much of the coastline between Hondeklipbaai and the Olifants River mouth comprises sandy shores. Sandy beaches are one of the most dynamic coastal environments. Except for a few beaches in large bay systems (such as St Helena Bay, Saldanha Bay, Table Bay), the beaches along the South African West Coast are typically highly exposed. Exposed sandy shores consists of coupled surf-zone, beach, and dune systems, which together form the active littoral sand transport zone (Short & Hesp 1985).

Three morphodynamic beach types are described: dissipative, reflective, and intermediate beaches (McLachlan et al. 1993). Generally, dissipative beaches are relatively wide and flat with fine sands and low wave energy. Waves start to break far from the shore in a series of spilling breakers that ‘dissipate’ their energy along a broad surf zone. This generates slow swashes with long periods, resulting in less turbulent conditions on the gently sloping beach face. Reflective beaches in contrast, have high wave energy, and are coarse grained (>500 pm sand) with narrow and steep intertidal beach faces. The relative absence of a surf-zone causes the waves to break directly on the shore causing a high turnover of sand. Intermediate beach conditions exist between these extremes.

There are 64 estuarine systems along the West Coast between the Orange River and Cape Agulhas (SANBI 2018) of which approximately 75% are ‘Critically Endangered’ or ‘Endangered’, while 13% are considered ‘Vulnerable’.

Numerous smaller estuaries along the West Coast are intermittently, or seasonally open (Holgat, Buffels, Swartlintjies, Bitter, Spoeg, Groen, Brak, Sout and Jakkals Rivers).

9.2.2 Geology

The geology of the study area is complex with a diversity of metamorphic formations and sedimentary and igneous rock types. The most prominent and resistant are volcano-sedimentary metamorphites and gneisses of the mid-Protozoroic Namaqualand Metamorphic Complex and the limestones, dolomites and phylites of the Pan-African Gariep Supergroup (AEMCO, 2016).

The study area is underlain by unconsolidated and semi-consolidated sediments of Quaternary age. These sediments overlie meta-sediments of the Vanrhynsdorp Group, the metamorphic

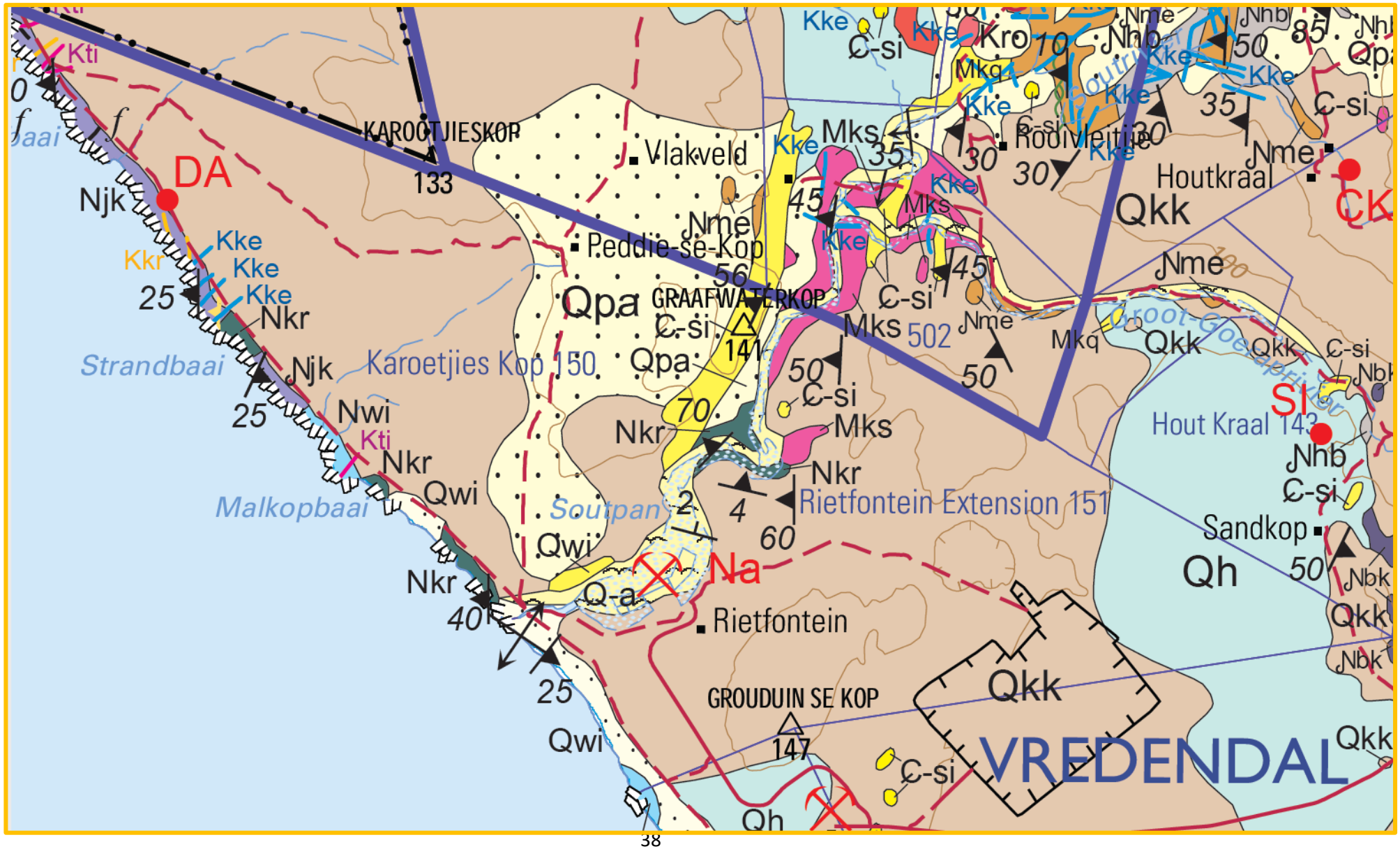
rocks of the Namaqualand Metamorphic Complex (NMC), as well as granites and dykes of the Koegel Fontein Complex (KFC) (Figure 7).
Unconsolidated and/or semi-consolidated sediments overlying the basement rock formations comprise:

- Dune deposits;
- Littoral (shoreline) deposits;
- Alluvial deposits (associated with the presence of preferential flow paths in the basement); and
- Wind transported deposits.

The sands decrease in age in a westward direction towards the coast. Prevailing soils are yellow-red-brown silty sands of Pleistocene origin, often overlain by a calcrete layer varying in depth and compaction. Windblown sands overly the calcrete layer and have a high sodium level due to the proximity to the sea and the presence of salt in the dew precipitates on the soil surface. These high sodium levels make the soil forms unsuitable for crop production, although the natural vegetation is well-adapted to high salinity levels. The unconsolidated nature of the sediment leads to high potential for erosion by runoff and wind.

Exploration of marine alluvial diamonds shows that there are preferential localities in which marine sedimentary deposits have higher probabilities of containing diamonds. These include gullies, potholes, and bedrock depressions, all of which are associated with marine wave-cut terraces. Such bedrock features are key concentration factors, and control all major aspects of sediment deposition in the marine environment. Diamonds are generally found close to the bedrock and are deposited in high-energy environment sediments containing pebbles, cobbles, and boulders. These sediments commonly owe their existence to storm beach deposits along the base lines of low cliffs that back wave-cut terraces. Also, it is upon these surfaces that diamondiferous gravels have been concentrated and redistributed northward by wave and current action during sea-level still stands. Due to numerous sea-level fluctuations, particularly in the Quaternary, multiple terrace development during sequential periods of transgression and regression has resulted in modification of existing terraces and the disruption of the depositional pattern of marine diamonds.

Figure 7: Geology of Prospecting area



Index to Figure 7 (Council for Geoscience 1:250 000 Geological series 3017 Garies)

LITHOLOGY

Q-a	Alluvium
Q-t	Quartz scree
Q-s	Heavy-mineral sand
Qwi	Shelly white sand
Qsd	Loamy brown sand
Qsw	Stabilised white to pale-red plume sand with remobilised plume sand ()
Qh	Pale-red to red dune sand
Qkk	Red aeolian sand
Qpa	Granitic soil with calcrete and dorbank, sometimes gypsiferous
N-si	Silcrete
Tgr	Semi-consolidated red sandy soil
Tdt	Silicified scree, sandstone and duricrust
Tsa	Carbonatite, glimmerite, explosion breccia
Tbf	Olivine melilitite and nephelinite plug
Kr	Alkali feldspar leucogranite
Kkr	Quartz porphyry dyke ( )
Kzr	Tholeiitic basalt plug
Kke	Microsyenite, quartz-microsyenite ( )
Kti	Basalt and alkali basalt dykes ( )
Krb	Aegerine syenite and/or fenite
Kro	Coarse alkali feldspar leucogranite
Ksa	Quartz-hornblende syenite, quartz-biotite syenite
Kf	Dolerite ( )
Nar	Arkose, grit, siltsone, vein quartz conglomerate, phyllite
Nat	White quartzite, graphitic phyllite, iron gossans
Nwi	Limestone and dolomitic marble
Nkr	Conglomerate, diamictite, quartzite, biotite schist
Nwp	Leucocratic glomeroporphyritic granite
Ngar	Mesocratic to leucocratic, equigranular to small porphyritic, schlieric granite
Nbk	Blue-grey megacrystic granite
Npa	Dark, equigranular and fine-grained biotite granite
Nklh	Grey-green, megacrystic granite
Nban	Leucocratic megacrystic granite
Nstf	Charnockitic, megacrystic, gneissic granite
Njk	Leucocratic, megacrystic granite to gneissic granite
Noo	Mafic granulite and amphibolite
Mk	See legend
Nan	Purple-weathering, charnockitic, coarse-grained and augen gneiss
Ndp	Red-weathering, mesocratic leucogneiss
Nsoe	Equigranular coarse- to medium-grained leucogneiss
Nkar	Equigranular coarse leucogranite
Nme	Pink augen gneiss, equigranular gneiss and leucogneiss
Nhu	Grey equigranular biotite and quartz-feldspar gneiss, augen gneiss

9.2.3 Land capability and Agricultural Potential

The soil and land types identified in the study area could all be classified as land with wilderness land capability. Even though some soil forms have the potential for arable agriculture, the very low rainfall of the study area makes it unsuitable for crop production. The study area could be suitable for grazing by small stock, but this may negatively affect biodiversity. The Remainder of the Farm Karoetjies Kop is currently leased from the mining company (Westcoast Resources) for grazing by small stock.

Table 7 indicates the set of criteria as stipulated by the guidelines outlined in Section 7 of The Chamber of Mines Handbook of Guidelines for Environmental Protection (Volume 3, 1981) to group soil forms into different land capability classes. Figure 8 show the Land Cover of the study area. Note that current land cover indicators do not consider degradation due to, for example, spread of alien plants, secondary impacts of mining (e.g., sand mobilization) or overgrazing by livestock.

Table 7: Pre-mining land capability criteria

Criteria for Wetland	• Land with organic soils; or • A horizon that is gleyed throughout more than 50 % of its volume and is significantly thick, occurring within 750mm of the surface.
Criteria for Arable Land	• Land which does not qualify as a wetland; • The soil is readily permeable to the roots of common cultivated plants to a depth of 750mm; • The soil has a pH value of between 4,0 and 8.4; • The soil has a low salinity and SAR; • The soil has a permeability of at least 1,5 mm per hour in the upper 500 mm of soil; • The soil has less than 10 % (by volume) rocks or pedocrete fragments larger than 100 mm in diameter in the upper 750 mm; • Has a slope (in %) and erodibility factor (K) such that their product is <2.0; and • Occurs under a climatic regime, which facilitates crop yields that are at least equal to the current national average for these crops or is currently being irrigated successfully.
Criteria for Grazing Land	• Land, which does not qualify as wetland or arable land; • Has soil, or soil-like material, permeable to roots of native plants, that is more than 250 mm thick and contains less than 50 % by volume of rocks or pedocrete fragments larger than 100 mm; and • Supports, or is capable of supporting, a stand of native or introduced grass species, or other forage plants, utilizable by domesticated livestock or game animals on a commercial basis.
Criteria for Wilderness Land	• Land, which does not qualify as wetland, arable land or grazing land.

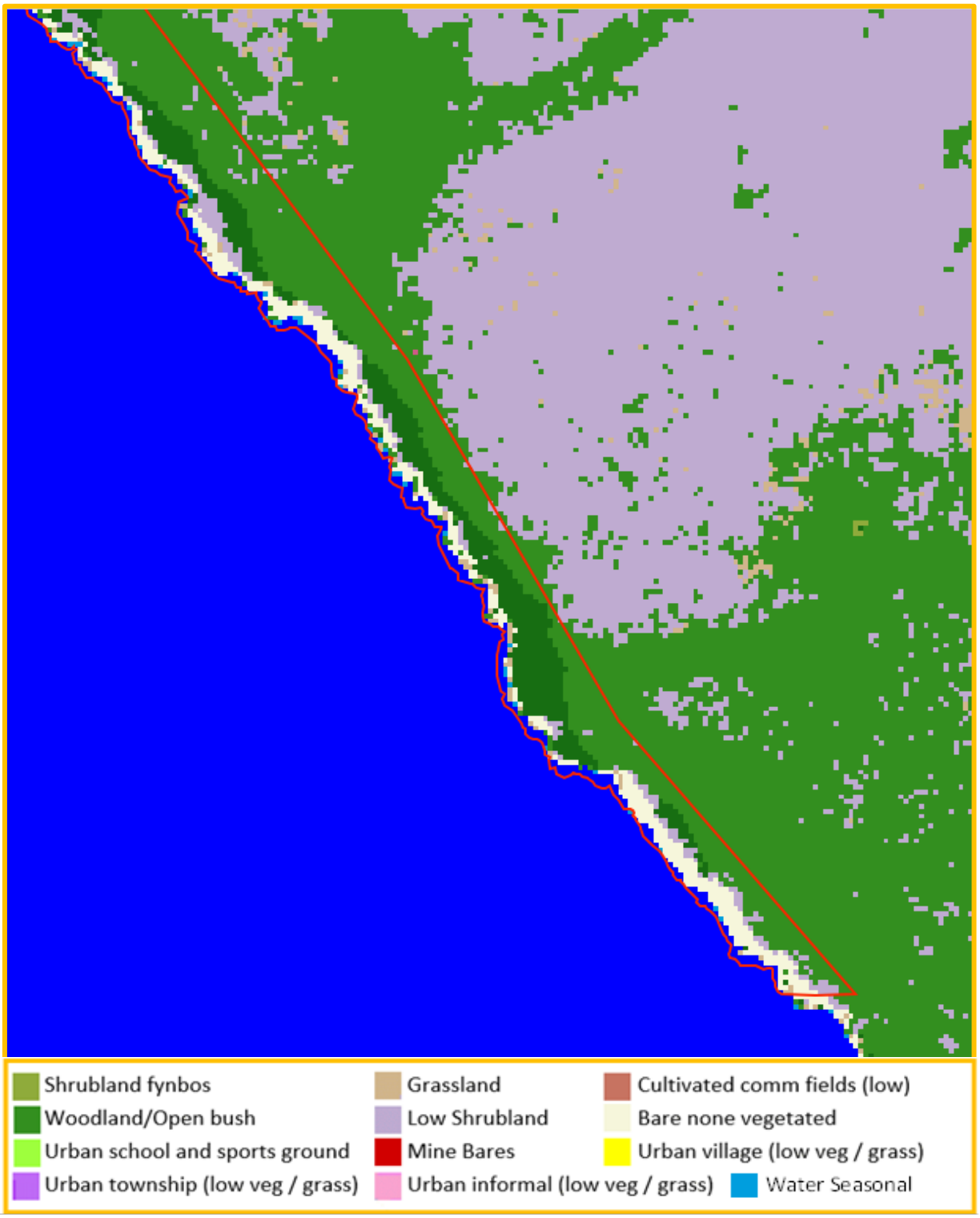
According to Ndeinoma (2006), the larger Namakwaland region is used for grazing, mining and in very small areas dry- and irrigated crop production. Ndeinoma (2006) indicates the grazing capacity of the area as 10 - 20 ha per Small Stock Unit.
This region is not suited to the production of arable agricultural products owing to the low rainfall. Consequently, there is no record of any form of agricultural production in the study area.

According to the DEA Sreening tool the sensitivity regarding Agriculture Theme, is regarded as low for more than 90%, with the remainder regarded as medium sensitivity and comprising of small patches cultivated dryland crop production (Refer Figure 9 and Table 8)
Note that ground-truthing during the site visit showed no evidence of historical or recent dryland or irrigated crop production in the study area. The areas indicated on the screening tool map is not dryland crop production rendering it a medium sensitivity and it is assumed that they result from desktop mapping. These patches are transformed areas due to historic mining activities or bare none vegetated areas along the coast.

As drylands crop production no longer takes place within the study area and the limited extend of invasive prospecting activities <5Ha the proposed prospecting activities will not have an impact on agricultural production. No Agro-Ecosystem Specialist Assessment is therefore required even when the areas to be disturbed by bulk sampling has been identified because the complete areas were identified as being of "Low" sensitivity for agricultural resources during the site visit.

Figure 8: Location of Prospecting area in terms of Land Cover sourced off SANB BGIS Map Viewer

South Section



North Section

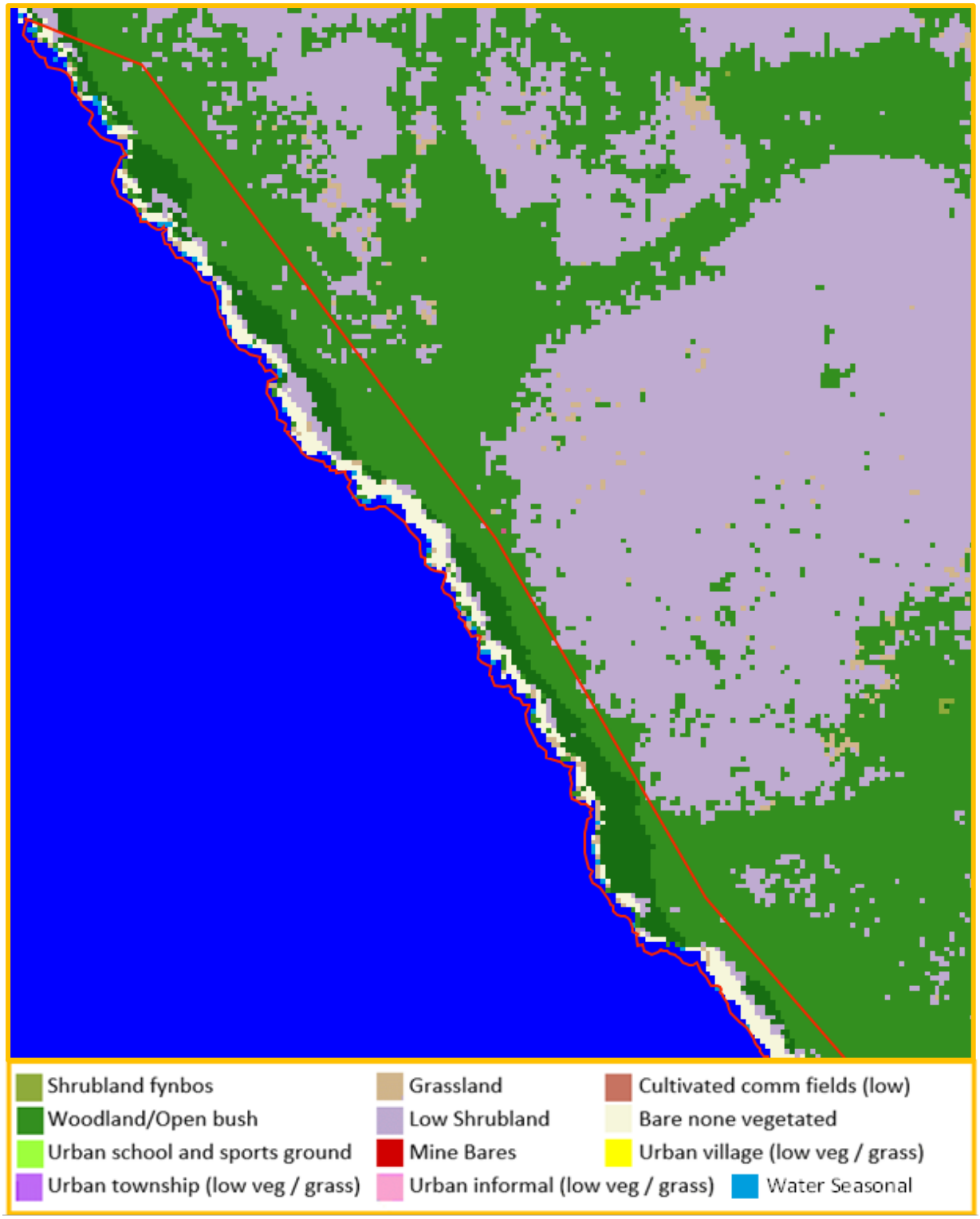
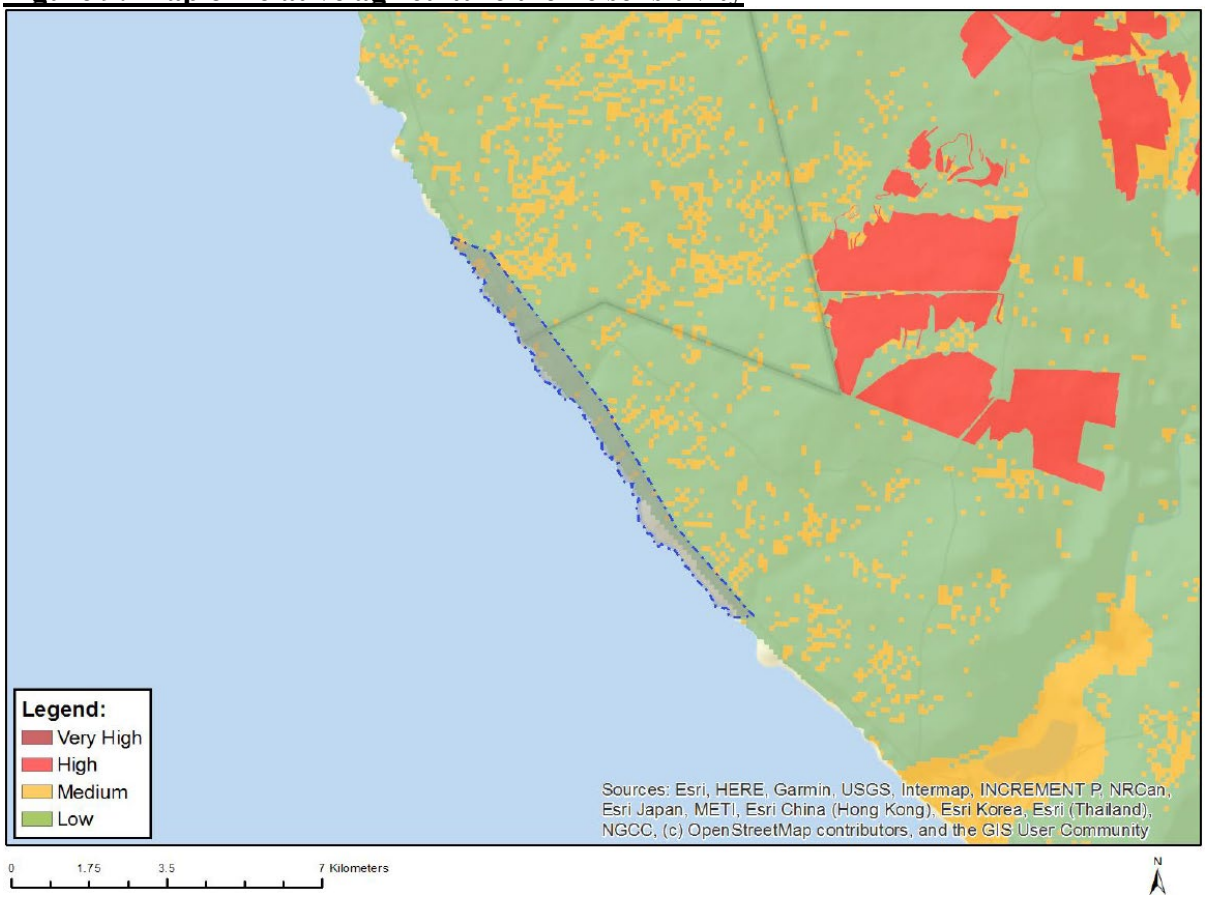


Table 8: Agriculture theme Sensitivity Features

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

Figure 9: Map of relative agriculture theme sensitivity



9.2.4 Wind Patterns

Winds are one of the main physical drivers of the nearshore Benguela region, both on an oceanic scale, generating the heavy and consistent south-westerly swells that impact this coast, and locally, contributing to the northward-flowing longshore currents, and being the prime mover of sediments in the terrestrial environment.

