mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

FOR COMMENT

MAY 2017

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: Dunrose Investments 174 (Pty) Ltd

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FILE REFERENCE NUMBER SAMRAD: KZN 30/5/1/1/2/10662 PR

1. Important Notice

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

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

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

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

It is 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.

2. 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.

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ABBREVIATIONS

BAR	Basic Assessment Report
BRP	Bioregional Plan
BSP	Biodiversity Sector Plan
CBA	Critical Biodiversity Area
CBA	Critical Biodiversity Areas
CITEs	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EC	Electrical Conductivity
EKZNW	Ezemvelo KwaZulu Natal Wildlife
EMPr	Environmental Management Programme
ESA	Ecological Support Area
FEPA	Freshwater Ecosystem Priority Area
HESASA	Household Energy Safety Association of Southern Africa
I&APs	Interested and affected parties
IBAs	Important Bird Areas
IDP	Integrated Development Plan
ILLM	Inkosi Langalibalele Local Municipality
IUCN	International Union for Conservation of Nature
IUCN	International Union for Conservation of Nature
JORC	Joint Ore Reserves Committee
KZN	KwaZulu Natal
KZNEDTEA	KwaZulu Natal Economic Development, Tourism and Environmental Affairs
MINMEC	Ministers and Members of Executive Councils Meeting
MPRDA	Mineral And Petroleum Resources Development Act, 2002
NEMA	National Environmental Management Act
PES	Present Ecological Status
PM	Particulate Matter
PPE	Personal Protective Equipment
PPP	Public participation Process
PRA	Prospecting Right Application
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMREC	South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserve
SANBI	South Africa National Biodiversity Institute
SANRAL	South African National Roads Agency Ltd
SCA	Systematic Conservation Assessments
SO_2	Sulfur Dioxide
STATSA	Statistics South Africa
UTDM	Uthukela District Municipality
VOCs	Volatile Organic Compounds
WMA	Water Management Area
WUL	Water Use Licence

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1 DETAILS OF EAP

3. Contact Person and correspondence address
a) Details of
i) Details of the EAP

Name of the Practitioner: San Oosthuizen

Tel No.: 011 431 2251

Fax No.: 086 539 6127

E-mail address: san@ecopartners.co.za

ii) Expertise of the EAP
(1) The qualifications of the EAP.
(with evidence).

MSc Zoology

Member: International Association For Impact Assessment

Environmental Assessment Practitioners Association of South Africa

SACNASP Registered Professional Natural Scientist

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

Extensive working knowledge and understanding of environmental policies, principles and legal and other requirements as applicable to South Africa.

More than 15 years' experience in the compilation of Environmental Impact Assessment Reports and Mine Environmental Management Plans (EMPs)

Please refer to Appendix 1 for the CV.

2 LOCATION OF ACTIVITY

b) Location of the overall Activity.

Table 1: Location of the activity

Farm Name:	Remaining Extent of Portion 1 of the farm Schurfde Poort 1147 GS; and Remainder of the farm Schurfde Poort 1147 GS; and the farm Brak Fontein 18033 GT; and Remainder of the farm Ganna Hoek 1317 GS; and Portion 1 of the farm Ganna Hoek 1317 GS; and Portion 1 of the farm The Shaws 11317 GS; and Remainder of the farm Klip Berg 2158 GT; and Portion 1 of the farm Klip Berg 2158 GT: and Portion 1 of the farm Ramak 13696 GT; and Portion 2 of the farm Ramak 13696 GT; and Remainder of the farm Ramak 13696 GT.
Application area (Ha)	6,333.2240 ha
Magisterial district:	Uthukela District Municipality
Distance and direction from nearest town	14km ENE from Colenso
21 Digit Surveyor General Code for each farm portion	N0GS00000000114700001 N0GS00000000114700000 N0GS00000000131700000 N0GS00000000131700001 N0GS00000001131700000 N0GT00000018023000000 N0GT00000002158000001 N0GT00000002158000000 N0GT00000013696000002 N0GT00000013696000001 N0GT00000013696000000

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

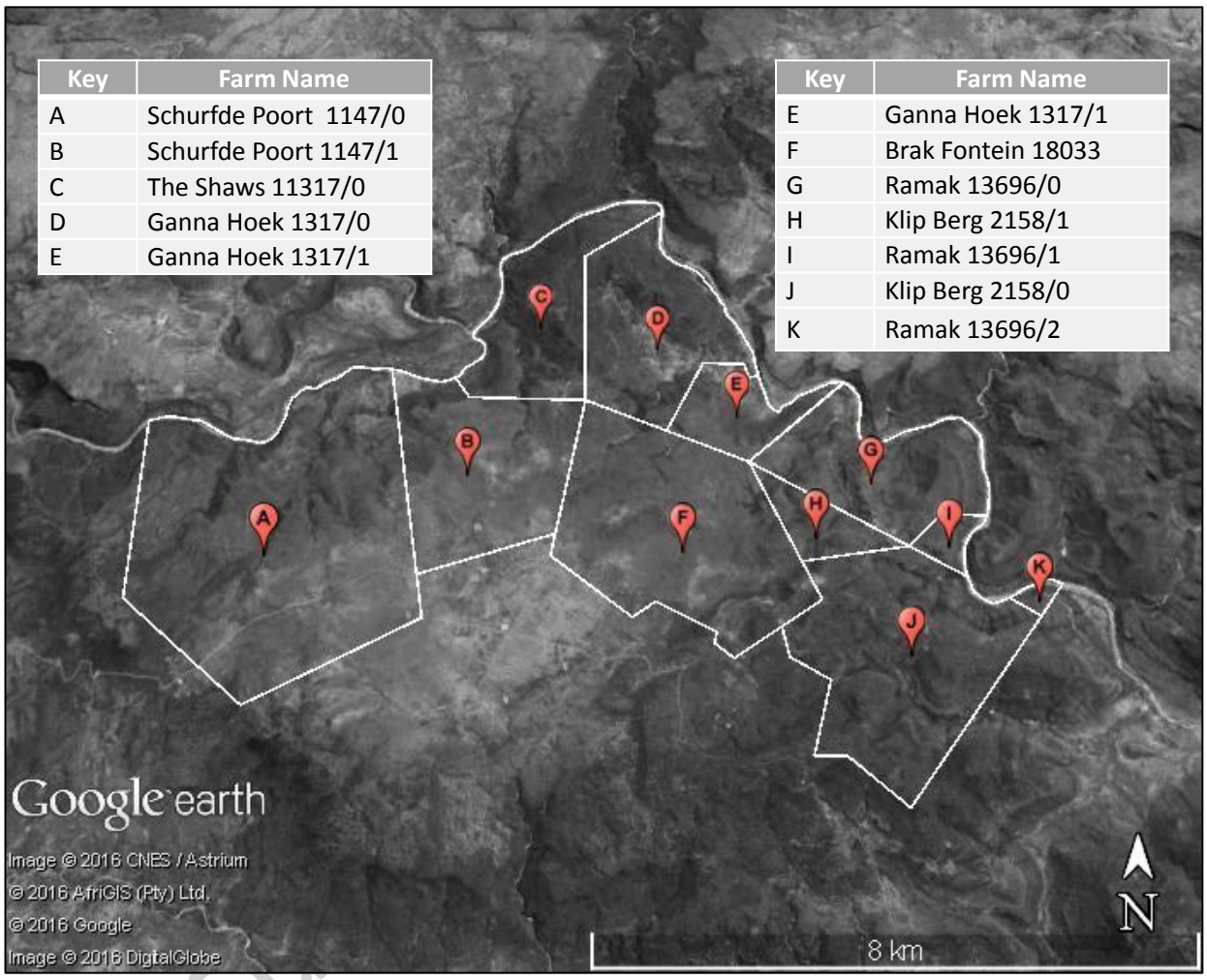
The application area is situated on a number of properties located in the Inkosi Langalibalele Local Municipality, of the Uthukela District Municipality in the KwaZulu-Natal Province (Figure 1).