The strongest winds occur in summer (October to March), during which winds blow 98% of the time, and gales (winds exceeding 18 m/s or 35 kts) are frequent (CSIR 2006). Virtually all winds in summer come from the south to south-southeast, averaging 20 - 30 kts and reaching speeds in excess of 100 km/h (60 kts). The combination of these southerly/south-easterly winds drives the massive offshore movements of surface water, and the resultant strong upwelling of nutrient-rich bottom waters, which characterise this region in summer. Winter remains dominated by southerly to south-easterly winds, but the closer proximity of the winter cold-front systems results in a significant south-westerly to north-westerly component. This 'reversal' from the summer condition results in cessation of upwelling, movement of warmer mid-Atlantic water shorewards and breakdown of the strong thermoclines which typically develop in summer. There are also more calms in winter, occurring about 4% of the time, and wind speeds generally do not reach the maximum speeds of summer. However, the westerly winds blow in synchrony with the prevailing south-westerly swell direction, resulting in heavier swell conditions in winter.

During autumn and winter, catabatic, or easterly 'berg' winds can also occur. These powerful offshore winds can exceed 50 km/h, producing sandstorms that considerably reduce visibility at sea and on land. Although they occur intermittently for about a week at a time, they have a strong effect on the coastal temperatures, which often exceed 30°C during 'berg' wind periods (Shannon & O'Toole 1998).

9.2.5 Waves and Tides

Most of the west coast of southern Africa is classified as exposed, experiencing strong wave action, rating between 13-17 on the 20-point exposure scale (McLachlan 1980). Much of the coastline is therefore impacted by heavy south-westerly swells generated in the roaring forties, as well as significant sea waves generated locally by the prevailing moderate to strong southerly winds characteristic of the region. The peak wave energy periods fall in the range 9.7 – 15.5 seconds.

The wave regime along the southern African west coast shows only moderate seasonal variation in direction, with virtually all swells throughout the year coming from the S and SSW direction. Winter swells are strongly dominated by those from the S and SSW, which occur almost 80% of the time, and typically exceed 2 m in height, averaging about 3 m, and often attaining over 5 m. With wind speeds capable of reaching 100 km/h during heavy winter south-westerly storms, winter swell heights can exceed 10 m.

In comparison, summer swells tend to be smaller on average, typically around 2 m, not reaching the maximum swell heights of winter. There is also a slightly more pronounced southerly swell component in summer. These southerly swells tend to be wind-induced, with shorter wave periods (~8 seconds), and are generally steeper than swell waves (CSIR 1996). These wind-induced southerly waves are relatively local and, although less powerful, tend to work together with the strong southerly winds of summer to cause the northward-flowing nearshore surface currents, and result in substantial nearshore sediment mobilisation, and northwards transport, by the combined action of currents, wind, and waves.

In common with the rest of the southern African coast, tides are semi-diurnal, with a total range of some 1.5 m at spring tide, but only 0.6 m during neap tide periods.

9.2.6 Turbidity

Turbidity is a measure of the degree to which the water loses its transparency due to the presence of suspended particulate matter. Total Suspended Particulate Matter (TSPM) can be divided into Particulate Organic Matter (POM) and Particulate Inorganic Matter (PIM), the ratios between them varying considerably. The POM usually consists of detritus, bacteria, phytoplankton and zooplankton, and serves as a source of food for filter-feeders. PIM, on the other hand, is primarily of geological origin consisting of fine sands, silts and clays. Off Namaqualand, the PIM loading in nearshore waters is strongly related to natural inputs from the Orange and Olifants Rivers or from 'berg' wind events. Although highly variable, annual discharge rates of sediments by the Orange River is estimated to vary from 8 - 26 million tons/yr (Rogers 1979). 'Berg' wind events can potentially contribute the same order of magnitude of sediment input as the annual estimated input of sediment by the Orange River (Shannon & Anderson 1982; Zoutendyk 1992, 1995; Shannon & O'Toole 1998; Lane & Carter 1999). For example, a 'berg' wind event in May 1979 described by Shannon and Anderson (1982) was estimated to have transported in the order of 50 million tons of sand out to sea, affecting an area of 20,000 km². Although the Berg River and Olifants River (two of only three permanently open river systems on the West Coast) enter the West Coast, annual sediment yields are low due to thin soils and the resistant nature of Table Mountain Sandstones (Clark & Ractliffe 2007). PIM loading in the surf zone of Concession 11A would therefore typically be negligible.

The major source of turbidity in the swell-influenced nearshore areas off the West Coast is the redistribution of fine inner shelf sediments by long-period Southern Ocean swells. The current velocities typical of the Benguela (10-30 cm/s) are capable of resuspending and transporting considerable quantities of sediment equatorwards.

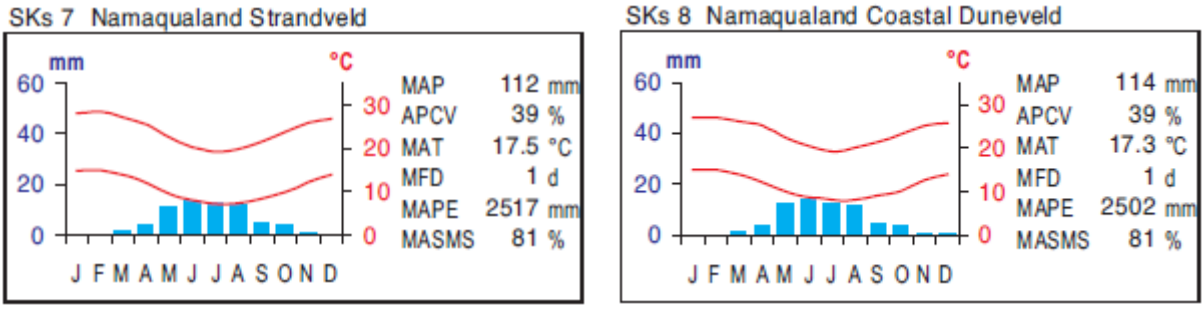
Under relatively calm wind conditions, however, much of the suspended fraction (silt and clay) that remains in suspension for longer periods becomes entrained in the slow poleward

undercurrent (Shillington et al. 1990; Rogers & Bremner 1991).
Superimposed on the suspended fine fraction, is the northward littoral drift of coarser bedload sediments, parallel to the coastline. This northward, nearshore transport is generated by the predominantly south-westerly swell and wind-induced waves. Longshore sediment transport varies considerably in the shore-perpendicular dimension, being substantially higher in the surf-zone than at depth, due to high turbulence and convective flows associated with breaking waves, which suspend and mobilise sediment (Smith & Mocke 2002).
Although natural turbidity of seawater is a global phenomenon, there has been a worldwide increase of water turbidity and sediment load in coastal areas because of anthropogenic activities.

9.3 Climate

Karoetjies Kop is in an arid environment with average temperatures of c.16 °C. In the coldest months of the year (May to August) temperatures below 10°C are often recorded. The highest temperatures are reached from December to January (may well exceed 30°C). The maximum recorded temperature was 42.5°C in March 2017 and the minimum temperature was 4.6°C recorded in July 2016 (Council for Scientific and Industrial Research meteorological station at Brand se Baai, 2011 – 2018 data). The site and its surrounds experience hot dry summers and very low rainfall winters. The area receives rain throughout the year, with most of it occurring between the months of May and August (Figure 10). The mean annual rainfall from 1993 to 2018 was c.140 mm/a, although it is evident that the years since 2013 have been dominated by dry weather patterns which caused the drought experienced in the region.
One of the major contributors to precipitation in the area is fog, which contributes up to 252.9 mm/a over 100 days of the year (Anglo American Corporation, 1990).
According to Mucina and Rutherford 2006, winter-rainfall climate with irregular rain events occurring mostly from May to August and almost always no rain between November and February. MAP of 115 mm. Dew is experienced throughout the winter and frosts hardly occur.

Figure 10: Climate diagram (Mucina and Rutherford 2006)



9.4 Emissions

This section is based on desktop information sourced from Air Quality Impact Assessments completed for strip mining operations adjacent to the study area mainly Airshed, 2018.

9.4.1 Air Quality

Criteria pollutants are considered those pollutants most commonly found in the atmosphere, that have proven detrimental health effects when inhaled and are regulated by ambient air quality criteria. These generally include carbon monoxide (CO), nitrogen dioxide (NO2), sulphur dioxide (SO2), Particulate Matter (PM) and ground level ozone (O3).
In determining ambient air quality, concentrations of pollutants are measured and/or modelled and compared against air quality standards.

These standards are intended to protect human health and environmental degradation and, as such, focus on emissions perceived to pose a health or environmental risk.
The National Ambient Air Quality Standards (NAAQS) and additional standards for particulate matter less than 2.5 µm in aerodynamic diameter (PM2.5) are provided in Table 9. These standards are based on international best practices and aim to protect human health and indicate safe exposure levels for most of the population throughout an individual's lifetime, including the very young and the elderly.

Table 9: National Ambient Air Quality Standards

Pollutant	Averaging Period	Concentration (µg/m³)	Permitted Frequency of Exceedance	Compliance Date
SO_2	10 minutes	500	526	Immediate
	1 hour	350	88	Immediate
	24 hour	125	4	Immediate
	1 year	50	0	Immediate
Benzene	1 year	5	0	1 January 2015
CO	1 hour	30000	88	Immediate
	8 hour(a)	10000	11	Immediate
Lead	1 year	0.5	0	Immediate
NO_2	1 hour	200	88	Immediate
	1 year	40	0	Immediate
O_3	8 hour(b)	120	11	Immediate
$PM_{2.5}$	24 hour	40	4	1 January 2016 till 31 December 2029
	24 hour	25	4	1 January 2030
	1 year	20	0	1 January 2016 till 31 December 2029
	1 year	15	0	1 January 2030
PM_{10}	24 hour	75	4	1 January 2015
	1 year	40	0	1 January 2015

The National Dust Control Regulations (NDCR) prescribe general measures for the control of dust. The standard for acceptable dustfall rates is set out in Section 12.4.1 for residential and non-residential areas. According to these regulations, the dustfall that originates from this project cannot exceed 1 200 mg/m²/day beyond the boundary of the study area considering the permitted frequency of exceeding dust fall rate of two within a year, not sequential months. In addition to the dust fall limits, the NDCR prescribe monitoring procedures and reporting requirements.
The air quality of the study area is mostly influenced by activities at the Tronox Namakwa Sands' MSP and current Tormin mining operations, farming activities, domestic fires, vehicle exhaust emissions and dust entrained by vehicles. These emission sources vary from activities that generate relatively coarse airborne particulates (such as farmland preparation, dust from paved and unpaved roads and the Tormin Mine) to fine particulate matter (PM) such as that emitted by vehicle exhausts, diesel power generators and dryers. Other sources of PM include occasional fires in the residential areas of Koekenaap, Lutzville, Vredendal and farm activities. Emissions from unpaved roads constitute a major source of emissions to the atmosphere in South Africa. Dust emissions from unpaved roads are a function of vehicle traffic and the silt loading on the roads. Emissions generated by wind erosion are dependent on the frequency of disturbance of the erodible surface.

Prospecting activities will take place in a very remote area and dust generation will be limited to a small radius around the operation and no sensitive receptors was identified. The impact of dustfall from this small prospecting operation is regarded as insignificant in relation to the large-scale strip-mining operation, where specialist studies concluded the simulated 24-hour average dustfall rates do not exceed the NDCR non-residential limit of 600 mg/m²-day

9.4.2 Noise

The site is surrounded by farmland with typical, low noise levels. Along the coast, noise generated by wave action is likely to result in higher-than-normal ambient noise levels, especially during rough sea conditions. Traffic-generated noise in the area is low (estimate at ±55dBA). Noise from earth moving equipment and machinery associated with the prospecting operation will be within the norm and due to the remote locality of the operation will have no impact. There are very few noise receptors in the area with the nearest receptors more than 1Km including existing mines that generate much higher noise levels.

Typical noise levels generated by various types of construction equipment are listed in the table below.

Equipment	Typical operational Noise level at given offset (dBA)							
	5m	10m	25m	50m	100m	250m	500m	1000m
Air compressor	91	85	77	71	65	57	51	46
Crane (mobile)	93	87	79	73	67	59	53	47
Dozer	95	89	81	75	69	61	55	49
Pump	86	80	72	66	60	52	46	40
Rock Drill	108	102	94	88	82	74	68	62
Trucks	87	81	73	67	64	60	57	54

In South Africa, the noise impact on human receptors is evaluated in terms of the SANS 10103 guidelines for sound pressure levels as listed in the table below.

Type of District	Equivalent continuous rating level for ambient noise - dBA					
	Outdoors			Indoors with windows open		
	Day-night	Daytime	Night	Day-	Daytime	Night-
Rural districts	45	45	35	35	35	25
Suburban district	50	50	40	40	40	30
Urban traffic	55	55	45	45	45	35
Urban districts	60	60	50	50	50	40
Central business district	65	65	55	55	55	45
Industrial district	70	70	60	60	60	50

Daytime and night-time refer to the hours from 06h00 to 22h00 and 22h00 to 06h00 Respectively

9.5 Biodiversity, Flora, and Fauna

9.5.1 Fauna

The relative abundance of the larger mammals is dominated by Steenbok, Common Duiker and Cape Porcupine with Cape Fox and African Wild Cat the most common predators. Several studies done for large scale mining and renewable energy projects has shown there is no significant difference between the mammalian community structure in the study area and the broader area and the range of habitats is similar. The beaches appear to be important for several predators such as African Wild Cat and Black-backed Jackal which regularly visit the beaches to look for carrion.

The Cape fur seal is a resident along the west coast of Africa, occurring at numerous breeding and non-breeding sites on the mainland and on nearshore islands and reefs. The South African population, which includes the West Coast colonies, was estimated at ca. 725,000 individuals

in 2020. This is about 40% of the total southern African population, which has previously been estimated at up to 2 million (Seakamela et al. 2022)

There are several Cape fur seal breeding colonies within the broader study area: at Bucchu Twins near Alexander Bay, at Cliff Point (~17 km north of Port Nolloth), at Kleinzee (incorporating Robeiland), Strandfontein Point (south of Hondeklipbaai), Elephant Rocks, Paternoster Rocks and Jacobs Reef at Cape Columbine. The closest breeding colony to the study area is at Elephant Rocks ±40Km to the south. They are therefore highly likely to be encountered during sampling activities as Seals are highly mobile animals with a general foraging area covering the continental shelf up to 120 nautical miles offshore (Shaughnessy 1979), with bulls ranging further out to sea than females.

According to the South African Reptile Conservation Assessment database and du Preez and Carruthers (2009), the study area falls within the distribution range of at least 58 reptiles, comprising 5 chelonians, 23 snakes, 24 lizards and skinks, 12 geckos and 1 chameleon. Several West Coast endemics are present within the development footprint but only the Speckled padloper (Chersobius signatus) is listed as SCC as part of the DEA Screening tool and is regarded as Vulnerable in terms of TOPS 2015 list. The Namaqua Sand Frog is common along the west coast as it is independent of surface water.

The presence of the Avifaunal SCC is the only criteria rendering the study area with a high sensitivity regarding relative Animal Species theme. Approximately 188 terrestrial and coastal bird species have been recorded in the study area and surrounds (including the Olifants River Estuary), based on data obtained from the Southern African Bird Atlas Project. Of this total, 19 species (10%) are considered endemic and 30 (16%) near-endemic to South Africa (Taylor et al., 2015), while 12 species (6%) are listed as Threatened and six (3%) as Near Threatened. The landscape of the study area represents two primary avifaunal habitats, the interior sandy plains, and the coastal shore. The interior plains of the study area support mostly small passerines (~ 52 species, 65%). While none of these passerines are red listed, 14 species are endemic and 19 near-endemic to South Africa (Taylor et al., 2015).

Non-passerines make up a third (35%) of all shrubland species, with the following of particular importance (with red list status): the Endangered Black Harrier *Circus maurus*, the Vulnerable Southern Black Korhaan *Afrotis afra*, and Secretarybird *Sagittarius serpentarius*, and the Near Threatened Kori Bustard *Ardeotis kori*. No sensitive or unique areas with respect to foraging, breeding or roosting were identified within the study area, although most of the above red listed species utilise the habitat to varying degrees. There are no terrestrial Important Bird Areas (IBAs), Coordinated Avifaunal Roadcount routes (CAR) or Coordinated Waterbird Count sites (CWAC) near the study area. The nearest IBA is the Olifants River Estuary approximately 43 km south, which is also a registered CWAC site.

Approximately 35 bird species are almost exclusively associated with the coastal shore, including cormorants, gulls, terns, oystercatcher, and resident and migratory shorebirds. These are all non-passerine species with a very low incidence of endemism, yet a relatively high number are red listed (9 species, 25%). The most commonly encountered SCC throughout the year include the Endangered Cape Cormorant *Phalacrocorax capensis* and African Black Oystercatcher *Haematopus moquini*. The latter is no longer red listed as numbers have increased by 37% since 1980, while its population has experienced an eastward range expansion (Taylor et al., 2015).

There are no known breeding colonies for any of the three cormorant species near the study area (Taylor et al., 2015). The closest breeding islands to the study area are Bird Island in Lambert's Bay approximately 48 km to the south of the study area.

Regarding the sandy beaches where sampling will be concentrated during this project, the coastal biological communities consist of many hundreds of species, often displaying considerable temporal and spatial variability (even at small scales). No rare or endangered species have been recorded (Awad et al. 2002). The biological communities 'typical' of the surf zone habitats are described briefly below, focusing both on dominant, conspicuous species, as well as potentially threatened or sensitive species, which may be affected by the proposed prospecting activities.

In the southern Benguela, a rich outer turbulent zone (10-33 m from the shore) supports cnidarians (anemones), tube building polychaetes and amphipods; while the less diverse offshore turbulent zone (3-5 m from the shore) is typified by deep burrowing polychaetes and crustaceans. Poor species diversity and abundance, as well as the presence of cumaceans, characterise the inner turbulent part of the surf zone (0-1 m from the shore).

Fish such as galjoen (Dichistius capensis) and white steenbras (Lithognathus lithognathus) frequent turbulent surf zone waters off the West Coast where they swim over submerged beaches at high tide and feed on small crustaceans (Branch 1981). Surf zone habitats, particularly medium to low energy beaches, are in fact widely recognised as important nursery areas for fish (Lenanton et al. 1982; Clark et al. 1996).

The abalone, an important commercial species present in kelp beds south of Cape Columbine is naturally absent north of Cape Columbine. Key predators in the sub-littoral include the commercially important West Coast rock lobster and the octopus. The rock lobster acts as a keystone species as it influences community structure via predation on a wide range of benthic organisms (Mayfield et al. 2000).

Intertidal Sandy Beaches (Figure 11)

The composition of their faunal communities is largely dependent on the interaction of wave energy, beach slope and sand particle size, which is termed beach morphodynamics. Dissipative beaches usually harbour the richest intertidal faunal communities and intermediate beach conditions have a very variable species composition (McLachlan et al. 1993; Jaramillo et al. 1995, Soares 2003). This variability is mainly attributable to the amount and quality of food available. Beaches with a high input of e.g., kelp wrack have a rich and diverse drift-line fauna, which is sparse or absent on beaches lacking a drift-line (Branch & Griffiths 1988). Beaches act as filters and energy recyclers in the nearshore environment (Brown & McLachlan 2002).

The upper beach dry zone (supralittoral) is situated above the high-water spring (HWS) tide level, and receives water input only from large waves at spring high tides or through sea spray. This zone is characterised by a mixture of air breathing terrestrial and semi-terrestrial fauna, often associated with, and feeding on kelp deposited near or on the driftline.

The mid-beach retention zone and low-beach saturation zone (intertidal zone or mid-littoral zone) has a vertical range of about 2 m. This mid-shore region is characterised by the cirolanid isopods, and amphipods of the families Haustoridae and Phoxocephalidae. In some areas, juvenile and adult sand mussels may also be present in considerable numbers.

The surf zone extends from the Low Water Spring mark to about 2m depth. A variety of polychaetes are typical of this zone, although they generally extend partially into the midlittoral above. In areas where a suitable swash climate exists, the gastropod Bullia digitalis may also be present in considerable numbers, surfing up and down the beach in search of carrion. The transition zone spans approximately 2 - 5 m depth beyond the inner turbulent zone. Extreme turbulence is experienced in this zone, and therefore this zone typically harbours the lowest diversity on sandy beaches. The outer turbulent zone extends beyond the surf zone and below 5 m depth, where turbulence is significantly decreased and species diversity is again much higher.

Intertidal Rocky Shores (Figure 12)

Several studies on the west coast of southern Africa have documented the important effects of wave action on the intertidal rocky-shore community. Specifically, wave action enhances filter-feeders by increasing the concentration and turnover of particulate food, leading to an elevation of overall biomass despite low species diversity (McQuaid & Branch 1985; Bustamante & Branch 1995, 1996a; Bustamante et al. 1997). Conversely, sheltered shores are diverse with a relatively low biomass, and only in relatively sheltered embayments does drift kelp accumulate and provide a vital support for very high densities of kelp trapping limpets, that occur exclusively there (Bustamante et al. 1995). In the subtidal, these differences diminish as wave exposure is moderated with depth.

West Coast rocky intertidal shores can be divided into five zones based on their characteristic biological communities: The Littorina, Upper Balanoid, Lower Balanoid, Cochlear/Argenvillei and the Infratidal Zones. These biological zones correspond roughly to zones based on tidal heights (Figure 12). Tolerance to the physical stresses associated with life on the intertidal, as well as biological interactions such as herbivory, competition and predation interact to produce these five zones.

The uppermost part of the shore is the littoral fringe, which is the part of the shore that is most exposed to air, perhaps having more in common with the terrestrial environment and characterised by low species diversity. From the Lower Balanoid zone, biological communities are determined by exposure to wave action.

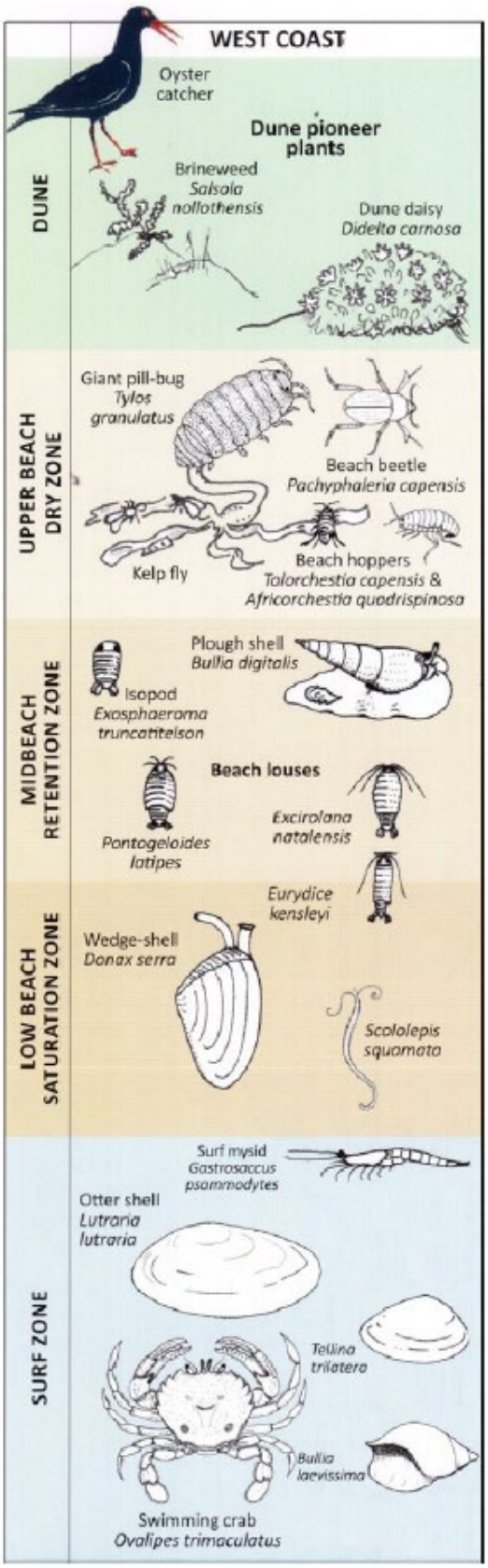


Figure 11: Schematic representation of the West Coast intertidal beach zonation
(Adapted from Branch & Branch 2018).