The site is located 14km northeast of Colenso, 16km southeast of Ladysmith, 17km northwest of Weenen and 30km northeast of Estcourt (Figure 2). The settlements of Ezakheni, Doornkloof, Brakfontein, Makahyana and Mziyanke are located within 2km from the northern border of the site from the west towards the east.

The Tugela River borders the northern boundary of the site.

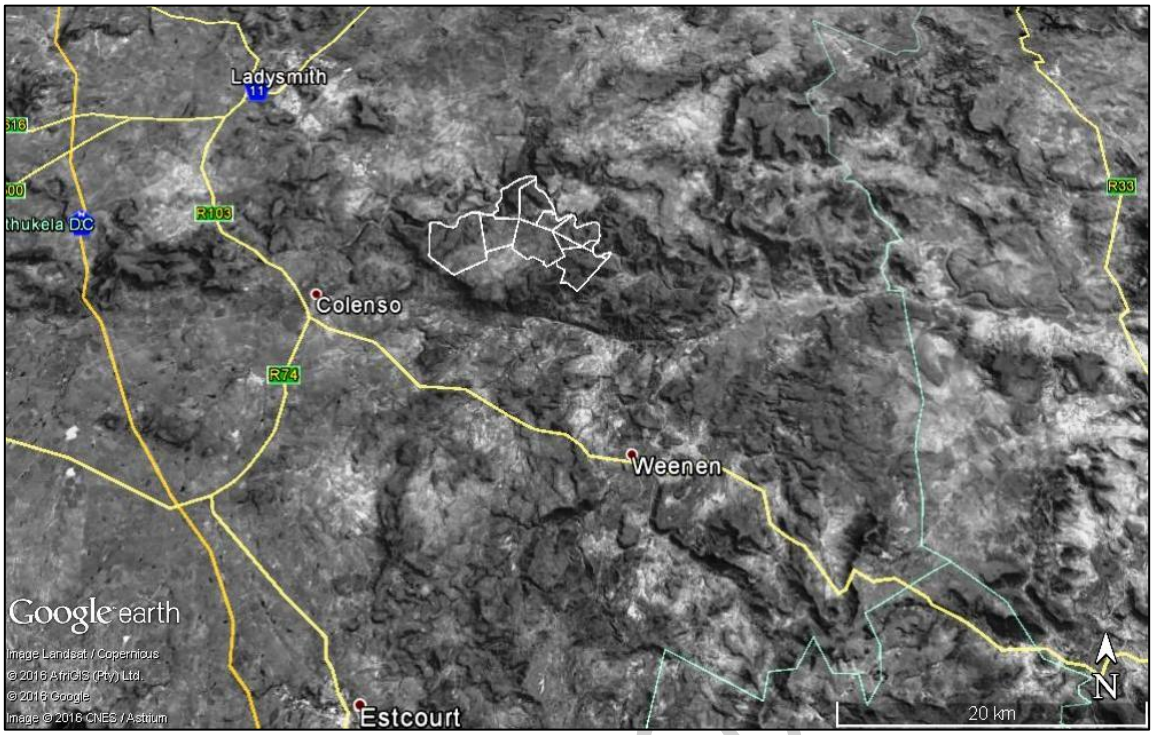
The prospecting area is situated northeast of the R74 (P12 - 3), a provincial route that runs in an east - west direction and links Colenso with Weenen to the east, and to the east of the R103 (P1-10) a provincial regional route, that runs in a north - south direction to the west of Colenso, and links with Ladysmith to the north.

Figure 1: Farm portions



Source: Dunrose Investments 174 (Pty) Ltd & Google Earth Imagery

Figure 2: Location Map



Source: Dunrose Investments 174 (Pty) Ltd & Google Earth Imagery

Please also refer to the **Locality Map** in Appendix 2.