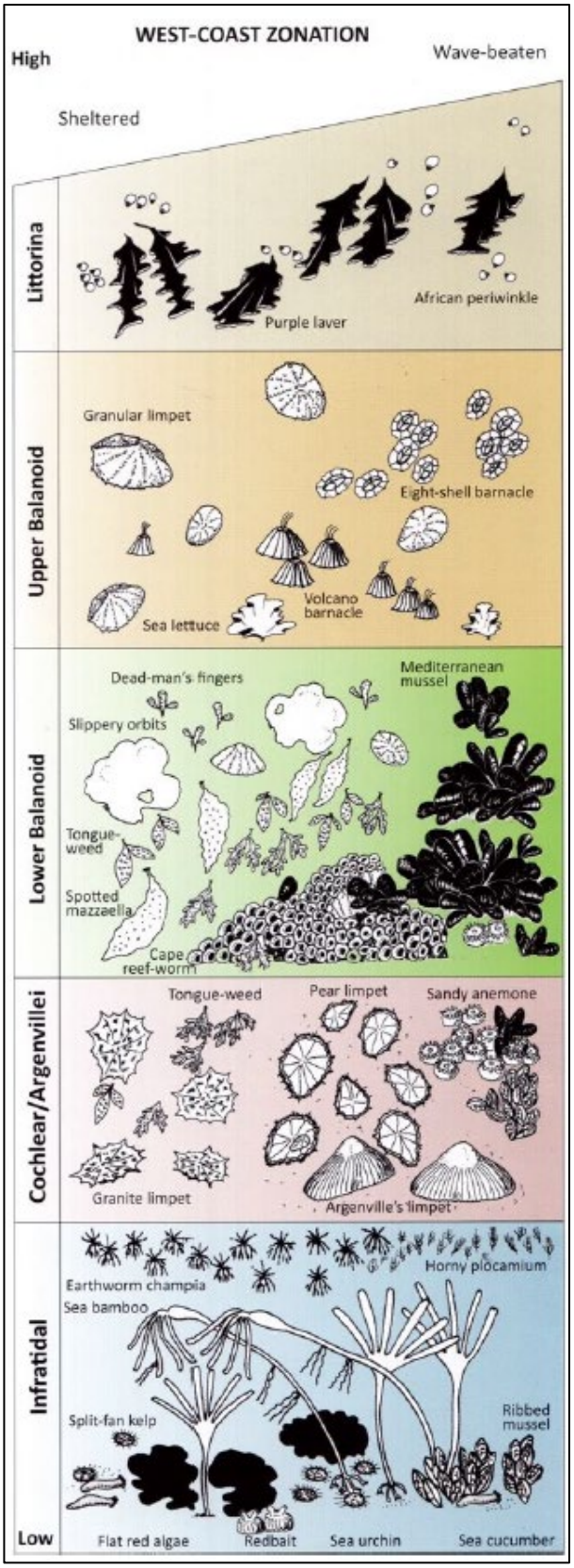


Figure 12: Schematic representation of the West Coast intertidal rocky shore zonation

Several specialist studies complete for the largescale mining and renewable energy projects in and around the study area has shown there is no discernible difference in mammalian community structure and composition inside and outside of the development areas. The resident mammalian fauna appears to be tolerant of mining activities and did not avoid the mining areas to a significant degree. Consequently, the major impact on fauna from the current development is likely to be the temporary loss of less than 5 Ha coastal habitat, which is of local but not broader significance. As with mammals, impacts on reptiles and amphibians are likely to be restricted largely to habitat loss equivalent to the development footprint.

As sandy beaches are highly dynamic, these habitats are less sensitive to disturbance than rocky shore environments. Sandy beaches are also quicker to recover from disturbance than rocky habitats, with recovery from intensive mining operations being found to occur within two to three years in Namibia (Pulfrich and Branch 2014). Relatively few species occur on sandy beaches in comparison to rocky shores due to the unstable and harsh nature of beaches. Those species that do occur on sandy beaches are hardy and well adapted to life in these environments (Branch 1981).

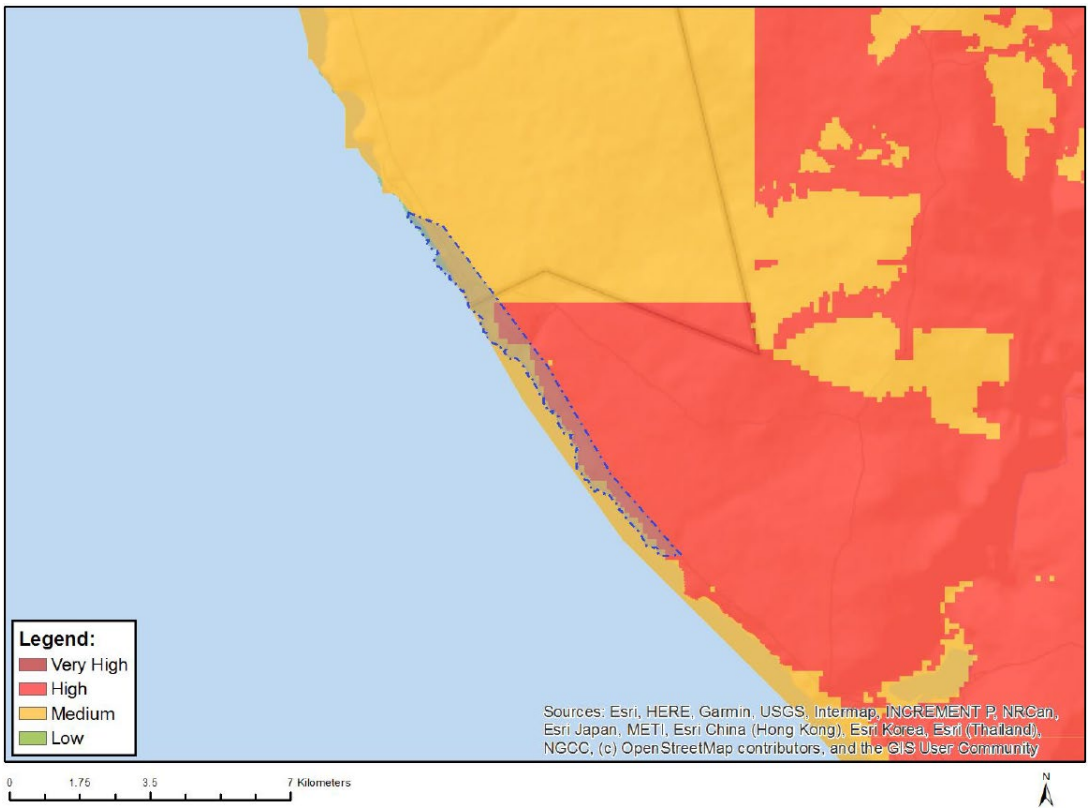
Sampling activities will have a medium significant impact on these species due to the small areas to be disturbed and short duration of activities. Mitigation of the disturbance is also possible and after mitigation the impact will be regarded as low significance. It must also be noted that less than 5 Ha mainly sandy beaches will temporary be disturbed by sampling.

According to the screening report (DEA) the prospecting area is regarded as high sensitivity regarding Animal Species (Refer Table 10 and Figure 13)

Table 10: Animal Species theme Sensitivity Features

Sensitivity	Feature(s)
High	Aves-Afrotis afra
Low	Subject to confirmation
Medium	Aves-Afrotis afra
Medium	Aves-Circus maurus
Medium	Sensitive species 32
Medium	Invertebrate-Brinckiella mauerbergerorum

Figure 13: Map of relative Animal Species theme sensitivity



9.5.2 Flora

According to the national vegetation map (Mucina and Rutherford 2006 and 2012 update), there are only two vegetation types within the development footprint – Namaqualand Seashore Vegetation along the seashore and Namaqualand Strandveld inland both these units are regarded as least threatened.

This is however a very coarse depiction of the vegetation of the area and Skowno et al. (2009) provide a more realistic and detailed mapping of the vegetation of the area as part of a conservation assessment of the West Coast District Municipality (Figure 14). The mapping by Skowno et al. (2009) recognised the following types of vegetation in the study area:

- Cape Seashore Vegetation;
- Namaqualand Coastal Duneveld;
- Namaqualand Inland Duneveld
- Namaqualand Strandveld
- Namaqualand Heuweltjie Strandveld; and
- Nam Seashore Vegetation

Not all these vegetation types are officially recognised vegetation types in the national vegetation map, but were defined by Skowno et al. (2009). Namaqualand Heuweltjie Strandveld (Skowno et al. 2009) represents the ecotone vegetation between the Namaqualand Strandveld and Namaqualand Heuweltjieveld of Mucina and Rutherford (2006). The main driver here is soil texture, with typical Namaqualand Strandveld on sandy soils and the Namaqualand Heuweltjie Strandveld of Skowno et al. associated with more compact, fine-textured soils.

Although the vegetation along the shore is classified in the National Vegetation Map as Namaqualand Seashore Vegetation as is still the case for the Namaqualand district, Skowno et al. define this vegetation as Cape Seashore Vegetation in the West Coast District. Namaqualand (Cape) Seashore Vegetation occurs along a very narrow strip above the high tide zone of the west coast from the Holgat River to just south of the Olifants River (Mucina and Rutherford 2006). This vegetation type occurs on slightly sloping beach, coastal rocky formations supporting sparse vegetation composed partly of succulent hummock-forming and spreading dwarf shrubs and herbs on the beach, in shell beds and on low dunes. The soils associated with this vegetation type are typically recent sandy marine sediments. The vegetation is under constant maritime influence from salt spray but is not directly influenced by sea tides. Mucina and Rutherford (2006) list mining as the greatest threat to this vegetation type.

The Namaqualand Strandveld which incorporates the areas mapped as Namaqualand Heuweltjie Strandveld by Skowno et al. occurs on the coastal peneplain, associated with deep stabilised aeolian yellowish-red dunes and deep sand overlying marine sediments and granite gneisses. The vegetation consists of low species-rich shrubland dominated by erect and creeping succulent shrubs as well as non-succulent shrubs (Mucina and Rutherford 2006).

According to Mucina and Rutherford (2006), Namaqualand Inland (Coastal) Duneveld is distributed in the Northern Cape Province where it occurs in two patches: one between Kotzesrus northwards to the Groen River and the other between Wallekraal and Hondeklipbaai. However, as the vegetation mapping of Skowno et al. suggest, this unit has been under-mapped and it is more extensive than previously mapped. The vegetation occurs on coastal peneplains with mobile dunes and consists of tall shrubland dominated by non-succulent shrubs as well as some grasses and restioids.

Figure 14: Vegetation

The screening report only identify 9 SCC (Table 11) none of which are listed species and legally protected in terms of the listed threatened or protected species (TOPS) regulations in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). Most of the SCC listed is regarded as Vulnerable according to the IUCN Red List with only *Oncosiphon schlechteri* regarded as Endangered according to the IUCN Red List.

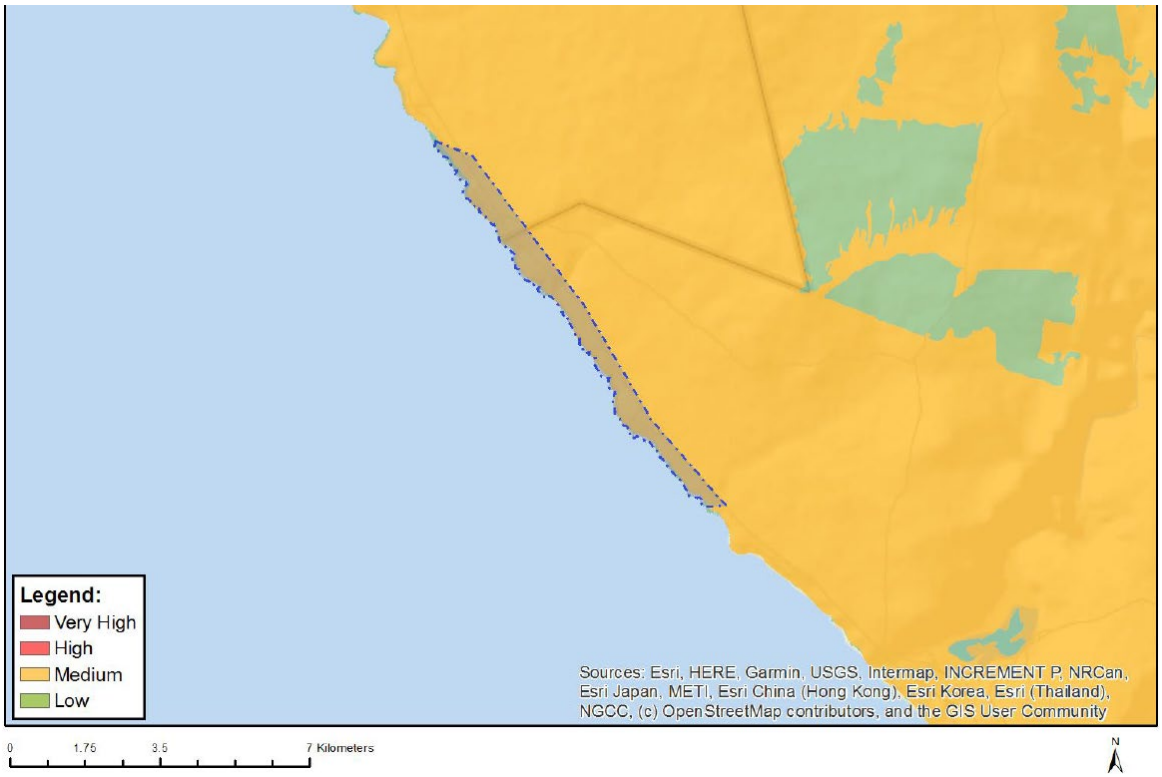
Although there are some listed species present in this study area, the overall abundance of such species within the site is low and a high impact on listed plant species is not likely as work above the high-water mark will concentrate around transformed areas. Studies has shown that the study area is fairly homogenous and similar habitat is broadly available in the area. Less than 5Ha will temporary be disturbed by sampling and will mainly cover the area below the high-water mark and transformed areas. The project will have a medium significant impact regarding Flora due to the small areas to be disturbed and short duration of activities. Mitigation of the disturbance is also possible and after mitigation the impact will be regarded as low significance. Due to the relatively low vegetation cover of the Seashore vegetation and the high winds along the coast, they are considered vulnerable to disturbance and easily mobilised. Increased sand movement due to disturbance caused by access roads as well as increased sand input from the beaches due to beach mining activities would potentially affect this community and monitoring of the stability of these areas especially along the access roads to the beaches will be a priority.

According to the screening report (DEA) the prospecting area is regarded as medium sensitivity regarding Plant Species (Refer Table 11 and Figure 15). The SSVR agree with this sensitivity rating.

Table 11: Plant Species theme Sensitivity Features

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Manulea cinerea
Medium	Tetragonia pillansii
Medium	Leucoptera nodosa
Medium	Oncosiphon schlechteri
Medium	Sensitive species 1156
Medium	Argyrolobium velutinum
Medium	Aspalathus obtusata
Medium	Helichrysum dunense
Medium	Muraltia obovata

Figure 15: Map of relative Plant Species theme sensitivity



9.5.3 Biodiversity

The study area includes portions of the Namaqualand Strandveld and Namaqualand Seashore Vegetation both regarded as least threatened (Figure 14).

According to the National Protected Areas Expansion Strategy (NPAES) Department of Environment Affairs (DEA) 2009 the area is not included in the NPAES with the closest focus area the Knersvlakte Nature Reserve ±55Km from the project site. No protected areas are located within a 10Km radius of the mining area with Elephant Rock Island Reserve ("Robeiland"), located more than 10km south of the study area the nearest declared protected area managed by CapeNature.

Regarding sensitive terrestrial ecosystems According to the Western Cape Biodiversity Spatial Plan 2017 most of the area classified as Critical Biodiversity Area (CBA) with small sections classified as Ecological Support Areas (ESA1 and ESA2) (Figure 18 and 19).

The surf zone included in this application form part of the Southern Benguela Ecoregion. The coastline of the study area is characterised by Sandy Shores (S- Shores), Rocky Shores (R-Shores) Mixed Shores, and Estuaries (Figure 17). These were categorised into ecosystem types by Sink et al. (2019) and assigned a threat status depending on their geographic extent and extent of ecosystem degradation.

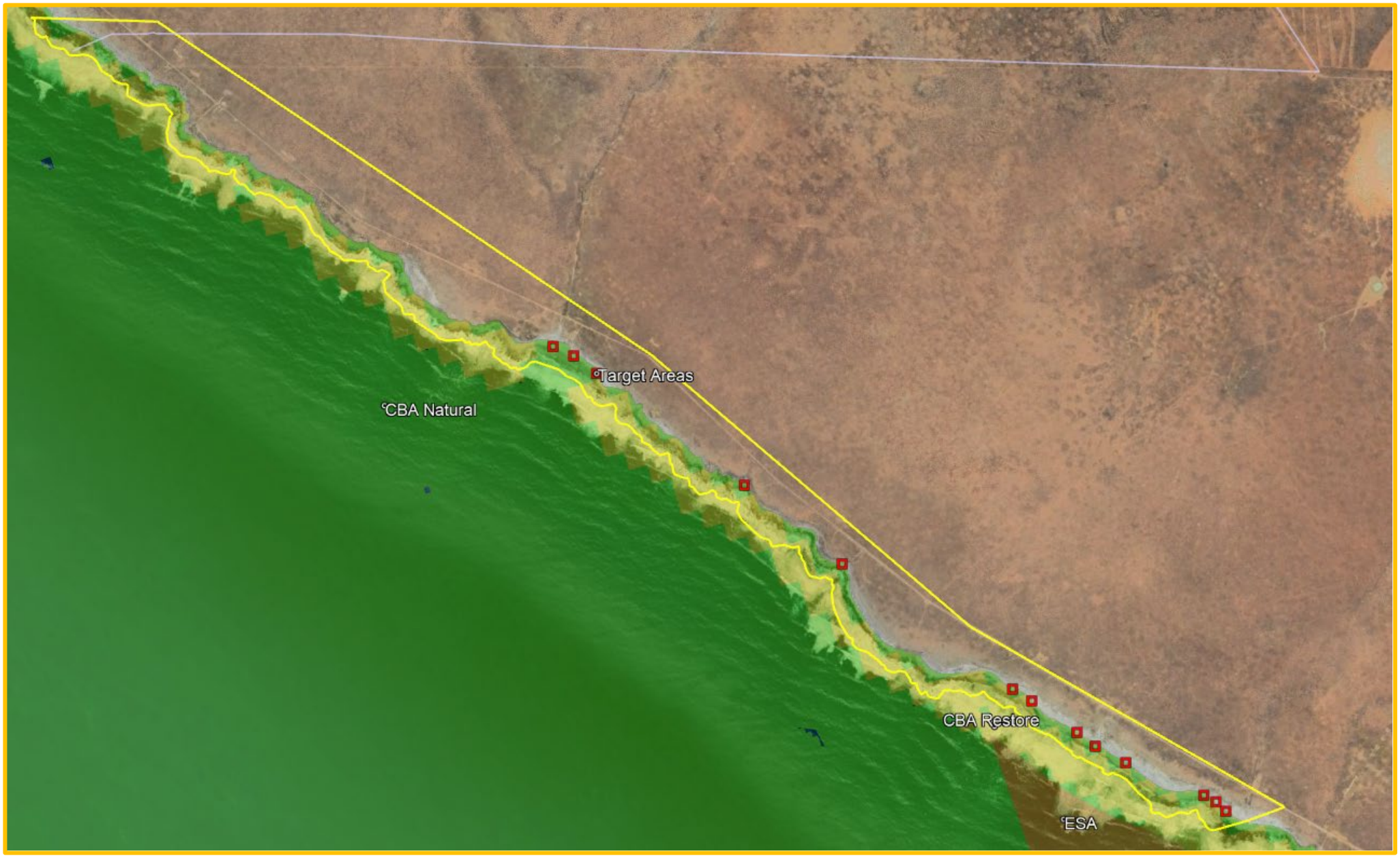
Much of the project area has been categorised as Mixed Shore with a threat status of 'vulnerable.' Due to the exposed nature of the coastline in the study area, the two beaches are categorised as Intermediate Sandy Shore with a threat status of 'Near Threatened' reflecting the condition of the ecosystem types following decades of shore- and vessel-based diamond mining. No reflective sandy beaches or estuaries regarded as endangered habitat types are present in the study area. The National Coastal and Marine Spatial Biodiversity Plan comprises a map of Critical Biodiversity Areas (CBAs), Ecological Support Area (ESAs). The study area overlaps with areas mapped as Critical Biodiversity Areas Natural and Critical Biodiversity Areas Restored (Figure 19).

Figure 16: Project footprint (yellow polygon) in relation to Sensitive Terrestrial Ecosystems also indicating target areas

Figure 17: Project footprint (yellow polygon) in relation to Sensitive Coastal Ecosystems also indicating target areas

Figure 18: Project footprint (yellow polygon) in relation to Critical Terrestrial and Aquatic Biodiversity Areas

Figure 19: Project footprint (yellow polygon) in relation to Critical Marine and Coastal Biodiversity Areas

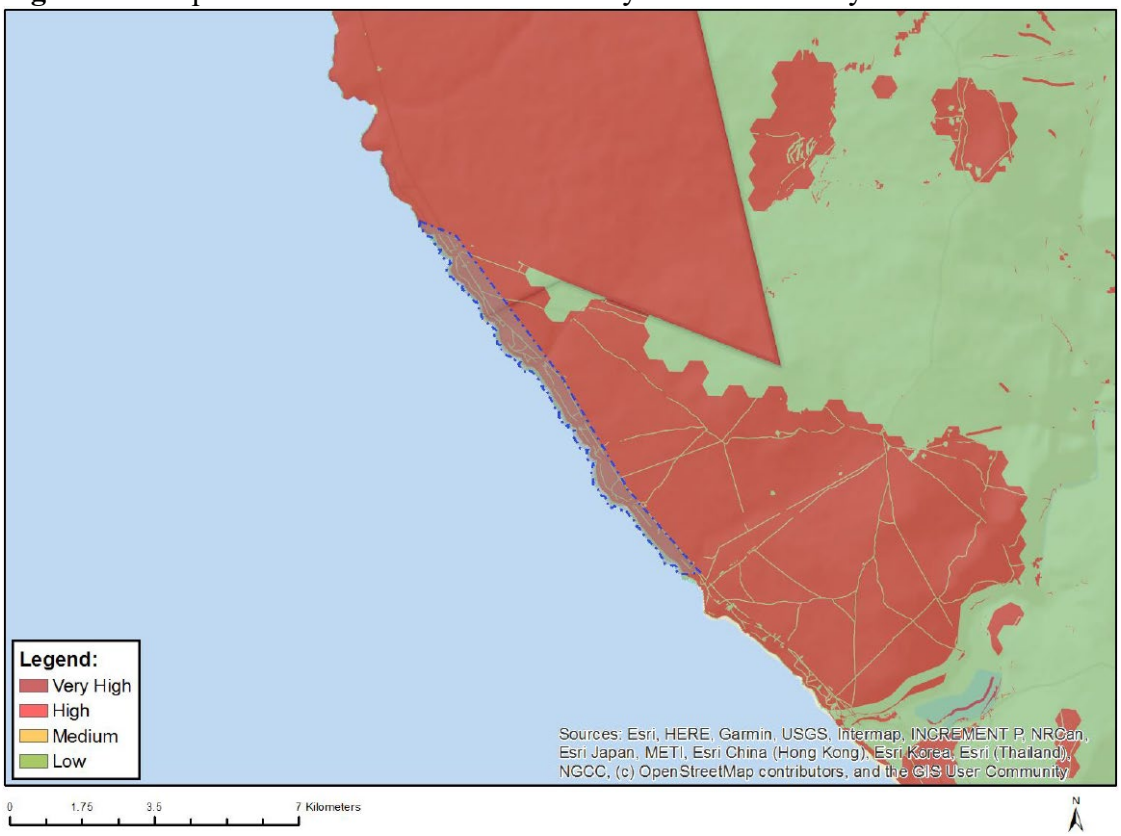


According to the screening report (DEA) the major part of the prospecting area is regarded as very high sensitivity regarding Terrestrial Biodiversity as it is located within Critical Biodiversity Areas and Ecological Support Areas (Refer Table 12 and Figure 20).
The CBAs map of the study area (Figure 16 -19) also indicates that most of the area under application falls within CBAs. These areas have been designated as CBAs to promote coastal resource protection and to maintain ecological processes associated with the coastal strip, especially the ability of fauna to move along the coast. Although CBAs confer no rights and have no official conservation status in law, they provide an indication of ecological status (biodiversity). This does not mean that CBA's need to be fenced off from human use, but rather that they should be supported by good planning, decision-making and management to ensure that human use does not impact on the condition of the ecosystem.