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

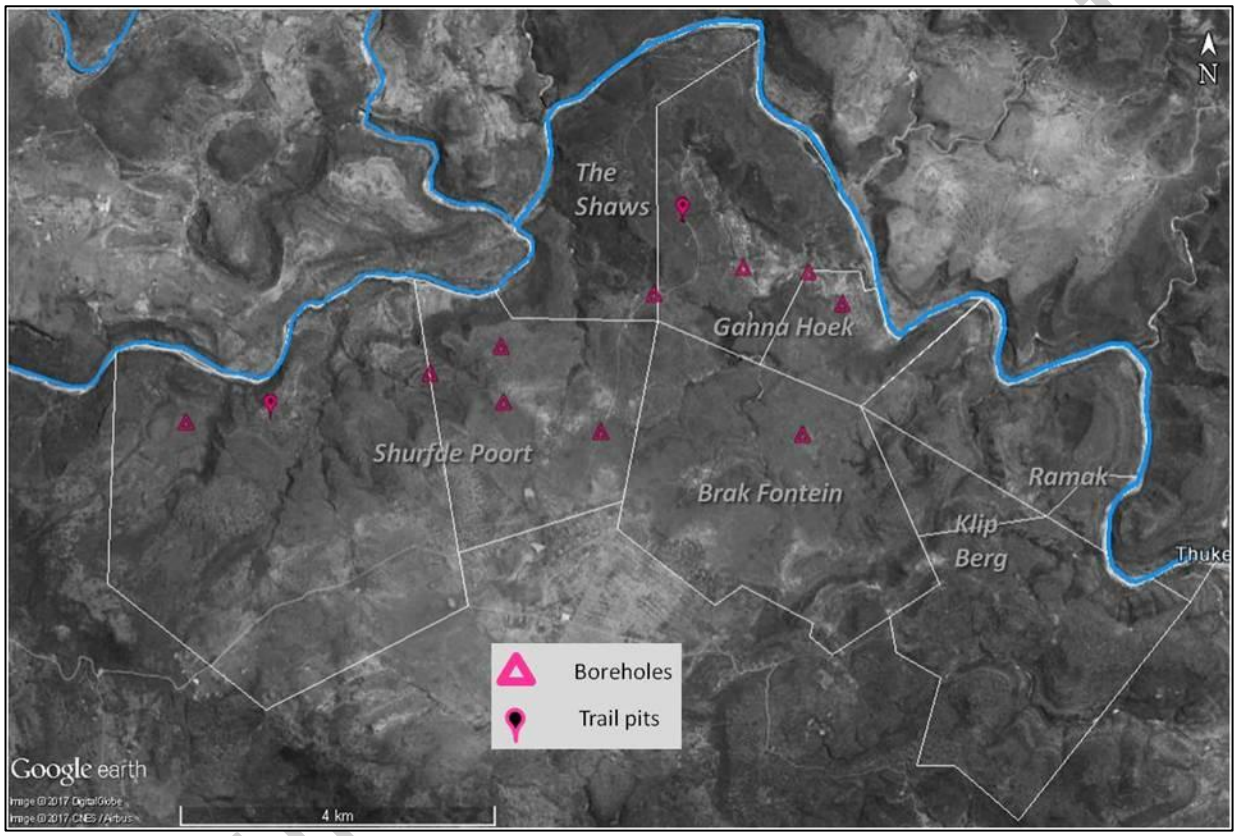
The prospecting plan consists of drilling 10 boreholes and examining 2 sets of trial pits. The existing road network on the property will be used where possible, to access the sites and no new infrastructure will be constructed. The location of the proposed boreholes, will be established to comply with Joint Ore Reserves Committee (JORC) status drilling grids stepping out from known coal measures to be determined from the non-invasive geological mapping, and will be mainly located alongside existing and previously mapped roads and/or tracks on the properties (Dunrose Investment 174 (Pty) Ltd, 2017).

The average depth of the boreholes is expected to be 75m. To support the information on the drilling and improve confidence in the ground conditions two areas will be identified for trial pitting. These will be in the east and west of the property and will be over an area of approximately 20m long x 5m wide (for a total of 0.02ha), set out as either trial pits or slit trenches, depending on the final decision of the geotechnical advisors.

The planned dimensions for each trial pit are 20 m long by 5 m wide (Dunrose Investment 174 (Pty) Ltd, 2017). The activity is not considered to be bulk sampling, because the removed material will be returned back into the pits. No metallurgical testing will be conducted. Only normal chip samples, similar to what would have been done in a drilling exercise, will be taken.

Please refer to the figure below for a preliminary drill grid.

Figure 3: Preliminary Drill Grid



Source: EcoPartners

3 DESCRIPTION OF ACTIVITY

(i) Listed and specified activities

Table 2: Listed and Specified activities

NAME OF ACTIVITY **(E.g. For prospecting** - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. for mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc. etc. etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)**
Prospecting for coal by means of in-fill diamond core drilling of 10 boreholes. The holes will be drilled to an average depth of 75m. Pitting (2 trial pits) will be necessary in the outcropping areas. Each 20m long by 5m wide.	6333.2240 ha (Disturbed area - 0.12 ha)	X	GNR 983 Listing Notice 1 Activity 20
Vegetation clearance for drill sites, trial pits & roads)	0.17 ha	X	GNR 985 Listing Notice 3 Activity 12(a)(ii)

(ii) Description of the activities to be undertaken

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

Dunrose Investment 174 (Pty) Ltd described their prospecting activities. The activity description presented below was provided by the applicant (Dunrose Investment 174 (Pty) Ltd).

The prospecting for coal in the area will occur over a three-year period divided into four phases. The first phase will consist of non-invasive and some invasive techniques, the second phase will consist of invasive techniques while the third and fourth phases will be non-invasive. The third phase will conclude with resource modelling, a pre-feasibility study and initial mine design. During the fourth phase the final feasibility and mine design will be determined.

During all phases the landowners will be engaged as to where the invasive prospecting could take place with minimal impact on their activities or livelihood.

For the full prospecting period, a maximum of 10 holes will be drilled, to an average depth of 75 m and additional pitting will be done. Pitting will be restricted to two small areas (20 m long x 5 m wide).

Drilling will take place at a maximum of three drill holes at a time. The drill site will be cleared of obstructions and debris and then drilled. Rehabilitation will occur concurrently with drilling.

Drilling will be conducted using an in-fill diamond core drill rig (refer **Figure 4**). Experience on other sites have indicated that including the turning circle of vehicles, the area disturbed rarely exceeds 100m^2 or 0.01 ha per hole. For the drilling of the envisaged 10 holes the areas to be affected will be approximately 0.10 ha. Fencing will be temporary.

Figure 4: Example of a Typical Drill Rig

Source: http://www.hyderabadrigs.com

Phases 1 – 4 add up to 3 years, but each phase might be longer or shorter depending on the data requirements or site conditions.

3.1 PHASE 1 (12 - 20 MONTHS)

Phase 1: Detailed field mapping, Pitting and Outcrop sampling

Field mapping include the field traverse (walk-down) of the farm collecting geological information; the information will be correlated with the literature study information in order to correlate with the correct stratigraphy and lithological units.

Selective outcrop and pit sampling (2 pits are envisaged, each 20 m long by 5 m wide) to determine extent and continuity of coal reserves, in selected places.

The outcome of this phase is a fully delineated surface knowledge of location of dykes and sills, outcrop and surface extent of the coal deposits and possible areas of access.

3.2 PHASE 2: (6 - 12 MONTHS)

Phase 2: Step-out drilling and downhole geophysics

In-fill diamond core drilling to determine the extent of a coal reserve for mine planning purposes and detailed design of mine. It is anticipated that 10 holes with an average depth of 75 m will need to be drilled.

The location of proposed boreholes, will be established to comply with the Joint Ore Reserves Committee (JORC) status drilling grids, stepping out from known coal measures to be determined from the non-invasive geological mapping, and will be mainly located alongside existing and previously mapped roads and/or tracks on the properties.

The results of this phase will be a measured and indicated coal resource on the property.

3.3 PHASE 3: (4 - 8 MONTHS)

Phase 3: Prefeasibility studies and initial mine design

Results available from previous prospecting on the area will be utilised to determine an initial resource for the area. This initial resource will be expanded upon as necessary to make an informed decision on the drill grid. Previous work done on the area might provide information on the initial prefeasibility requirements and these models, when available, can be expanded upon with the resource expansion work completed in Phase 2

During this stage the initial mine design will be commenced.

3.4 PHASE 4: (4 – 8 MONTHS)

Phase 4: Final Feasibility and mine design

A feasibility study will then be conducted and the reserves of the deposit calculated and a decision to apply for a mining right will be taken. This will follow the generally

accepted requirements as laid down in the JORC or the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserve (SAMREC) codes and standard engineering practice for feasibility studies: graduating from initial economic assessments through conceptual mine design and budget costing, to definitive feasibility study with reserves and resources in order to satisfy bank debt financing risk requirements.

3.5 EQUIPMENT & STAFF

The equipment to be used is as follows:

(a) Drill Equipment

(b) Mechanical Shovel

(c) Temporary Fencing

(d) Wooden pegs

(e) Safety Cones

(f) Field vehicles

(g) Water tanker

(h) Spades

(i) First aid kit

(j) Sample bags

(k) PPE (dust mask; gloves; goggles reflector vest)

All equipment that can will be insourced from competent and reliable contractors in the local area.

A suitable nearby area will be identified and fenced off where equipment will be stored.

The drill crew will consist of 10 -12 crew members with various technical skills. Staff will be living in their own accommodation, either in existing dwellings on site or in Colenso. There will be portable toilets located on site to provide sanitary facilities to the employees.

4 LEGAL FRAMEWORK

e) Policy and Legislative Context

Table 3: Legal framework

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
(a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process		*(E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)*
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	Section 24 environmental right considered in impact assessment	Application for authorisation for EIA Regulations, 2014 Listed Activities (This application)
Mineral and Petroleum Resources Development Act (Act 28 of 2002) as amended	Application	Application for a prospecting right (This application).
• Regulations GN R 527 of 23 April 2004 in terms of the of the MPRDA	Impact Management & mitigation	Application for a prospecting right (This application) and compilation of EMPr.
The National Environmental Management Act (NEMA) (Act No. 107 of 1998) as amended	Impact Management & mitigation	Application for authorisation of listed activities.
• Regulation 982 of 4 Dec 2014– EIA Regulations. Amended by GNR 326 of 7 Apr 17	Application, EIA Process, Identification of listed activities	Application for authorisation for EIA Regulations, 2014 Listed Activities (This application).
• Regulation 983 of 4 Dec 2014- Regulations Listing Notice 1 – Activities that require a Basic Assessment Process. Amended by GNR 327 of 7 Apr 17	Identification of listed activities	Application for authorisation for EIA Regulations, 2014 Listing Notice 1 Activities (This application).
• Regulation 985 of 4 Dec 2014 – Regulation Listing Notice 3 – Activities in specific identified geographical areas that requires authorisation. Amended by GNR 324 of 7 Apr 17	Identification of listed activities	Application for authorisation for EIA Regulations, 2014 Listing Notice 3 Activities (This application).
National Environmental Management: Air Quality Act (AQA) (Act No. 39 of 2004) as amended	Air Quality management	Dust control mitigation measures proposed in EMPr.
• National dust control regulations for South Africa of 1 November 2013	Air quality impact identification and management	Included in EMPr for Air Quality Management
National Environmental Management Waste Act (Act No. 59 of 2008) as amended	Waste management	Responsible waste management practices included in EMPr

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
National Environmental Management Biodiversity Act (NEMBA: Act 10 0f 2004)	Description of the baseline environment	Considered in Fauna & Flora Assessment. Application for authorisation for EIA Regulations, 2014 Listing Notice 3 Activities (This application). Buffers and No-Go areas identified.
• National Biodiversity Assessment (NBA; 2011)	Description of the baseline environment	Considered in Fauna & Flora Assessment.
• National List of Threatened Terrestrial Ecosystems (2011)	Description of the baseline environment	Considered in Fauna & Flora Assessment
• Threatened or Protected Species List (ToPS List) – Government Gazette Notice No. 389 of 2013	Description of the baseline environment	Requirements included in EMPr
National Veld And Forest Act (Act 101 of 1998)	Ecological management	Considered in Vegetation Assessment.
The National Forest Act (Act 84 of 1998)	Description and management of trees	Considered in Vegetation Assessment. Requirements included in EMPr
The Environment Conservation Act ("ECA") (Act No. 73 of 1989)		
• Noise Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992)	Considered in Impact Assessment	Noise management included in EMPr
National Water Act (Act No. 36 of 1998) as amended	Description of surface & ground water, management baseline environment	Utilised in surface & ground water, management assessment. Responsible water management practices included in EMPr
• National Freshwater Ecosystems Priority Atlas	Description of the baseline environment	Utilised in Freshwater Assessment. Buffer areas included in EMPr
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	Description and management of soils	Utilised in Soil & Agricultural Potential Assessment
National Environmental Management Protected Areas Act (Act 57 of 2003)	Description of the baseline environment	Considered in Impact Assessment
Hazardous Substances Act (Act No.15 of 1979)	Mitigation and management options in terms of hazardous substances storage, use, transport and handling	Responsible handling of hazardous substances included in EMPr
National Heritage Resources Act (Act No 25 of 1999)	Description and management of heritage resources	Utilised in Heritage Assessment. SAHRA has been notified. Mitigation measures and No go areas included in EMPr