Table 12: Terrestrial biodiversity theme Sensitivity Features

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Critical biodiveristy area 1
Very High	Ecological support area 1
Very High	Ecological support area 2
Very High	Critical biodiveristy area 2

Figure 20: Map of relative terrestrial biodiversity theme sensitivity



9.6 Aquatic biodiversity and Water Resources

The study area lies in the Olifants-Doorn Water Management Area (WMA. Within this WMA, most of the study area falls within DWS's quaternary catchment F60A, comprising a large quaternary without any major rivers. The rivers in the WMA comprise relatively minor systems and have been mapped in the national 1:50 000 river cover as "non-perennial" (i.e., ephemeral) rivers.

The National Ecoregional Classification of Kleynhans et al. (2005) classifies the study area as falling within the Western Coastal Belt Ecoregion. This ecoregion is characterized by plains with low and moderate relief, an altitude between sea level and 700 m amsl and vegetation that comprises primarily Succulent Karoo types (Kleynhans et al. 2005). The ecoregion includes the Olifants, Doring, Sout, Groen, Buffels and western section of the Orange Rivers.
The Sout River passes into the Atlantic Ocean via its estuary, approximately 4Km south of the study area boundary.

Wetlands in the surrounding area comprise mainly pans, which are classified by Ollis et al (2013) and identified in NFEPA data as "depressions". However, no wetlands occur in the study area. The only estuaries close to the study area are the intermittently-open Sout River estuary approximately 4Km to the south.

Specialist studies completed for the area suggests that the potential groundwater flow in the area will accumulate in the shallow subsurface above bedrock material and follow low-lying topographical trends. As such, any seep into the subsurface is expected to flow down towards bedrock, where it would accumulate/mound and then begin flowing towards the coast. Any sources of contamination in this seep will likely follow a similar path, and over time trend towards the coast. As there are no current groundwater users, the coastal environment is the only receptor to this flow.

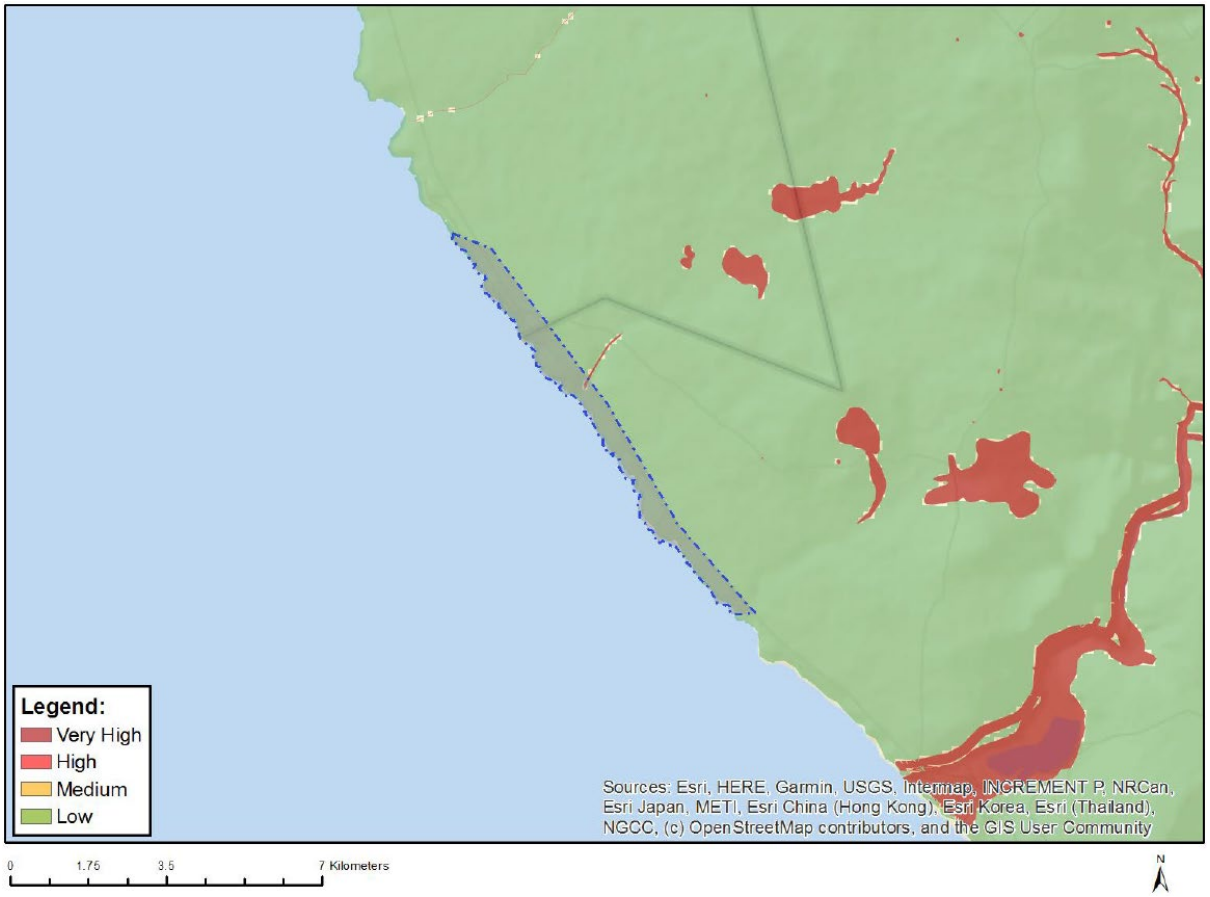
According to the screening report (DEA) the prospecting area is rated as having a very high sensitivity regarding Aquatic biodiversity (Table 13 & Figure 22). Ground truthing has shown that none of the features listed in table 13 is present within the boundaries of the study area. The very small wetland indicated on the boundary of the study area (Figure 22) and rendering Aquatic Biodiversity with a "very high" rating could potentially comprise of a watercourse. Note that ground-truthing confirmed that it is unlikely ever to convey surface flows, and it is assumed that it results from desktop mapping due to a farm road following the same footprint. The drainage line dissipates into the sands following all but the most major of storm events, largely because of the high evaporation rate that characterizes this region (Schulze 2007). The drainage line is not even associated with obvious riparian zones and it is assumed that flow occurs in this system too infrequently to sustain riparian species. The SANBI BGIS databases (www.bgis.sanbi.org (Figure 21) does not even recognise this area as a wetland feature. According to several Aquatic Biodiversity Impact Assessment completed for large scale mining within the study area, the area is of Low Aquatic Sensitivity. Considering the vulnerability of the potential wetland, a no-go buffer of 100m will be provided for in the EMPr around the identified area.

Figure 21: Location of Prospecting area (yellow polygon) in relation to Aquatic biodiversity and Water Resources

Table 13: Aquatic biodiversity theme Sensitivity Features

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

Figure 22: Map of relative Aquatic biodiversity theme sensitivity



9.7 Socio-economic (West Coast District Municipality IDP 2022-2027)

The West Coast District's (WCD) population is expected to grow at an average annual rate of 1.7 per cent, rising from an estimated 464 056 people in 2020 to 496 511 in 2024. This growth rate is slightly lower than that of the Western Cape at 1.8 per cent across the same period. Despite vibrant economic activity in the Swartland, Saldanha and Bergrivier areas, large parts of the WCD remain impoverished. The WCD has the second lowest GDPR per capita in the Province and its Gini-coefficient (reflection of income inequality) has been worsening in recent years. Overall quality of life, as measured through the human development index (HDI) has however been improving. Residents of the WCD enjoy relatively high basic service delivery access levels i.e., 98.3 per cent for water, 94.0 per cent for electricity, 76.9 per cent for refuse removal, 87.2 per cent for sanitation and 86.7 per cent for housing.

The district's economy maintained an annual average GDPR growth rate of 1.5 per cent from 2014-2018 but fell into recession in 2019 with an estimated growth rate of -1.2 per cent. In 2018 the economy was mostly driven by activities within the manufacturing; agriculture,

forestry, and fishing; as well as wholesale and retailed trade, catering, and accommodation sectors.
The impact of the drought has had a significant impact on the agriculture, forestry, and fishing sector within the district, not only in terms of diminished production yield that negatively affected exports, but also in terms of job losses.

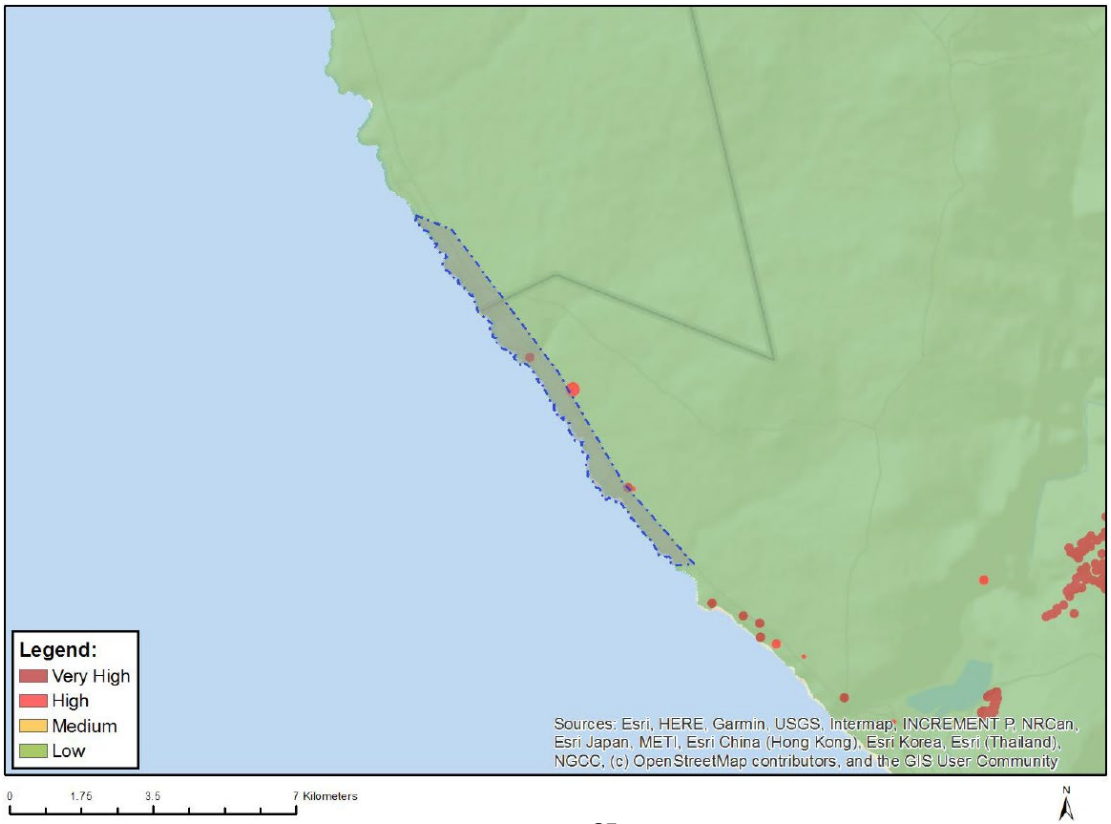
9.8 Paleontological, Archaeological and Cultural and Heritage Resources

All aspects of the proposed development are relevant, since excavations and or clearing may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.
According to the screening tool the relative archaeological and cultural heritage sensitivity is rated as very high (Refer Table 14 and Figure 23). A Phase 1 Heritage Impact Assessment (HIA) as well as an Underwater Heritage Impact Assessment (UHIA) will be undertaken due to the very high sensitivity result stipulated in the screening tool report and observation of heritage features such as shell middens within the proposed site. There is also the possibility of shipwrecks in the surfzone although none was observed within the development area
The applicant has appointed specialists to undertake the assessments and compile the reports. All mitigating measures proposed will be included as part of the EMPr.

Table 14: Archaeological and Cultural and Heritage theme Sensitivity Features

Sensitivity	Feature(s)
High	Within 150m of a Grade IIIa Heritage site
High	Within 100m of a Grade IIIb Heritage site
Low	Low sensitivity
Very High	Within 100m of an Ungraded Heritage site

Figure 23: Map of relative Archaeological and Cultural and Heritage theme sensitivity



According to the screening tool the relative paleontological sensitivity for a very small inland portion of the study area is rated as very high (Figure 24) and this is confirmed by the SAHRIS Palaeosensitivity map (Figure 25).
A Phase 1 Paleontological Impact Assessment (PIA) will be undertaken due to the very high sensitivity result stipulated in the screening tool report.
The applicant has appointed specialists to undertake the assessments and compile the reports. All mitigating measures proposed will be included as part of the EMPr.

Table 15: Palaeontological theme Sensitivity Features

Sensitivity	Feature(s)
Low	Features with a Low paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

Figure 24: Map of relative Palaeontological theme Sensitivity

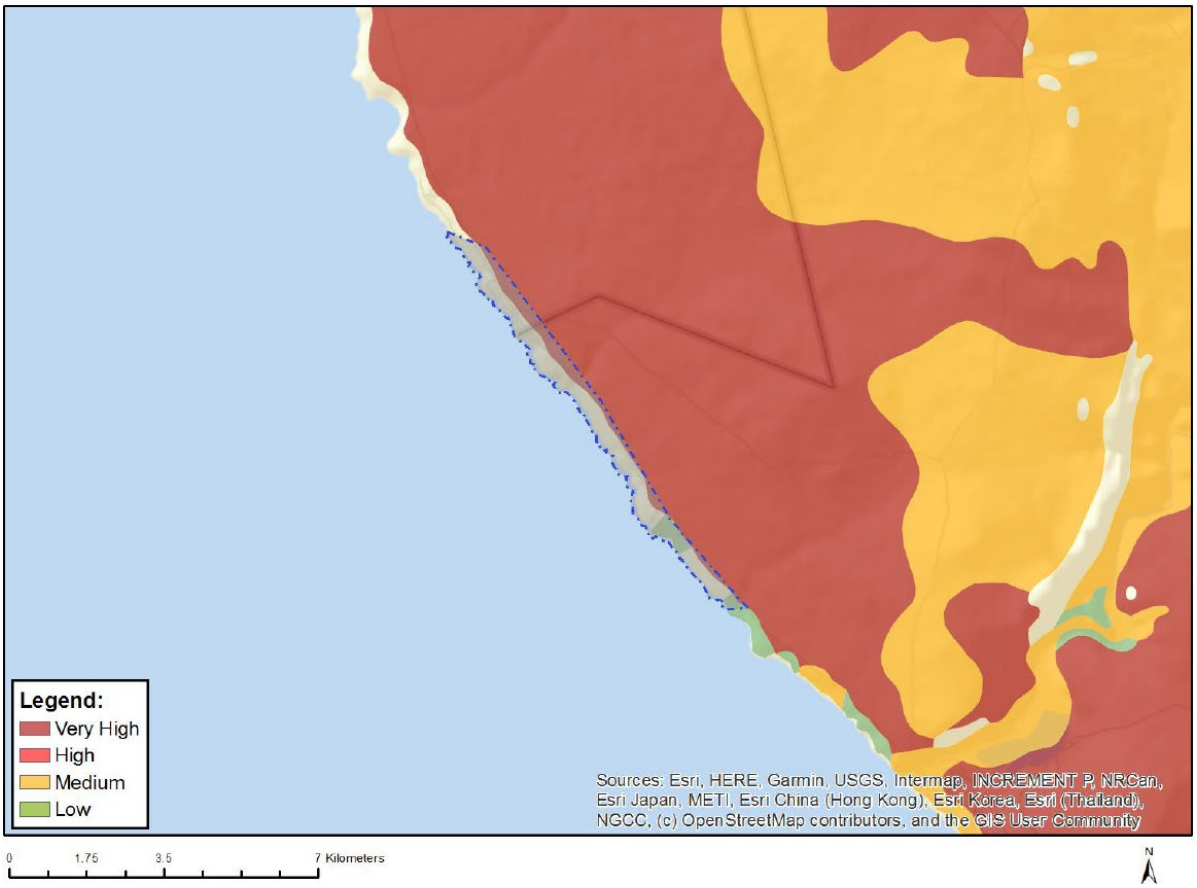
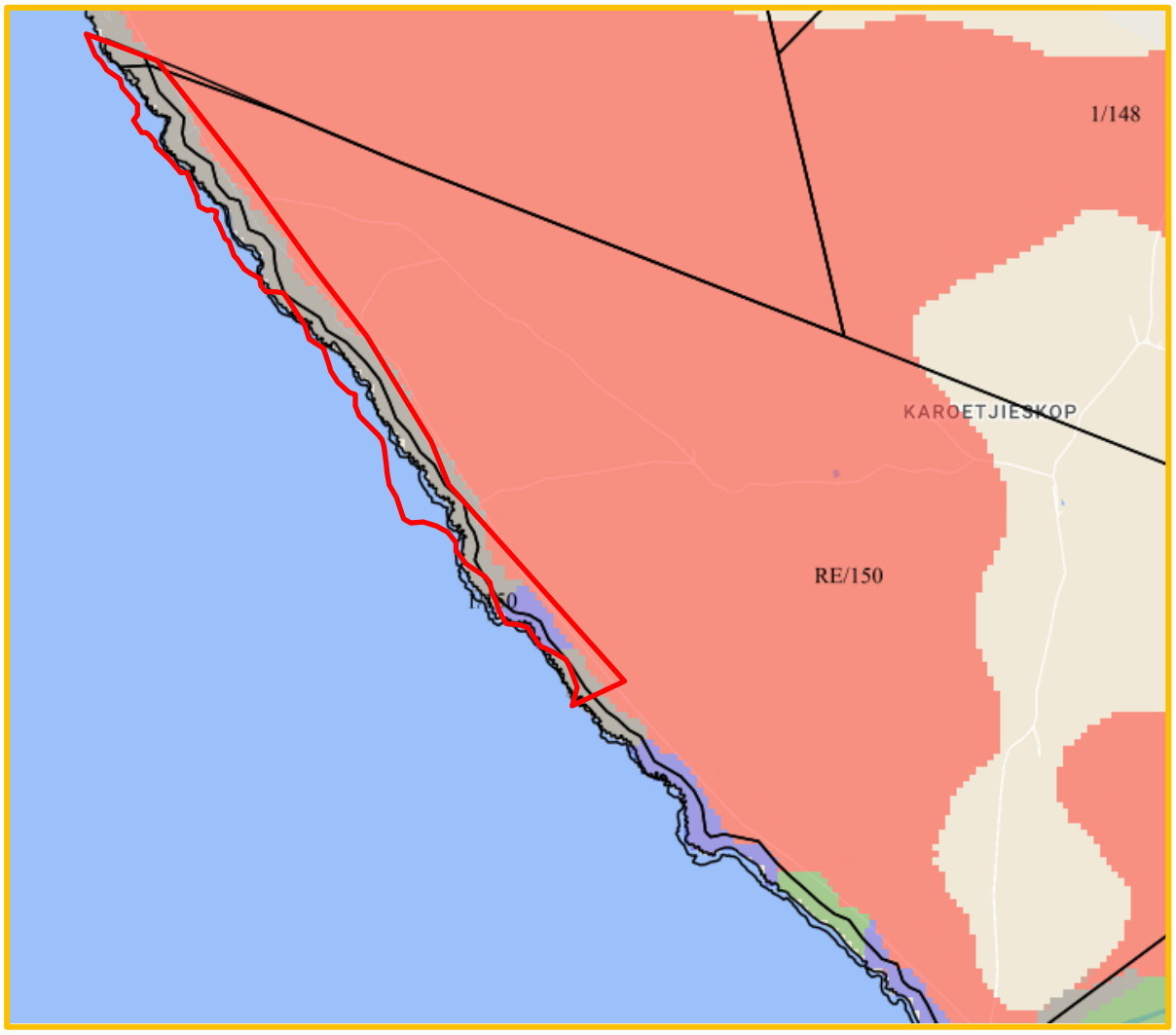


Figure 25: Extract from the SAHRIS Palaeosensitvity map showing the study area to be of very high sensitivity (red shading), low sensitivity (blue shading) as well as zero sensitivity (grey shading).



10 Description of specific environmental features and infrastructure on the site

Based on the outcomes of the initial prospecting phases (non-invasive activities), the location of any invasive activities (sampling) will be determined and the impacts on the identified environmental features will subsequently be determined. It is expected that for the invasive activities (sampling), only localised clearing of shrubs is required.

The area also has a number of farm tracks that traverse the site from the R363 and N7. The invasive activities will seek to use existing roads in order to access the property and it is not expected that any new access roads will be developed. The map Figure 1 & 2 above gives an overview of the prospecting area, settlements and roads that traverse the site.

11 Environmental and current land use maps

Refer section 9 as part of the specific attributes.

12 Impacts and risks identified

As described earlier in this report, the prospecting activities will comprise of desktop and geophysical activities and dependant on the outcome of these phases, targets will be selected for sampling activities.

The impact assessment therefore focuses only on the invasive aspects (sampling and associated activities) as these will have the potential to impact on the biophysical and social environment. The impact assessment is furthermore separated into three distinct phases, namely:

- Construction phase (Site establishment);
- Operational phase (Sampling and Drilling), and.
- Decommissioning

12.1 Potential Risks/impacts

12.1.1 Potential Risks associated with safety

- Safety of personnel and general public due to operating large earth-moving equipment.
- Management of dust, noise and vibration associated with prospecting activities, in relation to surrounding communities.
- Potentially dangerous areas like excavations or equipment left behind and uncontrolled access to a potentially unsafe post-prospecting area.

12.1.2 The potential Risks associated with Environmental features

- Loss of indigenous vegetation due to disturbed footprints at sample areas.
- Increased soil erosion causing loss of topsoil.
- Oil fuel leaks onto soil through the earthmoving and transport equipment and machinery or spillage of fuel during the transfer from fuel bowser to equipment.
- Post-prospecting topography is not compatible with the original landform.
- The post-prospecting landscape increases the requirement for long-term monitoring and management.
- Change in topography due to spoils from excavations remaining after sampling.
- Unwanted ruins, buildings, foundations, footings and waste management practices creating or leaving legacies.
- Equipment and other items used during the prospecting operation were left behind.
- Incomplete removal of re-usable infrastructure.
- Rubble from demolished infrastructure left behind.
- Disturbance to sensitive environments such as Critical Biodiversity areas and any associated biodiversity corridors, land with historical or conservation value part of NPAES, Wetlands and other Aquatic Ecosystems, terrestrial habitats for species of conservation concern (SCC) and high potential agricultural land.
- Potential contamination of groundwater from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.
- Chemical contaminants impacting surface and/or groundwater quality or resulting in discharge that exceeds the concentrations permitted.
- Waste classes are not kept in separate streams and incomplete removal of waste.
- Vehicle wash bays and workshop facilities produce petrochemical and solvent contaminated runoff.
- Sanitary conveniences, fuel depots or storage facilities of potentially polluting substances can contaminate surface water.

12.1.3 Potential risks associated with viable and sustainable land.

- Uncontrolled expansion of prospecting footprint by not restricting the area disturbed by prospecting and the associated activities/infrastructure, resulting in loss of land with agricultural potential.
- Uncontrolled development of roads, where existing farm roads are not used for prospecting operations and redundant internal roads are left behind.

- Post-prospecting landform not compatible with the surrounding landscape and not capable of productive land use that achieves a land capability equal to that of pre-prospecting conditions.
- Sub-surface infrastructure remaining behind, limiting the intended post-closure land use including footings and foundations, power supply and water installations including pumps and pipelines.
- Long term changes in land use are caused by not implementing prompt rehabilitation and maintenance of disturbances when possible as part of the annual rehabilitation plan.
- Unsuccessful rehabilitation can reduce the post-prospecting land use options. Rehabilitated areas could be too unstable to support post-prospecting land use objectives compatible with surrounding areas.
- Disturbance of ecology due to loss of habitat and cumulative impact of illegal collecting during long-term or life of mine can degrade areas and reduce the viability of adjacent areas.
- Inadequate control of alien invasive vegetation species can result in the establishment of populations or seed sources that threaten adjacent areas.

12.1.4 Potential Risks associated with a post-prospecting landform.

- Impact on surface water through modification of infiltration rates by increasing the extent of hardened surfaces.
- Inadequate topsoil restoration or creation of unnatural surface topography or slope form which could impact lower or adjacent slopes due to increased runoff velocity.
- Altered storm water runoff response due to large impervious areas and concentrated runoff in drainage systems. Concentrated storm runoff from infrastructure areas is erosive, causing sheet, rill and donga erosion features.
- Potentially dangerous areas like excavations incorrectly rehabilitated including uncontrolled access to potentially unsafe post-prospecting areas.