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
KwaZulu-Natal Systematic Conservation Plan (KZNSCP)	Description and management options for environment	Utilised in Impact Assessment. No go areas and mitigation measures included in EMPr
KwaZulu-Natal (KZN) Biodiversity Sector Plans	Description and management options for environment	Utilised in Impact Assessment. No go areas and mitigation measures included in EMPr
The Nature Conservation Ordinance (Ordinance 15 of 1974)	The Ordinance makes extensive provision for protected areas (including private nature reserves) and protection of flora and fauna	Considered in Fauna and Flora Assessment
KwaZulu-Natal Nature Conservation Management Act, (Act No. 7 of 1997)	The KwaZulu-Natal Nature Conservation Service (KZN Wildlife) is established in terms of the Act and essentially comprises the staff compliment of the Nature Conservation authority in KwaZulu-Natal	KZN Wildlife identified as stakeholder and notified
KwaZulu-Natal Nature Conservation Amendment Act (Act No. 7 of 1999)	Description of the baseline environment	Considered in Fauna and Flora impact assessment. Requirements included in EMPr
KZN Heritage Act 4 of 2008	Amafa / Heritage KwaZulu-Natal is the provincial heritage conservation agency for KwaZulu-Natal	Amafa identified as stakeholder and notified.
2016/2017 KZN 237 Integrated Development Plan	Description of the baseline environment	Considered in Socio- economic Assessment
CITES	Description of the baseline environment	Considered in Fauna and Flora Assessment
IUCN Red Data List	Description of the baseline environment	Utilised in Fauna and Flora Assessment
SANBI Red List of South African Plants	Description of the baseline environment	Utilised Flora Assessment
Uthukela District Municipality IDP, 2016	Description of the baseline environment	Considered in Socio- economic Assessment

The described prospecting activities will trigger two listed activities under the National Environmental Management Act, Act 107 of 1998.

5 NEED AND DESIRABILITY

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

5.1 NEED AND DESIRABILITY OF THE PROPOSED PROSPECTING

South Africa's indigenous energy resource base is dominated by coal. Internationally, coal is the most widely used primary fuel, accounting for about 36% of the total fuel consumption of the world's electricity production. About 77% percent of South Africa's primary energy needs are provided by coal. This is unlikely to change significantly in the next two decades owing to the relative lack of suitable alternatives to coal as an energy source. Many of the deposits can be exploited at extremely favourable costs (http://www.energy.gov.za/files/coal_frame.html).

South Africa is home to 3.5% of the world's coal resources and the country's production is 3.3% of the world's annual total. Exports are 6% of global exports and this ranks South Africa as 6th in the list of coal-exporting nations. In 2014, South Africa produced 260Mt of coal. Of this, 182.7Mt were sold internally with a value of R54.7 billion and 69.6Mt, worth R46.7 billion, were exported. Coal provides 81% of the power generated by state-owned power utility Eskom. Eskom operates 16 power stations and is building two more to come on stream by 2021 (http://www.chamberofmines.org.za/sa-mining/coal). It is proposed that Eskom will retire four more inefficient power stations by 2025 (Capozorio, B, 2017) however this is being vigorously opposed by various stakeholders (Businesslive, 2017).

Anthracite coal represents low grade metamorphism and has the highest carbon content (85-95%) of all coal, with the fewest impurities and low volatile matter content of less than 10%. It the most metamorphosed type of coal, but still it has a calorific value which may be up to 8,000 to 8,500 kcal/kg which can be less than that of bituminous coal due to its lower hydrogen and volatile matter content (Falcon, 2013). Bituminous coal is South Africa's main export coal, with anthracite having to be imported due to dwindling reserves. In 2012 South Africa's estimated anthracite reserves stood at approximately 1.1664 Bt., compared to 2.124 Bt. in 1984. South Africa's anthracite is largely present in the KwaZulu Natal province and southern parts of Mpumalanga (Snyman, 1998).

Anthracite is mined from the oldest geological formations, and therefore has spent the longest time underground and been subjected to the most pressure and heat, making it the most compressed and hardest coal. Hard coals contain greater potential to produce heat energy than do the softer, geologically "newer" coals. Anthracite is the hardest and most brittle of all coals, and when burned, produces a very hot blue flame.

Anthracite is considered the cleanest burning of all coal types. Anthracite produces more heat and less smoke than other coals. Anthracite contains a great deal of fixed carbon (80% to 95%) and very low sulfur and nitrogen (less than 1% each). Volatile matter is low at approximately 5 percent, with 10 to 20% ash possible. Moisture content is roughly 5 to 15 percent. It is slow burning and difficult to ignite because of its high density, so few pulverized coal fired plants burn it (www. energy.about.com).

The applicant has quantified the rehabilitation guarantee required and indicated their willingness to set aside the amount to ensure that rehabilitation after prospecting is adequately funded. The mitigation measures that have been recommended are implementable by the applicant and they are aware of these as evidenced by the sign-off of the report.

As the prospecting programme is currently planned, no waste accumulation will occur. This includes waste generated by the workers who are temporarily in the area as well as waste from the prospecting activities themselves. The EMPr also described the regular removal of general waste.

The stakeholders that have been identified include the Land Claims Commissioner, Department of Rural Development and Land Reform as well as the Local Municipality. All have been engaged and engagements will be ongoing so that they remain informed of the proposed activities. They are also entitled to meet away from the applicant and co-ordinate a response. Intergovernmental coordination is then enabled.

5.2 NEED AND DESIRABILITY OF PROSPECTING IN THE CONTEXT OF THE PREFERRED LOCATION

Anthracite coal can be mined within the Somkele and Nongoma Coal fields of North Western KwaZulu-Natal. The region consists of Dwyka-Ecca medium grained, micaceous, feldspathic sandstones and dark grey shales (Roux, P.L, 1998).