12.1.5 Potential Risks associated with the socio-economic environment.

- Disturbance of local communities in urban and rural areas caused by noise and dust emissions and increase in heavy vehicles along transport routes.
- Temporary exclusions of recreational activities in active mining areas.
- An influx of people into the local communities looking for work, with an increase in demand for housing, schooling and services. Such an influx of workers into a community often results in a change in social dynamics.
- Positive impacts include, for example, the creation of both formal and informal businesses to supply additional needs, whilst negative social impacts include, for example, an increase in substance abuse, HIV transmission and unwanted pregnancies.
- Staff losing their jobs at mine closure can have devastating effects on communities that are reliant on mine-based income.
- Job losses of secondary industries, businesses and contractors and contractual agreements with service providers surpassing mine closure date.
- Lack of compliance with the approved EMPr and a lack of auditing of the EMPr.
- Prospecting activities closure stalled due to non-compliance with relevant legislation (national, provincial and local).
- Insufficient funds for complete rehabilitation.

12.1.6 Potential Risks associated with visual intrusion, noise, vibration, light pollution, and air emissions.

- Terrain morphology plays a critical role in defining the visual envelope of prospecting developments and can either reduce or enhance visual impact. Apart from visual intrusion, there is also the risk of a reduced sense of place. The visual intrusion impact of prospecting activity would be on nearby roads, homesteads, settlements, recreational activities, and along tourism routes or corridors.
- The visual disturbance would be caused by prospecting activities such as excavations. Machinery and structures provide a colour contrast, as do disturbed areas against adjacent natural areas.
- Nuisance effects of air emissions due to a lack of implementation of dust suppression activities could impact on communities.
- Dust generated on haul roads reduces visibility, representing a safety hazard.
- Dust can retard vegetation growth and reduce the palatability of vegetation.
- The cumulative effect of a rise in the ambient noise levels or high noise levels in specific areas that exceed specified levels would impact on communities in close proximity.
- Noise disturbance and light pollution would result from night-time activities (if applicable) in areas that are in close proximity to communities.

12.1.7 Potential Risks associated with regard archaeological, cultural heritage or paleontological sites

- Disturbance of identified surface, or unknown sub-surface sites, if mitigation and monitoring is not implemented as per mitigating measures in the Heritage and Palaeontology Impact Assessment
- Progressive development can encroach upon or disturb identified sites.

12.1.8 Potential Impacts and Risks associated with the Preferred Alternative.

Refer to Section 3, Section 5 and Section 6 above, which describes the location, type of activity, design or layout, technology and operational alternatives, and the preliminary result of having a preferred and only alternative. The potential impacts and risks associated with this preferred and only alternative are listed in Table 16 below.

12.1.9 Potential Impacts and Risks associated with the No-Go Alternative

There would be no change to the biophysical environment with the No-Go Alternative. The No-Go Alternative implies that the Applicant would forgo an opportunity to provide employment opportunities in an area and sector identified for opportunities for job provision and economic growth, and the sourcing of minerals. This potential would not be reached with the "no-go" option.

Table 16: Preferred Alternative: Potential Impacts and Risks per Phase per Activity

Phase	Activities	Potential Impacts
Construction Phase Site establishment	Access & Haul Roads	Dust generation from vehicles using existing access and haul roads
		Soil compaction from repeated use of existing access and haul roads
	Construction of Site Establishment Activities (Including associated infrastructure, Water and wastewater infrastructure, Electricity infrastructure, Waste management, Storm water control)	Topsoil stripping and stockpiling, soil erosion and soil compaction (land capability)
		Surface and ground water resource pollution
		Water resources (Quality & Quantity) from activities within drainage channels and water abstraction
		Biodiversity disturbance from activities and vehicles. Disturbance of onsite Wildlife and Vegetation from removal of existing vegetation from sampling areas and service roads.
		Soil compaction from repeated use of access track to sampling sites (twee-spoor) and Soil erosion from exposed areas
		Soil contamination and waste management
		Dust fall, nuisance from activities & visual intrusion from development
		Emissions (Dust and light), Noise and Vibration causing nuisance from topsoil stripping, site establishment activities and vehicles
		Potential impacts on archaeological and paleontological resources
		Socio- economic impact
Operational Phase Sampling	Collection of samples and Sample Analysis (Including: excavations, refueling, waste generation & management, spoils, and overburden dumps	Change in topography
		Erosion control or runoff diversion structures and soil compaction (land capability)
		Water quantity, abstraction from water resources
		Water quality, potential for groundwater pollution from hydrocarbons.
		Biodiversity disturbance from activities
		Soil contamination and waste management
		Visibility of prospecting operations
		Dust, vehicle, noise and light emissions from site activities and haul trucks
		Potential impacts on archaeological and paleontological resources
		Lack of socio-economic impact on job security, employment creation and economic spin-offs (i.e., prior to prospecting)
Decommissioning Phase	Rehabilitation of the prospecting right area: backfilling shaping landscape profile; scarifying compacted areas and vehicle tracks; replacing topsoil, etc.	Biodiversity (wildlife and vegetation) disturbance from vehicles
		Dust and vehicle emissions from rehabilitation activities
		Soil erosion of topsoil before vegetation is re-established
		Visibility of the rehabilitated prospecting operations, erosion control or run-off diversion structures
		Socio-economic impacts: employment during rehabilitation and decommissioning activities.

12.2 Methodology used in determining the significance of potential impacts

Refer to Table 17 below, which provides the impact assessment criteria applied in the rating of the impacts associated with each phase of the proposed prospecting activity for the Preferred and Only Alternative.

Table 17: Impact Assessment Criteria

ASSESSMENT CRITERIA	
Nature	
Rating	**Criteria**
Positive	Beneficial to the receiving environment
Negative	Harmful to the receiving environment
Neutral	Neither beneficial or harmful
Severity	
Rating	**Criteria**
6 Very High	The impact is result in a complete loss of all resources. Irreparable damage to highly valued species, habitat or ecosystem.
5 High	The impact will result in significant loss of resources. Very serious, long-term environmental impairment of ecosystem function that may take several years to rehabilitate.. Very serious widespread social impacts. Irreparable damage to highly valued items.
4 Medium	The impact will result in marginal loss of resources. Serious medium term environmental effects. Environmental damage can be reversed in less than a year. On-going social issues. Damage to structures/items of cultural resources of low significance, mostly repairable.
3 Low	Moderate, short- term effects but not affecting ecosystem function. Rehabilitation requires no intervention of external specialists and can be done in less than a month. On-going social issues. Some damage to insignificant cultural resiurces.
2 Very low	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants. Minor medium-term social impacts on local population. Low-level repairable damage to commonplace historical structures
1 None	The impact will not result in the loss of any resources. Limited damage to minimal area of low significance, (e.g. ad hoc spills within plant area). Will have no impact on the social environment. Cultural functions and processes not affected.
Spatial Scale	
Rating	**Criteria**
6 Very High	Will affect areas across international boundaries
5 High	Will affect the entire country
4 Medium	Will affect the entire province or region
3 Low	Will affect the local area or district
2 Very low	The impact will only affect the site
1 None	The impact will only affect portions of the site
Duration	
Rating	**Criteria**
6 Very High	Permanent no mitigation possible
5 High	Permanent but mitigation possible
4 Medium	Long term (6-15 years)
3 Low	Medium term (1-5 years)
2 Very low	Short term (Less than 1 year)
1 None	Immediate (Less than 1 month)

Probability	
Rating	**Criteria**
6 Very High	Certain/Definite Impact will certainly occur (100% probability of occurring)
5 High	Almost certain/ High probability Impact will occur (>75% probability of occurring)
4 Medium	Impact likely to occur (50 - 75% probability of occurring)
3 Low	Impact may occur (25-50% probability of occurring)
2 Very low	Unlikely/ Low probability. Impact unlikely to occur (0 - 25% probability of occurring)
1 None	Highly Unlikely/ None Impact unlikely to occur (0% probability of occurring)

SIGNIFICANCE Consequence x Probability Presented as a score out of 108	
Rating	**Criteria**
84-108 High	Long-term environmental change with great social importance.
50-83 Medium	Medium to long term environmental change with fair social importance.
27-49 Low	Short to medium term environmental change with little social importance.
12-26 Very low	Short-term environmental change with no social importance
3-11 None	No environmental change
Unknown	Due to lack of information

	Consequence = Severity + Spatial Scale +Duration Presented as a score out of 18															
		3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Probability	**1**	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	2	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
	3	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54
	4	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72
	5	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	6	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108

CUMULATIVE EFFECTS	
Rating	**Criteria**
High	The impact would result in significant cumulative effects
Medium	The impact would result in moderate cumulative effects
Low	The impact would result in minor cumulative effects

REVERSIBILITY	
Rating	**Criteria**
Reversible	Impacts can be reversed though the implementation of mitigation measures
Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures

DEGREE TO WHICH IMPACT COULD BE AVOIDED/MANAGED/MITIGATED	
Rating	**Criteria**
High	The impact could be significantly avoided/managed/mitigated.
Medium	The impact could be fairly avoided/managed/mitigated.
Low	The impact could be avoided/managed/mitigated to a limited degree.
Very Low	The impact could not be avoided/managed/mitigated; there are no mitigation measures that would prevent the impact

12.3 Positive and negative impacts of proposed activity and alternatives

12.3.1 Positive impacts

- Creation of employment and job security with economic spin-offs.
- Provision of minerals for local and international markets.

12.3.2 Negative impacts

The key potential negative impacts associated with the prospective activity include the following:

- Site access:
  - Disturbance of onsite biodiversity. fauna and flora.
  - Soil compaction from repeated use of access tracks.
- Site Establishment Activities (topsoil stripping and stockpiling, placement of logistics, waste generation and management)
  - Visual intrusion.
  - Emissions (dust, vehicle and noise) from topsoil stripping; vehicles and machinery.
  - Wildlife and vegetation disturbance from site preparation.
  - Contamination and disturbance of topsoil and soil from compaction, including soil disturbance due to topsoil stockpiling.
  - Waste generation.
  - Water use for dust suppression during site establishment.
- Prospecting activities:
  - Noise is caused by the machinery and vehicles on-site, and by vehicles on haul roads.
  - Visibility of the prospecting operations.
  - Dust emissions from general site activities (vehicle entrained dust).
  - Disturbance of biodiversity due to prospecting operations.
  - Contamination of soil from hydrocarbon spills and compaction on access tracks.
  - Contamination of groundwater through unmanaged use of machinery.
  - Storage and use of hazardous chemicals in processing.
  - Disturbance to Heritage and Paleontological resources.
  - Unauthorised access to prospecting activities leading to injury.
  - Exclusion of active mining areas from tourism activities
- Rehabilitation of the prospected area:
  - Dust emission from decommissioning activities (vehicle entrained dust).
  - Soil erosion of topsoil.
  - Revegetation slow due to poor rehabilitation and topsoil return.

12.4 Mitigation measures to be applied

Refer to Table 19 for the mitigation measures included under each impact. The detail mitigating measures are as follows:

12.4.1 Site Access and Site Establishment

<u>Soil and Land Capability:</u>

The impacts of soil and land capability have been assessed as being of low significance even before mitigation.

The impact can be reduced to very low by only using existing farm roads and tracks. Where new access tracks are required to get to the sampling site, the impact can be reduced if no vegetation will be cleared. Leaving roots intact will prevent soil loss and enable vegetation to coppice and regrow. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces.

Where clear scraping (dozing) or removal of vegetation cannot be avoided areas should be kept to an absolute minimum. All tracks (twee-spoor) will be scarified and any topsoil stockpiled removed to be spread over the disturbed area. Dual use access roads must be handed back to the landowner in a good state of repair.

Biodiversity Flora and Fauna:

The impacts of sampling (pit excavation and soil compaction) have been assessed as being of medium significance before mitigation.

The impact can be reduced to very low significance by limiting the activities and clearance to the smallest area that is necessary and rehabilitating the disturbed area as soon as possible. Furthermore, no clear scraping (dozing) will be carried out unless absolutely necessary. Rather that surface vegetation be cleared leaving the roots intact will ensure that vegetation can coppice and regrow. Vehicle's speed must take into account the possibility of collisions with fauna.

Aquatic Biodiversity and Water Resources:

Potential Impacts on Aquatic biodiversity & Water Resources is assessed as being of insignificance even before mitigation.

The impact can be avoided by ensuring that measures are put in place to prevent any sampling activities within 100m from a water course. Maintaining all equipment as per supplier specification and using drip trays under stationary equipment and diesel bowser to contain any spillages, should it occur including having oil spill kit as a recovery measure will prevent contamination.

Emissions (Air quality, visual intrusion & Noise Generation):

The impact of emissions is assessed as being of low significance before mitigation. If the mitigation measure below is put in place the significance rating can be reduced to insignificant. It is important to note that people experience dust deposition as a nuisance effect, and that there are no direct human health implications because the dust is not inhaled. Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent where transpiration and photosynthesis are affected.

The impact can be reduced by wet suppression and enforcement of low vehicle speeds. Separation of distance of minimum 100m, but preferably 500m to be maintained between sample sites and dwellings will also reduce the impact of dust fall.

The nuisance (visual) impact can be reduced by taking into account available vegetation screening, the locations of visual receptors on the prospecting areas and adjacent properties and locating the equipment in a way that it is screened from points of visual reception wherever possible.

Considering the existing background noise levels of the general area which is rural in nature, the significance of the noise caused by the earth moving equipment, vehicles going to and from each sampling is also low before mitigation. Mitigation if required will include limiting the site establishment activities to daylight hours (06h00 to 18h00) and not undertaking such activities at all on Sundays and public holidays, as well as by applying a separation distance of a minimum 100m, but preferably 500m between sample sites and any dwellings. The vehicles on site will be limited to the absolute minimum required. It must be noted that the speed limit for driving within the prospecting area shall be limited to 30Km/h.

Socio- economic impact

Refer Operational phase below

Palaeontological, Archaeological and Cultural Heritage Resources

The impact on Cultural and Heritage Resources is assessed as being of high significance before mitigation. The impact can be avoided by ensuring that recommendations from specialist studies listed below are implemented (Refer Figure 23 above).

- All the identified archaeological sites and their buffers must be avoided if possible;
- If avoidance of archaeological sites (Grade GPB or higher) is not possible then they must be sampled by a qualified archaeologist under a permit issued by SAHRA/HWC;
- All surface disturbance must be rehabilitated; and
- If any archaeological material or human burials are uncovered during the course of the development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Further additional specific conditions as provided by HWC and SAHRA for the development will be included as follows:

- APM Unit conditions: No-go bufferzones of 30 m must be maintained around all identified heritage sites of Grade GPB or higher;
- If it is not possible to avoid the above sites, permits in terms of section 35(4) of the NHRA must be applied for prior to construction commencing;
- 38(4)c(i) - If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA/HWC must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51 (1) e of the NHRA and item 5 of the Schedule;
- 38(4)c(ii) - If unmarked human burials are uncovered, the SAHRA/HWC, must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51 (1) e of the NHRA and item 5 of the Schedule;
- 38(4)d - See section 51 (1) of the NHRA regarding offences;
- 38(4)e - The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA/HWC;

Regardless of the above recommendations, all sample sites should be carefully inspected by project staff to ensure that no heritage features are present. Equipment moving on site will, where ever possible, be confined to established roads and tracks. Where this is not possible, access routes will be walked prior to entry of equipment to ensure that there are no graves present. Should graves be identified, the access route will be realigned to avoid such heritage resources, which will then be clearly marked with stakes and Chevron tape to minimise risk of accidental damage. If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Any identified heritage feature will be cordoned off with stakes and Chevron tape and measures put in place to prevent any activities within 100m. All personnel including contractors involved in the construction activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them. Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed.

No-go areas of particular palaeontological sensitivity are not identified in the Project Area. The only requirement is that the Environmental Control Officer (ECO) for the project must inform staff of the need to watch for potential fossil occurrences at the sample sites and implementing the fossil Chance Finds Procedure in the event of any chance finds of fossils. In the context under consideration, it is improbable that fossil finds will require delineation of "no go" zones. At most a temporary pause in activity at a limited locale may be required. The strategy is to rescue the fossil material as quickly as possible.

The procedures below are in general terms, to be adapted as befits a context. They are couched in terms of finds of fossil bones that usually occur sparsely. However, they may also serve as a guideline for other fossil material that may occur. Bone finds can be classified as two types: isolated bone finds and bone cluster finds.

Isolated Bone Finds

In the process of sampling and excavations, isolated bones may be spotted in the hole sides or bottom, or as they appear on the spoil heap. By this is meant bones that occur singly, in different parts of the excavation. If the number of distinct bones exceeds 6 pieces, the finds must be treated as a bone cluster (below).

Response by personnel in the event of isolated bone finds

- Action 1: An isolated bone or tooth exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside. This also applies to potential fossils of any kind embedded in broken chunks of cemented deposit.
- Action 2: The Project Manager/Geologist/Environmental Control Officer (ECO) must be informed.
- Action 3: The responsible field person (geologist or ECO) must take custody of the fossil. The following information to be recorded:
- Location co-ordinates (such as obtained by GPS in decimal degrees).
- Digital images of excavation showing vertical section (mine face) and position of the find.
- Digital images of fossil.
- Geological context obtained from the mine geologist.
- Action 4: A loose fossil should be placed in a bag (e.g., a Ziplock bag), along with any detached fragments. A label must be included with the date of the find, position info., depth. Cemented deposit chunks with an embedded fossil must also be labelled (e.g., with a paint marker) and appropriately stored for safekeeping.
- Action 5: Geologist/ECO contacts the standby palaeontologist and/or SAHRA to describe the occurrence and provide images asap. by email.

Response by Palaeontologist in the event of isolated bone finds

The palaeontologist or SAHRA will assess the information and liaise with the prospecting rights holder, the land owner and the ECO/geologist and a suitable response will be established. On the discovery of conservation-worthy fossils, a collection permit must be applied for from the South African Heritages Resources Agency (SAHRA).

With the passage of time arrangements must be made to transport fossil material deemed worthy of conservation and study to an appropriate curatorial institution.

Cluster Finds

A bone cluster is a major find of bones, i.e., several bones in close proximity or bones resembling part of a skeleton. These bones will likely be seen in broken sections of the sides of the hole and as bones appearing in the bottom of the hole and on the spoil heap.

On the basis of existing observations of the Buffelsrivier fluvial deposits it is unlikely that a major bone cluster find will be encountered.

Response by personnel in the event of a bone cluster find

- Action 1: Immediately stop excavation in the vicinity of the potential material. Mark (flag) the position and also spoil that may contain fossils.
- Action 2: Inform the pit foreman and the ECO.
- Action 3: ECO contacts the standby archaeologist and/or palaeontologist. ECO to describe the occurrence and provide images asap. by email.

Response by Palaeontologist in the event of a bone cluster find

The palaeontologist will assess the information and a suitable response will be established. It is likely that a Field Assessment by the palaeontologist will be carried out asap.

It will probably be feasible to "leapfrog" the find and continue the excavation farther along, or proceed to the next excavation, so that the work schedule is minimally disrupted. The response time/scheduling of the Field Assessment is to be decided in consultation with the rights holder, the owner and the environmental consultants.

The field assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted. The find must be evaluated by a human burial specialist.
- If the fossils are in an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is required.
- If the fossils are in a palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is required.

Rescue Excavation

Rescue Excavation refers to the removal of the material from the excavation. This would apply if the amount or significance of the exposed material appears to be relatively circumscribed and it is feasible to remove it without compromising contextual data. The time span for Rescue Excavation should be reasonably rapid to avoid any undue delays to the mining schedule.

In principle, the strategy during mitigation is to "rescue" the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossils and whether in loose or in lithified sediment. These could include:

- On-site selection and sieving in the case of robust material enclosed in loose material.
- Fragile material in loose/crumbly sediment would be encased in blocks using Plaster-of Paris or reinforced mortar and removed for preparation in a laboratory.
- Chunks of cemented rock with embedded fossils would be carefully trimmed of unnecessary excess rock and removed for preparation in a laboratory.

If the fossil occurrence is dense and is assessed to be a significant find then carefully controlled excavation is required.

12.4.2 Operational Phase

<u>Soil and Land Capability:</u>

The impacts of soil compaction have been assessed as being of low significance. The impact on soil contamination can be reduced to very low by the mitigating measure applicable to waste management and by limiting the activities and clearance of the sampling site to the smallest area that is necessary. Furthermore, no clear scraping (dozing) will be carried out unless

absolutely necessary and in this case the compacted area will be scarified and any topsoil stockpiled removed to be spread over the disturbed area immediately after completion of the activity.

Topography

The impacts of topography have been assessed as being of very low significance before mitigation. The impact can be reduced to one of insignificant by backfilling of excavations whereafter the change in topography from prospecting activities would be slight depressions created in the landscape. In the surf zone environment, the topography will be reinstated after each high tide or storm event.

All spoils need to be returned to the excavations for backfilling. Pit development will be the same as for trench development (Bulk Sampling), but on a much smaller scale. There will only ever be three prospecting pits open at any given time, one in the process of rehabilitation, one that is operational and one in the process of development and it is anticipated that no more than 20 such pits will be developed.

After results are logged the pit will be backfilled immediately for security and safety reasons before the project is moved to the next pit position. In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation.

Biodiversity Flora and Fauna:

Disturbance of Biodiversity wildlife and vegetation in areas where sampling is taking place is rated as being of medium significance.

The impact can be reduced to very low significance by prior delineation of the area via geophysical characterisation in order to minimise the area that needs to be disturbed. Furthermore, no clear scraping (dozing) must be carried out unless absolutely necessary.

Sample sites where clear scraping were required must be rehabilitated by scarifying trampled and compacted areas to a dept of ±300mm areas. Windrows created by scarifying needs to be left in place to create a rough surface that can act as seed trap and create a micro-habitat to promote natural re-vegetation.

Aquatic Biodiversity and Water Resources:

The potential impact on Aquatic Biodiversity and Water Resources is assessed as insignificant even before mitigation mainly due to contamination of surface and groundwater with hydrocarbons. The impact can be further reduced by implementing the measures recommended for the construction phase. Fuel storage must be contained in mobile bowsers and refuelling will be done with care to minimise the chance of spillages. Only re-fuel machines at fuelling station, if possible, construct structures to trap fuel spills at fuelling station. Oils and lubricants must be stored within sealed containment structures and minimise storage of hazardous substances onsite.

Only emergency repairs to mechanical equipment will take place onsite. Repairs must be undertaken on drip trays or UPVC sheets to prevents spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Ensure vehicles and equipment are in good working order and regularly inspected for leaks and drivers and operators are properly trained.

Any spillages will be cleaned up immediately and dispose contaminated material (soil, etc.) at licensed sites only.

A spill kit will be available on each site where prospecting activities are in progress. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998) without the necessary authorisations.

Emissions (Air quality, visual intrusion & Noise Generation):

Refer Site Access and Site Establishment phase above

Socio- economic impact

Job creation and local economic spin offs through increased income earned, and through purchasing of local materials is a positive impact and outweigh the insignificant negative impacts below.

The prospecting sites are located in a rural farming area with farm dwellings. Some landowners cherish the peaceful and quiet lifestyle of the area and friction between local residents and a crew of strangers is very possible. Conflict with other mining companies or land users on the same property is also a possibility. The potential for conflict is assessed as being insignificant. The impact can be further reduced by taking appropriate social management measures.

Non-invasive activities will be completed off-site. All access will be arranged beforehand with landowner and a supervisor will be present at all times and will report to the landowner when accessing and leaving the property. Indemnity will be signed by all mining personnel entering the property to protect the landowner against claims regarding personal loss and injury.

Landowner will be updated with regard to the progress of implementing the PWP and any invasive operation and concurrent rehabilitation will be planned in consultation with landowner.

Agreements between any existing mining operations or other land users and landowner will be respected and adopted as part of this operation.

Palaeontological, Archaeological and Cultural Heritage Resources

Refer Site Access and Site Establishment phase above

12.4.3 Decommissioning phase:

Soil & Land capability

Positive impact after implementation of the following mitigation measures. All compacted areas that are not required for aftercare access shall be scarified. Dual use access roads must be handed back to the landowner in a good state of repair.

Implementing screening as part of the cleaning activities before materials are moved from the mine. The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned. Any compacted movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled.

Redundant structures will be removed for use elsewhere or demolished and discarded. All steel structures and reinforcing will be discarded or sold as scrap. All equipment and other items used during the prospecting operation needs to be removed from the site. Remove all power and water supply installations not to be retained by landowner in terms of section 44 of the MPRDA.

Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site.

Topography

Positive impact as all mitigation will be addressed as part of the annual rehabilitation plan as part of the operational phase. The focus of topographic rehabilitation may not be obvious at the time of mine planning and must be addressed as the mine develops and the Final Rehabilitation, Decommissioning and Closure Plan must be reviewed periodically for continued relevance in the light of changed prospecting path or long-term plans.

When activities are completed on one sample site disturbed site should be rehabilitated immediately as part of the annual rehabilitation plan. Dual use access roads must be handed back to the landowner in a good state of repair.

A review of the final rehabilitation, decommissioning and closure plan must be done annually to ensure all outstanding environmental liabilities are covered and sufficient funds is available to implement the closure plan.