According to historic data the geology of the farms is dominated by the Middle Ecca Vryheid Formation. The investigation area is traversed by numerous dolerite dyke and

sill intrusions. A major sill transgresses across the southern part of Schurfde Poort and through the western part of Brak Fontein. The coal seams are postulated to be flat lying with a 1 degree dip to the South West. There is currently only one seam of interest in the prospect, with the possible exception of the easternmost parts of Ganna Hoek, Brak Fontein, Klip Berg and Ramak, where there are two seams, the lower seam being thin (+/-60cm and of low quality) (Dunrose Investment 174 (Pty) Ltd, 2017).

The area where the activity is intended, formerly of the Ladysmith Municipality but now of the newly formed Inkosi Langalibalele Local Municipality, is experiencing an unemployment rate of 34% and youth unemployment at 43% (StatsSA, 2011). This statistic though does not provide information of this deeply rural area. The only known project in this area is the intended development of the power station to be situated to the western edge of portion 1 of the farm Schurfde Poort 1147.

Prospecting activities do not by themselves create job opportunities. However, in the event that this area develops into a mine, then job creation will follow, including during construction and then fewer, more permanent jobs during the operation of the mine. This is still premature at this stage as this is a prospecting right application.

Prospecting activities do not by themselves create housing opportunities. However, in the event that this area develops into a mine then housing, which is a requirement of the Mining Charter, must be made available through the mining operator and as a condition of their license.

6 ALTERNATIVES

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

Location Alternatives: The area selected by the applicant provides the ideal geological features for the presence of coal. The location is also preferable in that it is located closest to the proposed power station being considered for the area. There are no sites which have a similar location advantage. The applicant has noted that an extension of 2-3 km to the south could also have been included to encompass a larger area but remains certain the current location is preferable. North of the application area any coal operation will need to traverse the Thukela River which is not ideal in terms of the applicant's objectives and it has dense settlements in place already.

Technological Alternatives: The initial option was to drill substantially more holes than what is indicated here. However, by using geophysics information available the number of holes can be moderated and reduced. There are no other technological means to increase the confidence of coal resources other than drilling the limited holes.

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

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

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:
(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

6.1 PROPERTY

There are no sites which have a similar location advantage. The applicant has noted that an extension of 2-3 km to the south could also have been included to encompass a larger area but remains certain the current location is preferable.

6.2 TYPE OF ACTIVITY

A total of 10 holes are proposed for the site supported by 2 sets of trial pits. This can be drilled at the tempo of one hole per week when using only one drill rig (including mobilisation, setting up, drilling, demobilising the site before moving away). The drilling team will not stay onsite.

All holes will be drilled by means of diamond drilling with core recovery. A Global Positional System will be used to indicate the coordinates and the location will be logged into a modelling system. It will be mapped using an ortho-photo (1:10 000 scale). The holes will be drilled to a maximum depth of 75m and the disturbed area at surface may vary between 0.3 to 0.5m. This will allow the calculation of the thickness of the overburden, as well as the thickness of the coal. A maximum of 10 holes would be drilled for the proposed site.

No prospecting activities will occur in the Irreplaceable Critical Biodiversity Area. Drill holes and trial pits will not be located closer than a 100m to a water course or within 500m from a wetland without authorisation from the Department of Water and Sanitation (DWS). Holes and trial pits will not be located within 50m from identified heritage resources and a buffer of a 100m will be kept from provincial roads and all houses / dwellings that occur on the proposed prospecting area. In this regard, a no-go map will or 'activities limited' map be developed, clearly indicating which areas are off limits.

A maximum of three holes will be drilled at a time. The drill sites will be cleared of obstructions and debris and then drilled. Rehabilitation will occur concurrently with drilling.

6.3 DESIGN & LAYOUT

This is an application for prospecting of coal mineral. No infrastructure will be developed on site. Activities will be limited to the drilling of 10 boreholes and 2 trial pits to be determined by the geological formations found during prospecting. The major design alternative is the number of drill rigs to be used during the invasive phase. Originally it was anticipated that five drill rigs will be used but a decision was made to reduce it to a maximum of three and in all probability only one drill rig will be needed. It does make the process slightly longer but the speed of rehabilitation can be closely

controlled and supervision can be better focussed. With the geophysical survey information the holes can be orientated to match the shape of the orebody.

6.4 TECHNOLOGY

The biggest technology intervention is the use of geophysical surveys, which reduce the number of holes that is ultimately needed, reducing the surface disturbance that might result from the drilling programme. It focuses the attention to the most likely area to find the targeted mineral (coal) and away from areas where it is unlikely to occur. Geophysical surveys also provide an added advantage in that the data is available quickly, allowing early commencement of execution. The safety benefits of utilising geophysical surveys is also apparent, as there is less time to keep people exposed to moving machinery, harsh environmental conditions and dangerous animals like snakes.

6.5 NO -GO OPTION

The existing agricultural activities (which are limited to grazing, hunting, occasional subsistence farming and fire wood gathering) will continue.

If prospecting is not approved the presence of anthracite coal will not be assessed by Dunrose Investments 174 (Pty) Ltd. The feasibility for mining at the proposed site will not be established. The ore which is important to the on-going provision of energy to the communities in the area and wider region, many which still does not have access to electricity, may not be identified, recovered, processed and used for the generation of electricity to uplift the communities and grow the economy. The coal power station planned for the area will then need to source coal from further away which will need to be transported in, with a potential impact on the roads.

7 PUBLIC PARTICIPATION PROCESS

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

The Public Participation Process (PPP) mainly comprises the engagement with Interested and Affected Parties (I&APs) and is of utmost importance in any assessment process. The PPP involves the following:

(a) Inform, raise awareness and increase understanding of environmental issues or any other issues that might be affected by the mining process.

(b) Establish lines of communication between stakeholders, I&APs and the project team.

(c) Provide opportunity to the various parties for the exchange of information and expression of views and concerns.

(d) Obtain contributions from stakeholders and I&APs and ensure that views, issues, concerns and queries are documented.

(e) Identify the significant issues associated with the proposed project.

EcoPartners (Pty) Ltd was appointed by Dunrose Investments 174 (Pty) Ltd as the consultant to handle the prospecting right application, including the PPP. As stipulated in Section 16 (4) (b) of the MPRDA (Act 28 of 2002), I&APs need to be notified and consulted with, as part of a prospecting right application (PRA). Regulation 41 of the 2014 EIA Regulations (GN 982 of 4 December 2014) stipulates the process to be followed for public participation.