Socio- economic impact

The impact on Socio- economic impact is of low significance and even with mitigation, the impact will remain one of low significance due to the impact off job losses and potential contractual agreements with service providers surpassing mine closure date.

Other impacts like not undertaking environmental management according to approved EMPr and plans and no auditing of the environmental management systems as well as insufficient funds for complete rehabilitation can however be mitigated to some degree as follow.

A review of the final rehabilitation, decommissioning and closure plan must be done annually to ensure all outstanding environmental liabilities are covered and sufficient funds is available to implement the closure plan.

Contract durations with service providers will be limited to address the risk of contractual agreements with service providers surpassing the mine closure date. Maintain positive and transparent relationships with stakeholders as well as maintaining communication channels and undertaking environmental management in accordance with the approved EMPr and Closure Plan.

12.4.4 Assessment of potential cumulative impacts

Cumulative impacts are the successive, incremental, and combined impacts of one, or more, activities on society, the economy, and the environment. Cumulative impacts result from the aggregation and interaction of impacts on a receptor and may be the product of past, present or future activities. In this case the potential cumulative impacts will be insignificant due to the small scale of operations. The total prospecting area is ±412Ha but the total footprint of all disturbance planned is less than 5Ha or 0.01% at the end of the prospecting operation.

12.5 Motivation where no alternative sites were considered

Alternatives have been considered for this project, as described in Section 6 above. Where alternatives are not likely to be considered in the Impact Assessment Phase, reasons have been provided in Section 6 above.

12.6 Statement Motivating the Preferred Sites

The layout and technology of each prospecting pit and associated infrastructure has been determined by the shape, position and orientation of the mineral resource expected to be found. In summary, therefore:

- The Preferred Alternative is the prospecting of diamonds, as per the locations shown in Figure 5.
- The existing access roads will be utilised and sections upgraded or new routes developed as required. No electricity powerline connections are required.
- The preferred activity alternative is the prospecting for alluvial diamonds based on the mineral resources investigated.
- The preferred operational alternative is the method of having three prospecting pits open at any given time, one in the process of rehabilitation, one that is operational and one in the process of development.

The operational approach is practical and based on best practice to ensure a phased approach of prospecting followed by rehabilitation in sequential stages.

There are therefore no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory “no-go” alternative that must be assessed for comparison purposes.

13 Environmental Impact Assessment

13.1 Full Description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site

This BAR and EMPr were compiled through a detailed desktop investigation in order to determine the environmental setting in which the project is located. Input from stakeholders during the public participation process also assist the EAP in the identification of any additional impacts associated with the proposed prospecting activities. The methodology described in Section 12.2 above was used to assess the significance of the potential impacts of the prospecting activities. The assessment of impacts is based on the experience of the EAP with similar projects. The applicant also has practical experience through exploration geologists and therefore the identification of impacts and assessment of their significance is informed by first-hand experience of exploration activities. The mitigation measures proposed in Table 19 are considered to be reasonable and based on the location of the prospecting area and must be implemented in order for the outcome of the assessment to be accurate.

13.2 Assessment of each identified potentially significant impact and risk

The supporting impact assessment is provided in Table 19.

13.3 Summary of specialist reports.

The Screening Report in terms of Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014 was developed to allow a proponent intending to submit an application for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended to screen their proposed site for any environmental sensitivity and enable the applicant to manipulate the development footprint on a site to avoid environmental sensitivities before submitting the application. The Screening Report also identify specialist assessments for inclusion in the assessment report based on the environmental sensitivities of the proposed development footprint.

It is however the responsibility of the EAP to confirm the list of specialist assessments and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation. The site sensitivity verification report is attached as Appendix 2 and also form part of section 9 in this BAR and the specialist studies identified is listed in table 18.

For mining and prospecting operations, the position of the mineral resource is fixed therefore the Screening Report required to accompany any application for Environmental Authorisation is not applicable as there are no alternative footprints for screening and comparison.

For small scale mining and prospecting operations where there will be no permanent infrastructure development and where the location of development is informed by historical prospecting and production records for the area, as well as the most likely position of potential mineral deposits no reasonable and feasible alternatives can be investigated.

In the case of prospecting the location of these sample sites will also not be known at the time that the application for EA is lodged. For prospecting areas, that normally covers a large area it is accepted that some areas will be of high or even very high sensitivity and no specialist assessments is needed to verify this. For this reason, mining operations that is a short-term change in land use must provide mitigation measures and financial provision to return the site to it pre-prospecting during the closure phase not applicable to other development.

For mining operations, the initial list of environmental attributes will be compiled based on experience of the EAP in similar development types and through site visits and appraisals, desktop screening via Geographical Information System (GIS) and aerial photography,

incorporating existing information from previous studies, and input received from authorities and l&APs.

Further to this, the Screening Tool identifies related exclusions e.g., industrial development zones that is not applicable to minerals as the state is the custodian of all minerals and is responsible for the screening process as part of the acceptance process of applications taking into account any section 53 applications by other land users.

Table 18: Summary of specialist studies

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMEN-DATIONS INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE RECOMMENDATIONS HAVE BEEN INCLUDED.
HIA still in process UHIA still in process PIA still in process			

Table 19: Impact assessment

Site Access and Site Establishment - Impacts on other land uses	Significance	Before	After
No Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area identified. No intersection with Environmental Management Frameworks relevant to the application The impact on Civil Aviation and Defence is also not applicable to this application as no high structures will be constructed and no defence installations or test areas are present in close proximity to this project. Initial prospecting will concentrate within the coastal zone and Portion 1 of the Farm Karoetjies Kop belonging to the State and the only land use is uncontrolled recreational activities with ad hoc campsites during the crayfish season. Most of the tracks to be used were developed as a result of these informal camping and the only permanent infrastructure on the property, Silverdoos and Jurg se Kaia, was also develop as informal campsites. This infrastructure is now leased from the Department Public Works by one of the mining companies operating in the area.	**Nature**	Negative	Positive
	Severity	2	1
	Spatial Scale	3	2
	Duration	3	2
	Consequence	8	5
	Probability	3	2
	Significance	24	10
	Cumulative Effects	Very Low	Insignificant
Potential impacts: Conflict with recreational activities (informal campsites) during holiday seasons. Reduced access to the coast **Indirect impacts:** Possible decline of tourism **Residual impacts:** Windblown litter and domestic waste left behind during recreational activities cleaned up by mining company. The presence of an authorised and environmental responsible company on site will also help to mitigate the problem of illegal diggers, crayfish poaching, littering, illegal hunting, and plant (firewood) collection a common occurrence along the west coast.	**Reversibility**		Reversible
	Degree to which the impact can be avoided, managed or mitigated:		High
Mitigation • Install appropriate signage and information regarding coastal access. • Restrict construction activities to the development footprint. • Install appropriate screening of construction sites in line with the scenic nature of the area.			

Site Access and Site Establishment - Impacts on Soil (contamination, erosion, compaction) & Land capability	Significance	Before	After
This region is not suited to the production of arable agricultural products owing to the low rainfall. Consequently, there is no record of any form of agricultural production in the study area.	**Nature**	Negative	Negative
	Severity	4	2
Potential impacts:	**Spatial Scale**	1	1
Soil compaction will result from ongoing repeated use of access tracks.	**Duration**	3	1
The clearing of areas for sampling and logistics will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of of fertile topsoilsoil in the event of rainfall.	**Consequence**	8	4
	Probability	4	4
Potential contamination of soil from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances. Accidental spills not cleaned up immediately.	**Significance**	32	16
Loss of land capability	**Cumulative Effects**	Low	Very Low
Indirect impacts:	**Reversibility**		Reversible
Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning.	**Degree to which the impact can be avoided, managed or mitigated:**		High
Dust impacting on adjacent vegetation and causing a nuisance to workers or residents.			
Compaction of topsoil where vehicles drive outside demarcated areas damages seed bank and habitat for invertebrates.			
Residual impacts:			
Recycling of waste material creates employment.			
Potential loss of invertebrates that live in the top layers of the soil.			

Mitigation

• Existing farm roads and tracks must be used as far as possible. Restrict construction activities to the project footprint areas.

• Existing transformed areas due to historic mining and informal camp sites must be used as laydown and parking areas. Restrict vehicle movements to haul roads and construction areas and prohibit vehicle parking or storage of construction materials outside these areas.

• Use appropriately sized drip trays for all refuelling, repairs or when vehicles are parked.

• In case of new development areas and tracks, no clear scraping (dozing) or removal of topsoil will be carried out if possible. Leaving roots intact will prevent soil loss and enable vegetation to coppice and regrow. Where clear scraping (dozing) or removal of vegetation cannot be avoided areas should be kept to an absolute minimum and incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces.

• Remove and stockpile ±300mm topsoil prior to construction for use to restore disturbed areas. The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis.

• Topsoil storage areas must be convex and should not exceed 2m in height and turn soil or re-use every six months..

• Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction.

• Locate all topsoil stockpiles in areas where they will not have to be relocated prior to replacement for final rehabilitation

• In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles.

• After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff.

• Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and potential stormwater run-off. Stabilized areas shall be demarcated accordingly.

Waste Management

• Separation of wastes into classes will ensure that waste is disposed of safely and according to the correct procedure. In order to ensure that waste classes are kept in separate streams, people will be trained on the different waste classes. Recycling and reusing materials may reduce garbage haul fees or generate income through the sale of scrap metal and old equipment.
• All waste should be stored in a temporary waste storage area with pollution prevention measures and unwanted steel, sheet metal and equipment need to be stored in a demarcated salvage yard.
• Ensure hazardous materials are stored in suitable hazardous material storage facilities constructed from impermeable materials and removed from site for recycling by a reputable company.
• Mobile generators or fuel bowser to be supplied with bunded facility or necessary pollution control measures (drip trays).
• Clean out content of oil traps and dispose of waste at registered and purpose designed landfill sites.
• Tyres to be returned to supplier or a company that uses old tyres for making door mats, shoes, swings, etc.
• Batteries to be return to supplier or dispose at a permitted hazardous waste facility.
• Fluorescent tubes to be collected in sealed containers and removed from site for disposal at a permitted hazardous waste facility.
• Chemical containers to be returned to supplier or disposed of at a legal, permitted facility that is capable of disposing of the waste. (DO NOT sell chemical containers to workers or communities).
• Laboratory waste (chemicals) - Returned to supplier or disposed of at a permitted facility that is capable of disposing of the waste. These liquid wastes cannot be disposed of on the

Site Access and Site Establishment - Impacts on topography	**Significance**	**Before**	**After**
No change in topography during Site Access and Site Establishment	**Nature**	Neutral	Neutral
Potetial impacts:	**Severity**		
None	**Spatial Scale**		
Indirect impacts:	**Duration**		
None	**Consequence**	NA	NA
Residual impacts:	**Probability**		
None	**Significance**	NA	NA
	Cumulative Effects		
	Reversibility		NA
	Degree to which the impact can be avoided, managed or mitigated:		NA

Mitigation

• None

Site Access and Site Establishment - Impacts on Terrestrial Ecology	Significance	Before	After
Due to the small scale of this prospecting project no new infrastructure will be developed and existing tracks will be utilised. The closure objective of historic mining operations was only to make the area safe with no regard to preparation of the area for revegetation and therefore natural rehabilitation of the transformed areas due to trenches are very slow and is further hampered by the continuous use of the areas as campsites. During this operation the same areas will also be used for the mobile infrastructure like containers for secure storage and parking area for equipment. The environmental impact due to infrastructure areas will be the same as for the informal campsite during the easter and summer holidays.	**Nature**	Neutral	Neutral
	Severity		
	Spatial Scale		
	Duration		
	Consequence	NA	NA
	Probability		
Potential impacts:	**Significance**	NA	NA
Refer Operational Phase	**Cumulative Effects**		
Indirect impacts:			
Refer Operational Phase	**Reversibility**		Reversible
Residual impacts:	**Degree to which the impact can be avoided, managed or mitigated:**		Medium
Refer Operational Phase			
Mitigation • Mitigation measures for Soil (contamination, erosion, compaction) & Land capability will also be applicable to promote natural revegetation: • Provide all workers with environmental awareness training. • Ensure all workers comply with the requirements of the EMPr.			
Site Access and Site Establishment - Impacts on Aquatic Ecology & Water Resources	**Significance**	**Before**	**After**
Potable water from the Municipality will be trucked in and stored in water tanks. Sea water will be pumped from the inter-tidal zone and used (with recycling) for processing of materials when and if processing is required. There are no permanent surface water features on site that could be impacted on.	**Nature**	Negative	Negative
	Severity	2	1
	Spatial Scale	1	1
Potential impacts:	**Duration**	2	1
Potential contamination of groundwater from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.	**Consequence**	5	3
Accidental spills not cleaned up immediately.	**Probability**	2	2
Indirect impacts:	**Significance**	10	6
Rainfall is very seldom and evaporation rate is very high.	**Cumulative Effects**	Insignificant	Insignificant
Indirect impacts on surface water are very unlikely.			
Residual impacts:	**Reversibility**		Reversible
None	**Degree to which the impact can be avoided, managed or mitigated:**		High

Mitigation

• No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998) without the necessary permission. Potable and process water to be obtained from legal source and brought on site.

• Prevent any invasive prospecting activities within 100m from a water course with clear demarcation of access areas within the 100m buffer of estuaries.

• A Water Use Authorisation (License or GA) in terms of Sec 21 of the NWA for Impeding or diverting the flow of water in a watercourse (Sec 21c) and Altering the Bed, Banks, Course or Characteristics of a Watercourse (Sec 21i) is required for sampling within, or within 100m of wetlands.

• Provide mobile ablution facilities and take care that temporary onsite sanitation facilities are well maintained and serviced regularly.

• Draw-up and strictly enforce procedures for the storage, handling and transport of different hazardous materials and ensure that good housekeeping rules are applied.

• Ensure vehicles and equipment are in good working order and drivers and operators are properly trained. Place oil traps under stationary machinery, only re-fuel machines at fuelling station, construct structures to trap fuel spills at fuelling station, immediately clean oil and fuel spills and dispose contaminated material (soil, etc.) at licensed sites only.

• Minimise storage of hazardous substances onsite during construction.

• Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling.

• Plan for the management of water runoff during infrequent but potentially destructive storms.

• Storm water diversion and erosion control contour berms will separate clean and contaminated water systems around the pit and infrastructure areas.

• Slow storm water runoff with contoured, low-gradient drains and channels and although erosion and runoff are natural processes it should be managed by maintaining maximum existing vegetation coverage.

• Allow for the dissipation of runoff into the surrounding veld from multiple side drains, rather than for the concentration of flows along or off the road in major channels.

• Install pipe culverts or similar at the road crossing points to allow for the uninterrupted flow of water under / across the road.

• By keeping contaminated and clean water separate and establishing controlled runoff, the flow and end destination of decontamination washing water will be controlled.

Site Access and Site Establishment - Impacts on Marine Ecology	**Significance**	**Before**	**After**
No development will take place below the high-water mark	**Nature**	Neutral	Neutral
Potential impacts:	**Severity**		
Refer Operational Phase	**Spatial Scale**		
Indirect impacts:	**Duration**		
Refer Operational Phase	**Consequence**	NA	NA
Residual impacts:	**Probability**		
Refer Operational Phase	**Significance**	NA	NA
	Cumulative Effects		
	Reversibility		Reversible
	Degree to which the impact can be avoided, managed or mitigated:		Medium

Mitigation

Refer Operational Phase

Site Access and Site Establishment -Impacts from Emissions (Air Quality, Visual intrusion & Noise Generation)	Significance	Before	After
Caused by machinery and movement of trucks on site during preparation of site establishment.	**Nature**	Negative	Negative
Potential impacts:	**Severity**	2	1
Impaired human health from increased pollutant concentrations associated with construction activities	**Spatial Scale**	3	1
Increased dustfall from construction activities	**Duration**	1	1
Increased noise and vibration levels during construction	**Consequence**	6	3
Altered sense of place and visual intrusion caused by construction activities and from increased traffic during construction	**Probability**	4	2
Indirect impacts:	**Significance**	24	6
The site is flat, with views obstructed by low level vegetation in most places, effectively screening the interspersed sampling pits.	**Cumulative Effects**	Very low	Insignificant
Carbon emissions from vehicle exhausts have a negative impact on the ozone layer.	**Reversibility**		Reversible
Local residents along the access tracks and roads would be impacted on by noise, dust and vehicle emissions during the construction activities.	**Degree to which the impact can be avoided, managed or mitigated:**		High
Increase in Greenhouse Gas Emissions from vehicles.			
Residual impacts:			
Good housekeeping will ensure a neat and well-maintained construction area reducing visual impact.			
Carbon emissions have impact on climate change.			

Mitigation

• Separation distance of minimum 100m, but preferably 500m to be maintained between activities and inhabited dwellings and if not possible agreements with occupants needs to be put in place.

• Activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact of noise of neighbours. No amplified music shall be allowed on site. Engines shall be turned off when the vehicle is temporarily parked or stationery for long periods.

• On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. At the prospecting area a speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit.

• The wetting of the roads helps reduce dust generation as will applying dust suppression and/or hardening compound. Reduce airborne dust through dampening dust-generating areas, roads and stockpiles with seawater; and utilise screens in high dust-generating areas.

• Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material and incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces.

• Avoid excavation, handling and transport of materials which may generate dust under high wind conditions.

• Health and safety equipment is required for workers.

• Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions.

• Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material.

• The site shall be kept neat and tidy at all times and all activities, material and machinery contained within an area that is as small as possible and kept orderly.

• Rehabilitate disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the Construction Phase.

• Minimise the use of night-lighting. No high mast or spot-light security lighting or up-lighting allowed.

Site Access and Site Establishment - Impacts on Socio-economic features	Significance	Before	After
Potential Impacts:	**Nature**	Negative	Negative
Conflict with landowner and other land users	**Severity**	5	1
Creation of Employment with Local And Regional Economic Spin-Offs	**Spatial Scale**	5	1
Indirect impacts:	**Duration**	6	1
Upskilling	**Consequence**	16	3
Local economic spin-offs through increased income earned, and through purchasing of local materials	**Probability**	4	1
Income generation for landowners in a time of severe drought where livestock farming is not sustainable.	**Significance**	64	3
Residual impacts:	**Cumulative Effects**	Medium	Insignificant
The upliftment of unemployed people, with positive impact on standard of living for their families.			
Local and regional economic spin-offs.	**Reversibility**		Reversible
	Degree to which the impact can be avoided, managed or mitigated:		High

Mitigation

• All access will be arranged beforehand with landowner and a supervisor will be present at all times and will report to the landowner when accessing and leaving the property.

• Where required indemnity will be signed by all prospecting personnel entering the property to cover the landowner against any claims regarding injuries or damage to equipment.

• Any other mining companies or land users operating legally will be regarded as affected parties and consulted. Areas of operations will be demarcated and no overlapping will be allowed or agreements regarding environmental liabilities need to be put in place.

• Agreements between any existing mining operations or other land users and landowner will be respected and adopted as part of this operation, provided the right holder is effectively consultated on these agreements and their contents.

• Procure goods and services from local, provincial or South African suppliers as far as possible, with an emphasis on BEE suppliers.

• Maximise use of local skills and resources through preferential employment of locals where practicable.

• Provide ancillary training to workers on maximising the use of income and training to further future economic prospects, potentially through projects initiated as part of a social upliftment programme.

Site Access and Site Establishment - Impacts on Palaeontological, Archaeological and Cultural Heritage Resources	Significance	Before	After
Direct impacts to archaeological resources would occur primarily during the construction phase y (e.g. if mine machinery drives beyond the demarcated area during construction). **Potential Impacts:** Loss of archaeological resources, graves and precolonial cultural landscape The impact on paleontological resources are possible during all earthmoving activities. **Indirect impacts**: The material fossil evidence of "deep time" is embedded in the creation of the sacred landscape and contributes to the "sense of place" cultural aesthetic of the region. The loss of fossils and concomitant interpreted knowledge impoverishes the tangible testimony of the prehistoric landscape and ecological context of ancient humans. **Residual impacts:** Negative residual impact arises from the unavoidable loss of fossils of unknown significance in spite of mitigation efforts.	**Nature**	Negative	Negative
	Severity	5	1
	Spatial Scale	5	1
	Duration	6	1
	Consequence	16	3
	Probability	4	1
	Significance	64	3
	Cumulative Effects	Medium	Insignificant
	Reversibility		Irreversible
	Degree to which the impact can be avoided, managed or mitigated:		High

Mitigation

The impact can be avoided by ensuring that recommendations from specialist studies listed below are implemented.

• All the identified archaeological sites and their buffers must be avoided if possible;

• If avoidance of archaeological sites is not possible then they must be sampled by a qualified archaeologist under a permit issued by SAHRA/HWC;

• If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

• Regardless of the above archaeological opinion, all sampled sites should be carefully inspected by project staff to ensure that no heritage features are present and a fossil Chance Finds Procedure must be implemented in the event of any chance finds of fossils, and if any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted.

• Any identified heritage feature will be cordoned off with stakes and Chevron tape. All personnel including contractors involved in the construction activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them.

• Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed.

• The best mitigating measure is to try and avoid as many archaeological sites as possible, so mitigation as described here will only be required for those sites that cannot be avoided. Management measures are also required like careful planning by the developer of the project layout. Maps should be prepared showing all areas that will require disturbance.

Operational Phase - Impacts on other land uses	**Significance**	**Before**	**After**
Development incentives, restrictions, exclusions or prohibitions and their implications are not applicable to mining operations as the state is the custodian of all minerals and is responsible for the screening process as part of the acceptance process of applications taking into account any section 53 applications by other land users. Initial prospecting will concentrate within the coastal zone and Portion 1 of the Farm Karoetjies Kop belonging to the State and the only land use is uncontrolled recreational activities with ad hoc campsites during the crayfish season. Most of the tracks to be used were developed as a result of these informal camping. **Potential Impacts:** Conflict with recreational activities (informal campsites) during holiday seasons. Reduced access to the coast Conflict regarding environmental responsibilities with other mining companies operating in the same area. **Indirect impacts:** Possible decline of tourism **Residual impacts:** Recycling of waste material creates employment.	**Nature**	Negative	Positive
	Severity	2	1
	Spatial Scale	3	2
	Duration	3	2
	Consequence	8	5
	Probability	3	2
	Significance	24	10
	Cumulative Effects	Very Low	Insignificant
	Reversibility		Reversible
	Degree to which the impact can be avoided, managed or mitigated:		High

Mitigation

• Implement management measures (e.g. road signs, speed limits, etc.) to ensure that the public is still able to safely use the coastal route.

• Sampling to occur only during weekdays and sampling activities will occur continuously until such time that sample is completed and area rehabilitated, with no operations during the night.

• Alternative time frames can be made to ensure that the impact on the day to day running of the inherent land use are minimised, for example sampling can be scheduled not to coincide with the summer and easter holidays when the area is utilized by the local community as informal camp sites.

• Avoid beach sampling near “tourist” beaches during peak holiday season (Easter and Christmas holidays) and all unsafe areas rehabilitated or cordoned off to allow for open access during these periods.

• Prospecting activities will be conducted during daylight hours to minimize exposure to light and noise pollution.

• To mitigate conflict with recreational activities all prospecting activities will cease during peak holiday season

Operational Phase - Impacts on Soil (contamination, erosion, compaction) & Land capability	Significance	Before	After
This region is not suited to the production of arable agricultural products owing to the low rainfall. Consequently, there is no record of any form of agricultural production in the study area. With the limited extend of invasive prospecting activities (<5Ha) the proposed prospecting activities will not lead to a loss of agricultural production (grazing).	**Nature**	Negative	Negative
	Severity	4	2
	Spatial Scale	1	1
Potential Impacts:	**Duration**	3	1
The clearing of areas for new overburden and topsoil stockpiles with movement areas will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall.	**Consequence**	8	4
	Probability	4	4
Potential contamination of soil from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances. Accidental spills not cleaned up immediately.	**Significance**	32	16
Loss of land capability	**Cumulative Effects**	Low	Very low
Indirect impacts:	**Reversibility**		Reversible
Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning.	**Degree to which the impact can be avoided, managed or mitigated:**		Medium
Dust impacting on adjacent vegetation and causing a nuisance to workers or residents.			
Compaction of topsoil where vehicles drive outside demarcated areas damages seed bank and habitat for invertebrates.			
Residual impacts:			
Potential loss of invertebrates that live in the top layers of the soil.			

Mitigation

The same mitigating measures as for Site Access and Site Establishment will be applicable as well as the following:

- Any stockpiles left or oversize boulders must be removed and used to backfill excavations and or sumps.
- Spoils to be used as backfill or landscaping or otherwise dealt with responsibly.
- Although erosion and runoff are natural processes it should be managed by maintaining topsoil in any areas not in use and maintaining maximum vegetation coverage.
- Implement drainage control measures and culverts to manage the natural flow of surface runoff around the development area.
- Reduce drop height of material to a minimum and temporarily halt material handling in windy conditions.
- A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit.
- Soil erosion on haul roads is to be regularly monitored and repaired.
- Tailings and overburden may only be located on the excavated pit to reduce impacts on undisturbed areas.
- Contaminated soil must be treated by first removing the source of contamination - removing the source of contamination should allow the system to recover without further clean-up required.
- Petrochemical spillages to be collected in a container and store excavated spill affected soil for disposal at a registered facility or onsite treatment.
- Ensure hazardous materials are stored in suitable hazardous material storage facilities constructed from impermeable materials. Fuel storage must be contained in mobile bowsers and refuelling will be done with care to minimise the chance of spillages
- The most promising techniques for in on-site treatment involve bioremediation. Bioremediation involves the use of microorganisms to destroy hazardous contaminants.
- Compacted areas that are not required for access shall be scarified after use as part of the annual rehabilitation plan. Undertake concurrent rehabilitation to prevent stockpiled topsoil from losing its inherent fertility.

Operational Phase - Potential Impacts on topography	Significance	Before	After
With mitigation the change in topography from prospecting activities would be slight depressions created in the landscape. On the beach the topography will be reinstated after the first high water or storm event.	**Nature**	Negative	Negative
	Severity	2	1
Potential impacts:	**Spatial Scale**	1	1
Change in topography due to excavations and overburden dumps if not backfilled.	**Duration**	1	1
Indirect impacts:	**Consequence**	4	3
None	**Probability**	6	1
Residual impacts:	**Significance**	24	3
Very slight visual change in landscape and topography following rehabilitation.	**Cumulative Effects**	Very low	Insignificant
	Reversibility		Reversible
	Degree to which the impact can be avoided, managed or mitigated:		Medium

Mitigation

• All spoils need to be returned to the excavations for backfilling.

• Pit development will be the same as for trench development (Bulk Sampling), but on a much smaller scale and the dimensions provided must not be exceeded.

• There will only ever be three prospecting pits open at any given time, one in the process of rehabilitation, one that is operational and one in the process of development and it is anticipated that no more than 20 such pits will be developed.

• After results are logged the pit will be backfilled immediately for security and safety reasons before the project is moved to the next pit position. In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation.

Operational Phase - Impacts on Terrestrial Ecology	Significance	Before	After
The overall abundance of Flora SCC is low and there will be no significant impact as work above the high-water mark will concentrate around transformed areas. Studies also show there is no discernible difference in Faunal community structure and composition inside and outside of development areas and the resident fauna appears to be tolerant of mining activities and did not avoid the mining areas to a significant degree. Studies has shown that the study area is fairly homogenous and similar habitat is broadly available in the area. The major impact on Terestrial ecology from the current development is likely to be the temporary loss of less than 5 Ha coastal habitat, which is of local but not broader significance. Less than 5Ha will temporary be disturbed by sampling and will mainly cover the area below the high-water mark and transformed areas. The project will have a medium significant impact regarding Terestrial ecology due to the small areas to be disturbed and short duration of activities.	**Nature**	Negative	Negative
	Severity	5	2
	Spatial Scale	1	2
	Duration	3	2
	Consequence	9	6
	Probability	6	2
	Significance	54	12
	Cumulative Effects	Medium	Very low
Potential impacts:	**Reversibility**		Reversible
Destruction of sensitive ecosystems and habitats for species of conservation concern (SCC). The clearing of areas for invasive sampling will result in the removal of existing vegetation and plant SCC Disturbance to terrestrial fauna Disturbance to avifauna Proliferation of alien and invasive species during prospecting	**Degree to which the impact can be avoided, managed or mitigated:**		Medium
Indirect impacts:			
Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation. Removal of alien invasive vegetation is a positive impact, and will benefit the ecological functioning.			
Residual impacts:			
Parts of the project area has been heavily impacted by historic mining and recreational activities.			

Mitigation

- Mitigation measures for Soil (contamination, erosion, compaction) & Land capability will also be applicable to promote natural revegetation:
- The sampling sites will be informed by the findings of non- invasive prospecting and must be clearly demarcated, and no activities may take place outside of demarcated areas.
- Movement of vehicles and machinery will be restricted to demarcated areas and roads with no off-road driving permitted. Vehicles speed must take into account the possibility of collisions with fauna.
- Appoint a suitably qualified specialist to undertake a presampling walk-through to identify SCC and protected species and oversee the rescue and relocation of these species.
- Flush any faunal species within the development footprint towards more suitable habitat within the surrounding areas and check for nests during the presampling walk-through.
- Erect wind screens along beach access roads in areas of mobile sands to limit and contain wind-blown sand.
- Where removal of vegetation cannot be avoided areas should be kept to an absolute minimum and only clear vegetation when a new area is to be excavatedand. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. Remove the vegetation and topsoil simultaneously and, where possible, immediately place this material in an area prepared for rehabilitation to reduce the duration of topsoil storage.

Enforce a 10 m buffer zone from the toe of the sand dunes and cliffs towards the sea in which no disturbance may take place.

- Do not leave excavations open for extended periods. After results are logged the pit will be backfilled immediately for security and safety reasons before the project is moved to the next pit position. In case of sudden closure of the project there will only be one open pit to be dealt with as part of final decommissioning and rehabilitation.
- Obtain a permit from CapeNature for the removal / destruction of SCC.
- Prohibit trapping, collecting and hunting of fauna.
- Keep the construction site clear of litter and especially plastic, twine and string.
- Undertake regular monitoring for alien plants and conduct regular alien clearing using the best-practice methods for the species concerned. Avoid using herbicides as far as possible

Operational Phase - Impacts on Aquatic Ecology & Water Resources	Significance	Before	After
Potable water from the Municipality will be trucked in and stored in water tanks. Sea water will be pumped from the inter-tidal zone and used (with recycling) for processing of materials when and if processing is required. There are no permanent surface water features on site that could be impacted on.The Sout River classified as a NFEPA River (FEPA 3) and estuary is present close to the prospecting area.	**Nature**	Negative	Negative
	Severity	2	1
	Spatial Scale	1	1
Potential impacts:	**Duration**	2	1
Potential contamination of groundwater from unmanaged use of hydrocarbons on-site, and incorrect storage of hazardous substances.	**Consequence**	5	3
Accidental spills not cleaned up immediately.	**Probability**	2	2
Indirect impacts:	**Significance**	10	6
Rainfall is very seldom and evaporation rate is very high.	**Cumulative Effects**	Insignificant	Insignificant
Indirect impacts on surface water are very unlikely.	**Reversibility**		Reversible
Residual impacts:	**Degree to which the impact can be avoided, managed or mitigated:**		High
None			
Mitigation			
The same mitigating measures as for Site Access and Site Establishment will be applicable especially waste management.			

Operational Phase - Impacts on Marine Ecology	Significance	Before	After
Increased sand movement due to disturbance caused by access roads as well as increased sand input from the beaches due to beach mining activities would potentially affect this community. As sandy beaches are highly dynamic, these habitats are less sensitive to disturbance than rocky shore environments. Sandy beaches are also quicker to recover from disturbance than rocky habitats, with recovery from intensive mining operations being found to occur within two to three years. Relatively few species occur on sandy beaches in comparison to rocky shores due to the unstable and harsh nature of beaches.	**Nature**	Negative	Negative
	Severity	5	2
	Spatial Scale	1	2
	Duration	3	2
	Consequence	9	6
Sampling activities will have a medium significant impact on these species due to the small areas to be disturbed and short duration of activities. Mitigation of the disturbance is also possible and after mitigation the impact will be regarded as low significance. It must also be noted that less than 5 Ha mainly sandy beaches will temporary be disturbed by sampling.	**Probability**	6	2
	Significance	54	12
	Cumulative Effects	Medium	Very low
Potential impacts:	**Reversibility**		Reversible
Shoreline erosion and altered beach profiles caused by beach mining	**Degree to which the impact can be avoided, managed or mitigated:**		High
Changes in macrofaunal community structure caused by beach mining			
Disturbance and/or mortality of marine life during sampling and beach access roads as well as mine waste			
Smothering of reefs and macrofauna caused by increased sedimentation from beach mining			
Increased turbidity in the water column during beach mining			
Disturbance to avifauna and loss of habitat during mining			
Indirect impacts:			
Conflict with recreational activities			
Conflict with kelp collectors			
Residual impacts:			
None			

Mitigation
• Enforce a 10 m buffer zone from the toe of the sand dunes and cliffs towards the sea in which no mining or disturbance may take place.
• Undertake primary processing on the beach and distribute tailings evenly above the mid-line of the beach from where it was mined.
• Actively backfill mined beaches and profile the mining area to resemble the natural beach profile.
• Prohibit vehicle maintenance and refuelling on the beach. Park vehicles / machinery on beach access roads rather than on the beach when not in use.
• Prohibit mining closer than 10 m to rocky shore habitats
• Undertake bird counts at regular roosting sites
• Inform all staff about sensitive marine species and the responsible disposal of waste.
• Do not dispose of any waste in the marine environment

Operational Phase - Impacts from Emissions (Air Quality, Visual intrusion & Noise Generation)	**Significance**	**Before**	**After**
Caused by machinery on site during invasive prospecting operations.	**Nature**	Negative	Negative
Potential impacts:	**Severity**	2	1
Impaired human health from increased pollutant concentrations associated with construction activities	**Spatial Scale**	3	1
Increased dustfall from construction activities	**Duration**	1	1
Increased noise and vibration levels during construction	**Consequence**	6	3
Altered sense of place and visual intrusion caused by construction activities and from increased traffic during construction	**Probability**	4	2
Indirect impacts:	**Significance**	24	6
Refer Site Access and Site Establishment	**Cumulative Effects**	Very low	Insignificant
Residual impacts:			
Refer Site Access and Site Establishment	**Reversibility**		Reversible
	Degree to which the impact can be avoided, managed or mitigated:		Medium

Mitigation
The same ass for Site Access and Site Establishment

Operational Phase - Impacts on Socio-economic features	Significance	Before	After
Potential Impacts:	**Nature**	Negative	Negative
Conflict with landowner and other land users	**Severity**	5	1
Creation of Employment with Local And Regional Economic Spin-Offs	**Spatial Scale**	5	1
Indirect impacts:	**Duration**	6	1
Upskilling	**Consequence**	16	3
Local economic spin-offs through increased income earned, and through purchasing of local materials	**Probability**	4	1
Income generation for landowners in a time of severe drought where livestock farming is not sustainable.	**Significance**	64	3
Residual impacts:	**Cumulative Effects**	Medium	Insignificant
The upliftment of unemployed people, with positive impact on standard of living for their families.			
Local and regional economic spin-offs.	**Reversibility**		Reversible
	Degree to which the impact can be avoided, managed or mitigated:		High

Mitigation

• All access will be arranged beforehand with landowner and a supervisor will be present at all times and will report to the landowner when accessing and leaving the property.
• Where required indemnity will be signed by all prospecting personnel entering the property to cover the landowner against any claims regarding injuries or damage to equipment.
• Any other mining companies or land users operating legally will be regarded as affected parties and consulted. Areas of operations will be demarcated and no overlapping will be allowed or agreements regarding environmental liabilities need to be put in place.
• Agreements between any existing mining operations or other land users and landowner will be respected and adopted as part of this operation, provided the right holder is effectively consultated on these agreements and their contents.
• Maximise use of local skills and resources where practicable.
• Provide ancillary training to workers on maximising the use of income and training to further future economic prospects.

Operational Phase - Impacts on Paleontological, Archaeological and Cultural and Heritage Resources	Significance	Before	After
Direct impacts to archaeological resources would occur primarily during the construction phase y (e.g. if mine machinery drives beyond the demarcated area during construction). **Potential Impacts:** Loss of maritime archaeological resources during beach mining Loss of archaeological resources, graves and precolonial cultural landscape The impact on paleontological resources are possible during all earthmoving activities. **Indirect impacts**: The material fossil evidence of "deep time" is embedded in the creation of the sacred landscape and contributes to the "sense of place" cultural aesthetic of the region. The loss of fossils and concomitant interpreted knowledge impoverishes the tangible testimony of the prehistoric landscape and ecological context of ancient humans. **Residual impacts:** Negative residual impact arises from the unavoidable loss of fossils of unknown significance in spite of mitigation efforts. Positive residual impact arises from the successful rescue of fossil material for posterity, resulting in material for future research, employment opportunities for budding, young researchers and enhanced insights into the prehistory of the area.	**Nature**	Negative	Negative
	Severity	5	1
	Spatial Scale	5	1
	Duration	6	1
	Consequence	16	3
	Probability	4	1
	Significance	64	3
	Cumulative Effects	Medium	Insignificant
	Reversibility		Irreversible
	Degree to which the impact can be avoided, managed or mitigated:		High

Mitigation

The impact can be avoided by ensuring that recommendations from specialist studies listed below are implemented.

- All the identified archaeological sites and their buffers must be avoided if possible;
- If avoidance of archaeological sites is not possible then they must be sampled by a qualified archaeologist under a permit issued by SAHRA/HWC;
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
- Regardless of the above archaeological opinion, all sampled sites should be carefully inspected by project staff to ensure that no heritage features are present and a fossil Chance Finds Procedure must be implemented in the event of any chance finds of fossils, and if any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted.
- Any identified heritage feature will be cordoned off with stakes and Chevron tape. All personnel including contractors involved in the construction activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them.
- Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed.
- The best mitigating measure is to try and avoid as many archaeological sites as possible, so mitigation as described here will only be required for those sites that cannot be avoided.

Management measures are also required like careful planning by the developer of the project layout. Maps should be prepared showing all areas that will require disturbance.

Decommissioning and closure - Impacts on other land uses	Significance	Before	After
Due to the small scale of this prospecting project no new infrastructure will be developed and existing tracks will be utilised. The environmental impact due to infrastructure areas will be the same as for the informal campsite during the easter and summer holidays. **Potential Impacts:** Reduced access to the coast **Indirect impacts:** None **Residual impacts:** None	**Nature**	Negative	Positive
	Severity	2	1
	Spatial Scale	1	1
	Duration	1	1
	Consequence	4	3
	Probability	2	2
	Significance	8	6
	Cumulative Effects	Insignificant	Insignificant
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		High

Mitigation

• Restrict closure / closure activities to the affected footprint. Install appropriate signage and information regarding coastal access

• Dual use access roads must be handed back to the landowner in a good state of repair.

• Implementing screening as part of the cleaning activities before materials are moved from the mine. The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned. Any compacted movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled.

• Redundant structures will be removed for use elsewhere or demolished and discarded.

• All steel structures and reinforcing will be discarded or sold as scrap. All equipment and other items used during the prospecting operation needs to be removed from the site.

• Remove all power and water supply installations not to be retained by landowner in terms of section 44 of the MPRDA.

• Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site.

Decommissioning and closure - Potential Impacts on Soil (contamination, erosion, compaction) & Land capability	Significance	Before	After
Implementation of Rehabilitation, Decommissioning and Mine Closure Plan **Potential Impacts:** None **Indirect impacts:** None. **Residual impacts:** Increase in natural habitat following rehabilitation processes.	**Nature**	Positive	Positive
	Severity		
	Spatial Scale		
	Duration		
	Consequence	0	0
	Probability		
	Significance	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		

Decommissioning and closure - Impacts on topography	Significance	Before	After
Implementation of Rehabilitation, Decommissioning and Mine Closure Plan	**Nature**	Positive	Positive
Potential Impacts:	**Severity**		
None	**Spatial Scale**		
Indirect impacts:	**Duration**		
Historic disturbances rehabilitated	**Consequence**	0	0
Residual impacts:	**Probability**		
Increase in natural habitat following rehabilitation processes.	**Significance**	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		

Mitigation

• All mitigation will be addressed as part of the annual rehabilitation plan as part of the operational phase.

• The focus of topographic rehabilitation may not be obvious at the time of mine planning and must be addressed as the mine develops and the Final Rehabilitation, Decommissioning and Closure Plan must be reviewed periodically for continued relevance in the light of changed prospecting path or long-term plans.

Decommissioning and closure - Impacts on Terrestrial Ecology	Significance	Before	After
Implementation of Rehabilitation, Decommissioning and Mine Closure Plan	**Nature**	Positive	Positive
Potential Impacts:	**Severity**		
Disturbance to terrestrial fauna during closure	**Spatial Scale**		
Soil compaction slowing natural re-vegetation will result from ongoing repeated use of movement areas and driving off-road.	**Duration**		
Indirect impacts:	**Consequence**	0	0
Removal of alien invasive vegetation is a positive impact, and will benefit the ecological functioning.	**Probability**		
Residual impacts:	**Significance**	0	0
Increase in natural habitat following rehabilitation processes.	**Cumulative Effects**		
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		

Mitigation

• All outstanding rehabilitation not completed as part of the Annual Rehabilitation plan needs to be completed as part of the final Rehabilitation, Decommissioning and Mine Closure Plan

• Prohibit the indiscriminate movement of vehicles and staff through vegetation outside of the affected footprint.

Decommissioning and closure - Impacts on Aquatic Ecology & Water Resources	Significance	Before	After
Implementation of Rehabilitation, Decommissioning and Mine Closure Plan	**Nature**	Positive	Positive
Potential Impacts:	**Severity**		
Groundwater contamination during closure of the infrastructure / plant	**Spatial Scale**		
Indirect impacts:	**Duration**		
None	**Consequence**	0	0
Residual impacts:	**Probability**		
None	**Significance**	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		
Mitigation • Remove all hazardous materials from site and dispose at a licensed waste disposal facility. • Do not bury any materials on site. • Collect and dispose of polluted soil at a licensed waste disposal facility. • Remove or shape graded vegetation and soils along the road edges.			
Site Access and Site Establishment - Impacts on Marine Ecology	**Significance**	**Before**	**After**
Implementation of Rehabilitation, Decommissioning and Mine Closure Plan	**Nature**	Positive	Positive
Potential impacts:	**Severity**		
None	**Spatial Scale**		
Indirect impacts:	**Duration**		
None	**Consequence**	0	0
Residual impacts:	**Probability**		
None	**Significance**	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		
Mitigation None			

Decommissioning and closure - Impacts from Emissions (Air Quality, Visual intrusion & Noise Generation)	Significance	Before	After
None during decommissioning activities or less than for operational phase	**Nature**	Neutral	Neutral
Potential Impacts:	**Severity**		
Altered sense of place and visual intrusion caused by closure and rehabilitation activities	**Spatial Scale**		
Indirect impacts:	**Duration**		
None	**Consequence**	0	0
Residual impacts:	**Probability**		
None	**Significance**	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		

Mitigation

- Use dark green or black (non-glossy) wind screens.
- Remove rehabilitation wind screens as soon as vegetation is viable.

Decommissioning and closure - Impacts on Socio-economic features	Significance	Before	After
Potential Impacts:	**Nature**	Negative	Negative
Staff losing their jobs	**Severity**	4	4
Contractual agreements with service providers surpassing mine closure date	**Spatial Scale**	3	3
Poorly defined transition from mining to farming activities within different legislation	**Duration**	3	3
Not undertaking environmental management according to approved EMPr and plans and no auditing of the environmental management	**Consequence**	10	10
system.	**Probability**	3	3
Insufficient funds for complete rehabilitation	**Significance**	30	30
Indirect impacts:	**Cumulative Effects**	Low	Low
Job losses of secondary industries, businesses and contractors			
Mine closure stalled due to non-compliance with South African legislation (national, provincial and local)	**Reversibility**		Irreversible
Residual impacts:	**Degree to which the impact can be avoided, managed or mitigated:**		Medium
Closure standards not accepted and/or are changing Mine closure being jeopardised by other land uses			

Mitigation

- Contract durations with service providers will be limited to address the risk of contractual agreements with service providers surpassing the mine closure date.
- Maintain positive and transparent relationships with stakeholders and maintaining communication channels.
- Undertaking environmental management in accordance with the approved EMPr and Closure Plan.

Decommissioning and closure - Impacts on Paleontological, Archaeological and Cultural and Heritage Resources	Significance	Before	After
None during decommissioning activities or less than for operational phase	**Nature**	Neutral	Neutral
Potential Impacts:	**Severity**		
None	**Spatial Scale**		
Indirect impacts:	**Duration**		
None	**Consequence**	0	0
Residual impacts:	**Probability**		
None	**Significance**	0	0
	Cumulative Effects		
	Reversibility		
	Degree to which the impact can be avoided, managed or mitigated:		
Mitigation			
None			

14 Environmental impact statement

14.1 Summary of the key findings of the environmental impact assessment

The majority of the prospecting activities are non-invasive and hence will have no environmental or social impact. The invasive activities will only entail sampling by means of small prospecting pits which will have a minimal environmental and social impact.

The total anticipated area for disturbance is anticipated at less than 5Ha which need to be viewed in the context of the entire prospecting area under application which covers 412Ha.

The assessed impact ratings after implementation of the mitigation measures described above are as follows:

Site Access and Site Establishment

- Impacts on other land uses = very low significance, reducing to insignificant:
- Impacts on Soil (contamination, erosion, compaction) & Land capability = low significance, reducing to very low:
- Change in Topography = none
- Impacts on Terrestrial Ecology = none
- Impacts on Aquatic Ecology & Water Resources = insignificant
- Impacts on Marine Ecology = none
- Impacts from Emissions (Air Quality. Visual intrusion & Noise Generation = very low significance, reducing to insignificant
- Impacts on Palaeontological. Archaeological and Cultural Heritage Resources = medium significance, reducing to insignificant;
- Socio - economic impact = medium significance, reducing to insignificant.

Operational Phase

- Impacts on other land uses = very low significance, reducing to insignificant:
- Impacts on Soil (contamination, erosion, compaction) & Land capability = low significance, reducing to very low:
- Change in Topography = very low significance, reducing to insignificant:
- Impacts on Terrestrial Ecology = medium significance, reducing to very low significance;
- Impacts on Aquatic Ecology & Water Resources = insignificant
- Impacts on Marine Ecology = medium significance, reducing to very low significance;
- Impacts from Emissions (Air Quality. Visual intrusion & Noise Generation = very low significance, reducing to insignificant;
- Impacts on Palaeontological. Archaeological and Cultural Heritage Resources = medium significance, reducing to insignificant;
- Socio - economic impact = medium significance, reducing to insignificant.

Decommissioning Phase

- Impacts on other land uses = insignificant positive;
- Impacts on Soil (contamination, erosion, compaction) & Land capability = positive;
- Change in Topography = positive:
- Impacts on Terrestrial Ecology = positive;
- Impacts on Aquatic Ecology & Water Resources = positive;
- Impacts on Marine Ecology = positive;
- Impacts from Emissions (Air Quality. Visual intrusion & Noise Generation = none:
- Impacts on Palaeontological. Archaeological and Cultural Heritage Resources = none:
- Socio - economic impact - low negative.

All of the identified impacts will occur for a limited period and the extent of the impacts will be localised. All the identified impacts can be suitably mitigated with the residual impact ratings being of insignificant. The main impacts associated with the sampling activities (site

disturbance) can be suitable mitigated. After sampling activities have been completed and the excavations backfilled and rehabilitated to pre-prospecting status, the impacts will cease to exist

14.2 Final Site Map

Please refer to **Figure 1 to 25** for the Environmental Sensitivities Map

14.3 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

14.3.1 Positive Impacts

This application is for prospecting activities. Should favourable results be obtained from exploration, and it is believed that mining will be economically viable; such mining would contribute to one of the main employment sectors of the Local Municipality. The prospecting activities themselves would not directly lead to job opportunities.

14.3.2 Negative Impacts

- Surface water and groundwater contamination from hydrocarbons during the construction/set-up and operational activities which include earth moving equipment operation and use of vehicles on site; and
- Wildlife and vegetation disturbance from sample site preparation during the construction / set-up and operational phase as contractors rehabilitate one site and move to the next site and prepare it;
- Dust fall & nuisance from construction / excavations, Visual intrusion caused by the excavation activities in the largely rural setting and Noise Generation from construction / set-up and operational activities of sampling;
- Socio-Economic impact due to conflicting land uses during the construction / set-up and operational phase.