7.1 THE ROLE OF I&APS

The Public Participation Process (PPP) begs from I&APs to also:

(a) think through the policy and legislative context (Section 4) within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

(b) contemplate the alternatives considered, (Section 6) including the activity, location, and technology alternatives;

(c) reflect on the need and desirability of the proposed alternatives (Section 5),

(d) consider the impact and risk assessment, (Section 9) (inclusive of cumulative impacts), which focused on 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, in terms of

(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) reflect on the ranking of the site sensitivities and possible impacts (Table 18) of the activity and technology alternatives on the sites and location identified through the life of the activity to—

(i) consider the preferred site, activity and technology alternative;

(ii) weigh up the proposed suitable measures to manage, avoid or mitigate identified impacts; and

(iii) contemplate potential residual risks that need to be managed and monitored.

7.2 IDENTIFICATION OF I&APS

The first phase of the PPP is to identify relevant I&APs.

The landowners and the neighbours were identified using SAMRAD, Windeed™, Searchworks™ and previous I&AP databases. Windeed and Searchworks allows EcoPartners to identify the last registered postal address of the farm owners and where available, their contact numbers.

Other I&APs that were notified are the local municipality, in this case Inkosi Langalibalele Local Municipality, as well as the State Departments and/or Organs of State which have jurisdiction in the area as listed below, the full details are in the Public Participation Appendix:

(a) uThukela District Municipality
(b) Inkosi Langalibalele Local Municipality
(c) KZNEDTEA
(d) AMAFA
(e) Ezemvelo KZN Wildlife
(f) SAHRA
(g) Department of Water and Sanitation
(h) Transnet
(i) SANRAL
(j) Provincial Road Agency
(k) Department of Economic Development
(l) Traditional Leaders
(m) Department of Environmental Affairs
(n) Department of Agriculture, Forestry and Fisheries
(o) National Department of Human Settlements
(p) Department of Trade and Industry
(q) Department of Transport
(r) Department of Tourism
(s) Department of Public Works
(t) Department of Energy
(u) Eskom Holdings
(v) Rural Development and Land Reform

7.3 NOTIFICATION OF LANDOWNERS, I&APS & STAKEHOLDERS

Landowners, I&APs and stakeholders are notified during the different stages of the process using various methods, each of these are described below:

(a) Initial Project Notification

(b) Notification of Reports

7.3.1 Initial Project Notification

7.3.1.1 Notification Letters via mail

Identified Landowners, I&APs and Government Stakeholders were supplied with a notification letter, informing them about the application that has been submitted by Dunrose Investments 174, which is accompanied by a Project Information Document (PID). The notification letter also had a registration form and a questionnaire attached to it, allowing the I&APs to raise their concerns, interest(s) in the project as well as gather other crucial information. These letters were either sent via registered mail with the South African Post Office or sent by email.

7.3.1.2 Newspaper Notice

A newspaper notice was placed in newspapers that circulate in the area; for this project the notice was placed in the following three newspapers; Estcourt News, Uthukela Eyethu Newspaper and The Daily Sun. This notice serves to notify those people who might have an interest in the project and also for those individuals whose contact details could not be obtained. The newspaper notice contained the details of the project as well as details of where additional information can be found.

Table 4: Newspapers where the notices were placed

NEWSPAPER	DISTRIBUTION AREAS	COPIES	LANGUAGE OF NOTICE	DATE PUBLISHED
Daily Sun KZN	Entire KZN Province	181,330	English	12 April 2017
Estcourt & Midlands News	Estcourt, Wembezi, Colenso, Blaaukrantz, Glenside, Mooi River, Nottingham Road.	10,000	English	13 April 2017
Eyethu Newspaper	Bergville, Winterton, Ladysmith, Ekuvukeni, Ezakheni Township, Weenen, Colenso, Watersmeet, Steadville.	15,200	isiZulu	14 April 2017

Source: Daily Sun (2017); pers.com. Estcourt & Midlands News (2017); pers.com; Eyethu Newspaper (2017); pers.com

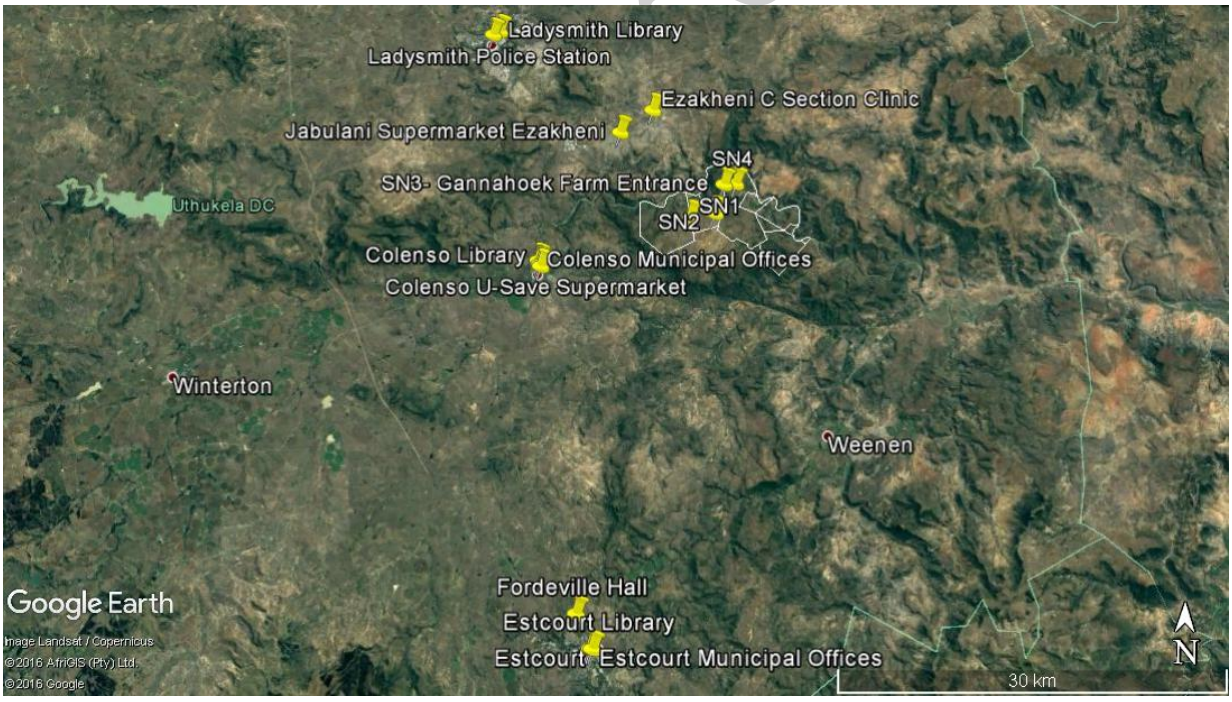
7.3.1.3 Site Notices

Site notices were put up in the area of the prospecting site and the surrounding areas. Four A2 notices and five A3 notices were put up, on and around the property The Public Participation Appendix contains the location of the site notices and pictures from the places the notices were affixed.