14.4 Proposed impact management objectives and the impact management outcomes

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan prospecting activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management and closure plan that is effective and practical for implementation.
- Through the implementation of the proposed mitigation measures it is anticipated that the identified social & environmental impacts can be managed and mitigated effectively.
- Surface water and groundwater contamination by hydrocarbons can be managed by conducting proper vehicle maintenance, refuelling with care to minimise the chance of spillages and by having a spill kit available on each site where prospecting activities are in progress;
- Wildlife disturbance and clearance of vegetation at sample areas will be limited to the absolute minimum required and disturbed areas will be prepared to facilitate natural re-vegetation with locally indigenous species as soon as possible;
- Dust fall can be managed by reducing driving speeds when driving on unpaved roads;
- Visual intrusion can be managed through consultation with landowners /stakeholders;
- Noise generation can be managed through consultation and restriction of operating hours and by maintaining equipment and applying noise abatement equipment if necessary;
- Through the implementation of the mitigation and management measures it is expected that: Heritage/cultural resources can be managed by avoidance of known resources and

through consultation with landowners/stakeholders. Contractor personnel will also be briefed of these sensitivities and consequences of any damage/removal of such features;
- Socio - economic impact can be managed by employing strong, experienced personnel with proven skills in public consultation and conflict resolution during stakeholder consultation phases. All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and that they treat local residents with respect and courtesy at all times.

14.5 Description of any assumptions, uncertainties, and gaps in knowledge.

This report has been completed to the best of the EAPs ability, based on his experience and on information currently available to the EAP as well as provided by the applicant.

Comment received on the draft BAR was reviewed and incorporated into the final BAR. As such, the public perception of the proposed activity was known. In addition, comments and inputs received from the authorities and public provided additional information which were considered.

Mitigation measures are proposed which are considered to be reasonable and must be implemented in order for the outcome of the assessment to be accurate.

The location of sample sites is not yet known and will be identified through the phased approach of the prospecting programme. This assessment is therefore based on a desktop approach at a broad scale and assuming that sampling could occur anywhere around the anomalies identified for this programme.

In addition, landowners will be re-engaged at this stage to communicate the company's intent to progress to sampling and to discuss the proposed sampling activities and identified locations with the registered I&APs at that point in time.

14.6 Reasoned opinion as to whether the proposed activity should or should not be authorized

14.6.1 Reasons why the activity should be authorized or not.

It is the opinion of the EAP that the proposed prospecting activities should be authorised. In reaching this conclusion the EAP has considered that;

- Based on historical prospecting results, there is a good possibility of encountering mineral deposits in the area
- The exploration program will be developed in a stepwise manner commencing with non-invasive activities to bring refinement to understanding of the geological anomaly.
- Should the exploration program advance to include the need for sampling, the environmental impacts associated with the limited activities are deemed to be insignificant provided that the proposed mitigation is implemented;
- The spatial extent of the physical impact is less than 5Ha over a prospecting right application area of 412 hectares;
- With appropriate care and consideration, the impacts resulting from sampling can be suitably avoided, minimised or mitigated and even reversed;
- Without implementation of prospecting activities, the knowledge concerning the potential mineral resource within the prospecting right area will not be confirmed.

14.6.2 Conditions that must be included in the authorisation

It is the opinion of the EAP that the following conditions should form part of the authorisation:

- Maintain a buffer of 100m from a water course;
- Maintain a minimum 100m (preferably 500m) buffer from any infrastructure or dwelling;
- Landowners and land occupiers should be engaged (re-consulted) at least 1 month prior to any site activities being undertaken once sample sites are known.

14.6.3 Period for which the Environmental Authorisation is required.
The authorisation is required for the duration of the prospecting right which is an initial 5 years plus a potential to extend the right by an additional 3 years. Normally there is also a time delay in the granting of applications for renewal therefore a total period of 10 years may be required.

14.6.4 Undertaking
An undertaking is provided at the end of this report.

15 Financial Provision

15.1 Legal Framework
Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations under section 44, read with sections 24 of the National Environmental Management Act, 1998 (Act No.107 of 1998) were issued in 2015.
According to the Financial Provisioning regulations, 2015 as amended regulation 7 the applicant or holder of a right or permit must ensure that the financial provision is, at any given time, equal to the sum of the actual costs of implementing the plans and report contemplated in regulation 6 and regulation 11.
In terms of regulation 11(1) the holder of a right or permit must ensure that a review is undertaken of the requirements for (a) annual rehabilitation, as reflected in an annual rehabilitation plan; (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations as reflected in a final rehabilitation, decommissioning and mine closure plan; and (c) remediation of latent or residual environmental impacts which may become known in the future, as reflected in an environmental risk assessment report.

15.2 Calculation
Financial provision in terms of Regulation 6 of the Financial Provisioning Regulations, 2015 as amended, is covered by the requirements for the actual costs of implementation of the measures required for final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations as reflected in the final rehabilitation, decommissioning and mine closure plan attached as Annexure 1.

15.3 Explain how the aforesaid amount was derived.
According to regulation 6 an applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for— (a) annual rehabilitation, as reflected in an annual rehabilitation plan; (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and (c) remediation of latent or residual environmental impacts which may become known in the future, as reflected in an environmental risk assessment report (Refer Annexure 1).

15.4 Confirm that this amount can be provided for from operating expenditure.
The amount needed for the implementation of the final rehabilitation, decommissioning and closure plan will be provided to DMR in the form of a bank guarantee and the plan will be revised on an annual basis in terms of regulation 11(1) of the NEMA Financial Provisioning Regulations 2015 as amended.

Provision for implementation of annual rehabilitation plan to be provided as part of the environmental audit report in terms of Regulation 34 (1)(b) of the NEMA EIA Regulations (2014) will be provided as part of the operational budget and proof of access to the necessary fund were provided as part of the PWP together with proof of access to the necessary financial resources.

16 Specific Information required by the competent Authority

16.1 Compliance with sections 24(4)(a) and (b) of NEMA

According to the National Environmental Management Act (Act 107 of 1998). the EIA report must include the impact on:

The socio-economic conditions of any directly affected person.

A full consultation process will be implemented during the environmental authorisation process. The purpose of the consultation is to provide affected persons the opportunity to raise any potential concerns. Concerns raised will be captured and addressed within the public participation section of this report to inform the decision-making process.

As the final positioning of the sample sites cannot be confirmed without completion of phase 1 of the prospecting work programme, a recommendation has been made to ensure that the directly affected landowners are re-consulted at least 1 month prior to any site activities being undertaken once sample sites are known. The purpose of the re-consultation is to allow for socio-economic impacts on directly affected persons to be raised and where possible addressed.

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

A HIA, UHIA and desktop PIA will be conducted by a suitably qualified specialist in order to identify any sensitive areas and resources of significance to be avoided when planning the sampling areas. All mitigating measures proposed in the specialist study was included as part of the EMPr.

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

A motivation for not investigating reasonable and feasible alternatives is provided in Section 8 above. The prospecting location has been informed by historical prospecting and production records for the area. The proposed prospecting activities requested as part of this authorisation is the only current viable manner in which a mineral resource can be evaluated to determine its economic viability.

17 Environmental Management Program

17.1 Details of the EAP,

This has already been covered. Refer Section 1 of this document

17.2 Description of the Aspects of the Activity

This has already been covered. Refer Section 3 of this document

17.3 Composite Map

This has already been covered. Refer Figure 1 & 2.

17.4 Description of Impact management objectives including management statements

The main management objectives for the invasive sampling activities are:

- Avoid potential impacts by positioning the sampling sites in a manner which avoids /minimise potential impacts. This can be achieved by implementing appropriate buffer zones;

- Reduce impacts through implementing realistic operational management measures such as imposing restrictions on the time of day when activities can take place and adherence to the site EMPr; and
- Ensure that chemical and hydrocarbon spillages are avoided, where they cannot all together be avoided minimised and mitigated.
- Establish appropriate waste management system
- Restore the physical impact of excavations through implementation of concurrent rehabilitation as and when sampling at one site is completed.

17.5 Determination of closure objectives.

- Objective 1 - To create a safe and healthy post-mining environment with no residual environmental impact.
  - Safe mining area
  - Limited residual environmental impact
- Objective 2 - To create a stable, free draining post mining landform, which is compatible with the surrounding landscape and which is capable of a productive land use that achieves a land capability equal to that of pre-prospecting conditions
  - Economically viable and sustainable land fit for grazing, as close as possible to its natural state.
- Objective 3 – To provide optimal post-mining social opportunities
  - Optimised benefits for the social environment
  - Minimal negative aesthetic impact

17.6 Volumes and rate of water use required for the operation.

No water will be required during this prospecting operation as no processing will take place on site. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998).

17.7 Has a water use license has been applied for?

NA refer above. The department responsible for water resources shall be consulted with regards to any water related concerns.

17.8 Impacts to be mitigated in their respective phases

Table 20: Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES Refer Table 19 for complete EIA with mitigation measures	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Non-invasive activities	Pre-Construction	412Ha	• All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution, including environmental coordinator where applicable. • All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area. • There will be a strict requirement to treat local residents with respect and courtesy at all times.	Environmental Awareness Plan	Before and during prospecting activities
Site Access - Access Roads (temporary, jeep track roads less than 4m wide)	Construction	±950m	• Existing farm roads and tracks must be used as far as possible; • Where new access tracks are required, such tracks must be scarified during decommissioning; • Vehicle's speed must take into account the possibility of collisions with fauna. • All compacted areas will be scarified and any topsoil stockpiled to be spread over the disturbed area.	Approved PWP Environmental Authorisation; NEMA Sec 2 Principles.	Upon cessation of the individual activity
Site establishment: - Demarcation of footprint for prospecting pits and overburden and topsoil dumps - Placement of temporary portable toilets and resting place.	Construction	88m² per sample site Max ±2000m² including equipment laydown area & Sanitation requirements	• Avoid cultural/heritage impacts by maintaining 100m buffer from any identified heritage feature and demarcation. • Any buried artefacts that may be uncovered during site activities will require such activities to stop to assess their significance and determine appropriate mitigation measures • The minimal area required for site establishment must be provided. • The soil disturbance and clearance of vegetation for movement areas will be limited to the absolute minimum required and will not be dozed or scraped with vegetation roots left intact for later re-growth.	Heritage Act Environmental Authorisation; NEMA Sec 2 Principles	Before and during drilling activities Upon cessation of the individual activity

Exploration: - Prospecting pits - Equipment maintenance & refuelling - Vehicle movements - Waste generation & management	Operational phase	Estimated 20 pits 88m² per sample site Max ±2000m² including equipment laydown area & Sanitation requirements Hydrocarbon storage <30m³	• Equipment and other visually prominent items on the site will be located in consultation with the landowner; • Make use of existing vegetation as far as possible to screen the prospecting operations from view; and • Low vehicle speeds will be enforced on unpaved surfaces. • Maintain a buffer of 100m between sampling sites and dwellings. • Storm water must be diverted around the excavation and stockpiles to prevent erosion, if necessary. • Oils and lubricants must be stored within sealed containment structures. • Fuel storage must be contained in mobile bowsers. • All chemicals and hydrocarbons shall be stored within 110% bund wall capacity. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevents spills/ leaks onto the soil. • Refuelling will be done with care to minimise the chance of spillages. • A spill kit will be available on each site where prospecting activities are in progress; and any spillages will be cleaned up immediately. • Underneath equipment with potential oil spillages shall be lined with plastic liner to prevent soil and water contamination. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Avoid hydrocarbon spills by employing proper vehicle maintenance. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling. • Due to the remote location of the site, dust emissions are unlikely to be a source of nuisance; however, the site must be wetted if required. • Rehabilitation, backfilling and preparation for re-vegetation must be done as soon as work is completed and before moving to the next sample site. • The disturbed overburden and topsoil dumpsite and movement areas should be rehabilitated by scarifying compacted areas. • Any stored topsoil should be spread over the scarified surface to promote re-vegetation and prevent soil erosion.	SANS 10103 guideline GN R. 827 (NEM: AQA) GN R. 704 (NWA) NEMA	Upon cessation of the individual activity Immediately in case of spills

Final Rehabilitation and removal of temporary infrastructure	Decommissioning	<1Ha	• Dual use access roads must be handed back to the landowner in a good state of repair. • A review of the final rehabilitation, decommissioning and closure plan must be done annually to ensure all outstanding environmental liabilities are covered and sufficient funds is available to implement the closure plan. • All fixed assets that can be profitably removed will be removed for salvage or resale. • All redundant infrastructure and services need to be demolished including ruins, buildings, foundations, footings. • Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in closure cost estimation) and the remaining treated as waste and removed from site. • Redundant structures, buildings and civil foundations (down to 500mm below surface for subsurface infrastructure) will be removed for use elsewhere or demolished and discarded. • Inert waste, which is more than 500 mm underground, such as pipes, will be left in place • All services related to the mining operation, water supply lines and storage on site will have to be demolished. • All redundant power lines and cable associated with electrical supply will be removed. • Implementing screening as part of the cleaning activities before materials are moved from the mine. • The infrastructure area will be screened for petrochemical spills and cleaned and waste from the temporary storage facility will be removed and the area cleaned. • The compacted salvage yard, lay down and movement areas will be screened for petrochemical spills and cleaned before it is ripped and levelled. • Excavations created by removing subsurface infrastructure needs to be filled, levelled and compacted. • Final walk through of complete mining lease area to ensure no mining related waste and of re-usable infrastructure remain on site.	Environmental Authorisation; NEMA Section 2 Principles	Final decommissioning

17.9 Impact Management Outcomes

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

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE	STANDARD TO BE ACHIEVED
General prospecting	Conflict with other land users	Social	Life of operation	Control through monitoring & management	Impact minimised and mitigated.
Site Access	Disturbance of onsite flora and fauna	Fauna and Flora	Construction	Remedy through restriction and rehabilitation	Impact minimised and mitigated.
	Soil compaction from repeated use of access road	Soil resources		Remedy through rehabilitation	
Site Establishment Sampling and laydown area Vegetation clearance	Disturbance of onsite flora and fauna	Fauna and Flora	Construction	Remedy through restriction and rehabilitation	Impact mitigated end use objectives
	Noise Generation	Noise		Control through monitoring & management	Impact mitigated
	Visual intrusion	Visual			Impact mitigated
Site Establishment Sampling and laydown area Topsoil stripping & stockpiling Compaction due to overburden dumps and vehicle movement	Destruction or loss of Cultural and Heritage Resources	Cultural and Heritage	Construction	Avoidance by relocation of activity	Impact avoided
	Soil disturbance and compaction and topsoil stockpiling	Soil		Remedy through restriction and rehabilitation	Impact mitigated end use objectives
	Noise Generation	Noise		Control through monitoring & management	Impact mitigated
	Dust fall & nuisance from activities	Air quality			Impact mitigated
Erection of temporary structures such as toilets, fuel tanker, water tanker	Visual intrusion	Visual	Construction	Remedy through restriction and rehabilitation	Impact mitigated end use objectives

Sample collection & storage	Vehicle and equipment noise disturbing on-site flora and fauna	Noise	Operational	Control through management and monitoring	Impact mitigated
	Dust emissions from excavations and general site activities (vehicle entrained dust)	Air quality		Control through management and monitoring	Impact mitigated
Equipment maintenance & refuelling Waste generation & management facilities	Surface and ground water contamination From hydrocarbons	Soil and water		Avoidance through management and monitoring	Impact avoided
Removal of temporary infrastructure and site rehabilitation	Dust emissions (vehicle entrained dust)	Air quality	Decommissioning	Control through management and monitoring	Impact mitigated
	Erosion due to slow recovery of vegetation	Soil and vegetation		Remedy through restriction and rehabilitation	Impact mitigated

17.10 Impact Management Actions

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

ACTIVITY whether listed or not	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**TIME PERIOD FOR IMPLEMENTATION**	**COMPLIANCE WITH STANDARDS**
General prospecting	• Conflict with other land users	Control through monitoring & management	Concurrently with prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
Site Access	• Disturbance of onsite flora and fauna • Soil compaction from repeated use of access road to sample sites	Remedy through restriction and rehabilitation	Immediately on cessation of activities.	
Site Establishment Excavations and laydown area Vegetation clearance	• Disturbance of onsite flora and fauna • Noise Generation • Visual intrusion	Remedy through restriction and rehabilitation Control through monitoring & management	Concurrently with prospecting activities as far as possible, otherwise immediately on cessation of activities.	
Site Establishment Excavations and laydown area Topsoil stripping & stockpiling Compaction due to levelling and vehicle movement	• Destruction or loss of Cultural and Heritage Resources • Soil disturbance and compaction and topsoil stockpiling • Noise Generation • Dust fall & nuisance from activities	Avoidance by relocation of activity Remedy through restriction and rehabilitation Control through monitoring & management		
Erection of temporary structures such as toilets, fuel tanker, water tanker	• Visual intrusion	Remedy through restriction and rehabilitation	Immediately on cessation of activities.	

Sample collection & storage	• Vehicle and equipment noise disturbing on-site flora and fauna • Dust emissions from excavations and general site activities (vehicle entrained dust)	Control through management and monitoring	Concurrently with prospecting activities as far as possible, otherwise immediately on cessation of activities.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
Equipment maintenance & refuelling Waste generation & management facilities	• Soil, surface and ground water contamination From hydrocarbons	Avoidance through management and monitoring		
Removal of temporary infrastructure and site rehabilitation	• Dust emissions (vehicle entrained dust) • Erosion due to slow recovery of vegetation	Control through management and monitoring Remedy through restriction and rehabilitation		

18 Financial Provision

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

- Objective 1 - To create a safe and healthy post-mining environment
  - Safe mining area
    - Maintain affected environment in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof.
    - No potentially dangerous areas; secured if required
  - Limited residual environmental impact
    - No surface and/or groundwater contamination
    - Waste management practices not creating or leaving legacies
    - Develop a landscape that reduces the requirement for long term monitoring and management
- Objective 2 - To create a stable, free draining post mining landform, which is compatible with the surrounding landscape
  - Economically viable and sustainable land fit for grazing, as close as possible to its natural state.
    - Improve Land use with an increased production with regard to grazing.
    - Minimise disturbance of ecology due to loss of habitat and noise/visual/dust
    - Minimise risk of erosion from either increased base flow or prospecting operations:
    - Management of air emissions to minimise nuisance effects; implementation of dust suppression activities.
    - Increase of land with agricultural potential: backfilling, profiling and sloping of remaining excavations and ripping of all compacted areas to facilitate recovery of natural vegetation through colonization by dispersing species (patch dynamics)
    - Prevent long term changes in land use: revert back to mainly stock farming (grazing).
    - Prepare area to promote natural re-establishment of vegetation that is self-sustaining, perpetual and provides a sustainable habitat for local fauna and successive flora species
- Objective 3 – To provide optimal post-mining social opportunities
  - Optimised benefits for the social environment
    - Maintain positive and transparent relationships with stakeholders: maintaining communication channels to all stakeholders and forums.
    - Provide stakeholders with relevant information: and providing information to authorities as per legislative requirements.
    - Undertaking environmental management in accordance with the implementation, maintenance and auditing of an environmental management system.
  - Minimal negative aesthetic impact
    - Maintain affected environment in an improved state containing no foreign debris or other materials.

The legal framework within which all the above lies entails:

- Defining and meeting closure standards.
- Complying with legislation.
- Sufficient financial provision for mine closure activities.
- Monitoring and plan for latent environmental impact.

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

The closure objectives are reported in the draft BAR as well as the Final Rehabilitation, decommissioning and mine closure plan Including Environmental Risk Assessment and was made available to all registered interested and affected parties.

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

Refer Final Rehabilitation, decommissioning and mine closure plan Including Environmental Risk Assessment Annexure 1.

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

The closure objectives are to return the land disturbed by drilling activities back to its original condition taking into account the transformation due to historic large-scale mining in the area. The rehabilitation plan provides the detail on how this will be achieved. Through experience, it can be confirmed that effective rehabilitation of drill sites is possible and achievable with the rehabilitation plan set out in Annexure 1.

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

As per Paragraph 11 of this report and Annexure 1.

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

As per Paragraph 11 of this report and Annexure 1.

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

i) Monitoring of Impact Management Actions
ii) Monitoring and reporting frequency
iii) Responsible persons
iv) Time period for implementing impact management actions
v) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
All Prospecting Activities	N/A	Ensure that the prospecting programme is being implemented in line with the approved prospecting works programme	Site Manager and Geologist	**Annual** Submit a prospecting progress report to DMR
	All commitments contained in the BA Report and accompanying EMPr	Ensure commitments made within the approved BAR and EMPr are being adhered to.	Site Manager and independent EAP	**Annual** Undertake and submit an environmental performance audit to DMR
Site establishment	Visual inspection of soil erosion and/or compaction	All exposed areas, access roads, the excavation site and soil stockpiles must be monitored for erosion on a regular basis and specifically after rain events.	Site Manager Contractor (or sub-contractors)	**Weekly, and after rain events (only during invasive activities)** Weekly monitoring reports to be signed-off by the Site Manager Corrective action to be confirmed and signed-off by the Site Manager Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted to the Site Manager.
Sampling Activities	Visual inspection of biodiversity impacts	Visual inspection of site activities and other possible secondary impacts • Control and minimise the development of new access tracks • Appropriate storage and handling of topsoil		

Sampling Activities	Visual inspection of pollution incidents, the integrity of secondary containment structures and waste management Housekeeping & maintenance	• All secondary containment structure will be inspected on a daily basis to confirm the integrity thereof and to identify potential leaks timeously. • All spill incidents will be reported and corrective action taken in accordance with an established spill response procedure. • Standard waste management practices must be implemented to prevent contamination and littering.	Site Manager Contractor (or sub-contractors)	Weekly monitoring reports to be signed-off by the Site Manager Corrective action to be confirmed and signed-off by the PSM Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted Report incidents in terms of the relevant legislation, including the MPRDA, NWA and NEMA.
Post Prospecting Post Closure	Groundwater Revegetation Stability Soil erosion Alien invasive species	Inspection of all rehabilitated areas to assess whether soil erosion is occurring and to implement corrective action where required. • Identify any areas of subsidence around excavations and undertake additional backfilling if required.	Site Manager	**Final Closure** A final audit report for site closure must be submitted by the DMR for approval

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

An external environmental performance audit shall be conducted annually by an independent environmental assessment practitioner that include an annual rehabilitation plan for implementation during the next reporting period. A review of the Final decommissioning, rehabilitation and mine closure Plan will also be done on an annual basis together with an update of the quantum calculations for financial provision for rehabilitation.

19 Environmental Awareness Plan

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

Training is part of its Induction process and environmental Management System (EMS). The induction includes:

- Awareness training for contractors and employees;
- Job specific training – training for personnel performing tasks which could cause
- potentially significant environmental impacts;
- EMS training;
- Comprehensive training – on emergency response, spill management, etc;
- Specialised skills; and
- Training verification and record keeping

Before commencement of the prospecting activities all employees and contractors who are involved with such activities should attend relevant induction and training. It is standard practice for employees and the employees of contractors that will be working on a new project or at a new site to attend an induction course where the nature and characteristics of the project and the site are explained.

The training course should include key information abstracted from the EMP pertaining to the potential environmental impacts, the mitigation measures that will be applied, the monitoring activities that will be undertaken and the roles and responsibilities of contractors' and personnel.

The full EMP document is also made available to attendees.

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

Environmental risks and how to manage them are dealt with in the induction course referred to in section (m) (i) above. If an incident of environmental pollution or damage does occur it is analysed and appropriate prevention and/or mitigation measures are developed. These measures are added to the EMP and conveyed to the relevant personnel.

All unplanned incidents with the potential to cause pollution or environmental degradation or conflict with local residents will be reported to the Mineral Resources Manager within 24 hours.

Hydrocarbon Spills

Hydrocarbon spills that are considered to be emergency incidents are large-scale spills (cover a surface area >1m2), resulting from situations such as; a leaking diesel bowser, an oil drum that is knocked over, large spillages from equipment, etc.

Activities that are involved in the clean-up of such instances include:

- The containment of the spill,
- The removal of all contaminated material, and
- The disposal (at a licenced hazardous disposal facility) or bioremediation (at a licenced facility) of this material.

Fire

There is the potential for fire to occur in the following locations of the drill site:

- Veld fires across vegetated areas; and
- Vehicles and equipment.

Veld fires: Any person who observes the fire must report it to the fire brigade immediately and then to their supervisor. If possible, additional personnel may be sent to contain the fire, but only if the lives of the personnel will not be endangered.

Vehicles and Equipment: Fire extinguishers will be available at the site where drilling activities will take place and in the vehicles. All staff members will be trained in the use of fire-fighting equipment.

19.3 Specific information required by the Competent Authority

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

Not applicable at this stage

20 Undertaking

The EAP herewith confirms

- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.

Signature of the environmental assessment practitioner:

N.J. van Zyl
Reg. EAP (EAPASA 2019/2034)
June 2023

-END-

Annexure 1: Final Rehabilitation, decommissioning and mine closure plan Including Environmental Risk Assessment and quantum calculations

Annexure 2: Site sensitivity verification and screening tool report

~~**Annexure 3: PPP summary to be included with the Final Basic Assessment Report**~~

~~**Annexure 4a: Phase 1 HIA in process**~~

~~**Annexure 4b: Desktop Underwater HIA in process**~~

~~**Annexure 4c: Desktop PIA in process**~~