Figure 5: Site Notices around the Prospecting Area

Source: EcoPartners & Google Earth Imagery

Figure 6: Site Notices in the Surrounding Area



Source: EcoPartners & Google Earth Imagery

7.3.1.4 SMS

SMSs were sent to potential interested and affected parties that did not have an email address.

7.4 NOTIFICATION OF REPORTS

7.4.1 Basic Assessment Report (BAR) for Comment

The BAR for comment will be sent to the Competent Authority, in this case the DMR, for comments. Thereafter, it will be loaded onto the EcoPartners Website (www.ecopartners.co.za) for registered I&APs to access. Registered I&APs will be sent a notification to their preferred contact medium to inform them that the BAR is available for comment. Registered I&APs will be advised and assisted on how to access the document from the website. All registered I&APs that declared their interest in the project will be afforded 30 days to comment on the BAR.

Comments received from registered I&APs and stakeholders will be considered and the Final BAR amended accordingly.

A copy of the BAR will be made available at the Colenso Library.

7.4.2 Final BAR

The final BAR with all the comments incorporated from the I&APs will be made available to the I&APs in the same way that the BAR for Comment will be.

7.5 SUMMARY OF ISSUES RAISED BY THE I&APS

EcoPartners will be keeping a register of Registered I&APs. The I&AP Register is available in the Public Participation Appendix, Section 3.

Communication received during the PPP will be included in the Public Participation Appendix of the Final BAR. All comments will be addressed in the comments and response sheet in the same appendix.

Please see the table below for a summary of the issues raised to date.

iii) Summary of issues raised by I&APs

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

Table 5: Summary of issues raised by I&APs

TO BE POPULATED AFTER THE COMMENT PERIOD

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
AFFECTED PARTIES					
Landowners/s	X				
Thukela Wildlife cc – John Auld	X		None to date		
Zama Retailers Pty Ltd – A.J Dippenaar	X		None to date		
Qhubeka Community Trust-J. Ngxongo Mphili	X		None to date		
Thukela Wildlife CC – Christoph Müller	X	12-May-17	Working Agreements	We acknowledge receipt of your registration. Please note that at the appropriate time, the surface access agreement should be negotiated directly with the applicant as this relates to a commercial transaction between the applicant and the landowner. Your letter has been sent to the applicant.	
Lawful occupier/s of the land	X				
None confirmed					
Landowners and lawful occupiers on adjacent properties	X				

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Siphintuthuko Communal Property Association (Sibusiso Miya)	X	21-Apr-17	Request for Registration	Mr. Miya has been contacted and is being assisted to complete his registration.	
Emaweni Community Land Trust-Trustee					
Gannahoek Farm Trust-Trustees (Mr Sithole)	X		Registered, no comments received		
Department of Land Affairs	X		None to date		
Kwadanki Community Land Trust-Trustees			None to date		
Regional & Land Affairs	X		None to date		
Esikhaleni Community Trust-Trustees	X		None to date		
Ingonyama Trust-Trustees			None to date		
Corpclo 1860			None to date		
Municipal councillor	X				
Inkosi Langalibalele Local Municipality - Ward 20 Councillor (Muzi Ncube)	X		None to date		
Municipality	X				
Inkosi Langalibalele Local Municipality - LED Manager	X		None to date		
Inkosi Langalibalele Local Municipality - Municipal Manager	X		None to date		
Inkosi Langalibalele Local Municipality (M.E. Mvelase)	X		None to date		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
uThukela District Municipality - Municipal Manager (Sifiso Kunene)	X		None to date		
uThukela District Municipality - Heath & Environment (Bheki Khoza)	X		None to date		
uThukela District Municipality (S.C Zikalala)	X		None to date		
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA	X				
KZNEDTEA - Economic Development, Tourism and Environmental Affairs (Sihle Zikalala)	X		None to date		
KZNEDTEA -Senior Manager : Stakeholder Management (Zephania Nhleko)	X		None to date		
AMAFA (Lindiwe Msomi)	X		None to date		
AMAFA (Bernadet Pawandiwa)	X		None to date		
AMAFA (Lwazi Bhengu)	X		None to date		
SAHRIS (Nokukhaya Mkhize)	X		None to date		
Department of Water and Sanitation (Ashley Starkey)	X		None to date		
Department of Water and Sanitation (Dumisani Nyathi)	X		None to date		
Transnet (Christelle van der Merwe)	X		None to date		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Transnet (Ronelle Gabier)	X		None to date		
SANRAL (Logashri Sewnarain)	X		None to date		
Provincial Road Agency – Ladysmith (Bathandwa Nogwanya)	X		None to date		
Department of Economic Development (Makhosi Mzizi)	X		None to date		
Department of Economic Development (Ranveer Persad)	X		None to date		
Department of Water and Sanitation (Thya Pather)	X		None to date		
Department of Water and Sanitation (N. Kgabileng)	X		None to date		
Department of Agriculture, Forestry and Fisheries (Joe Kgobokoe)	X		None to date		
National Department of Human Settlements (Moipone Ngoasheng)	X		None to date		
Department of Trade and Industry (Gerhard Calitz)	X		None to date		
Department of Transport (Lydia Forssman)	X		None to date		
Department of Tourism (Jay Singh)	X		None to date		
Department of Public Works (Mbuyi Dondashe)	X		None to date		
Department of Energy (Kate Dire)	X		None to date		
Department of Energy (Bianca Selao)	X		None to date		
Department of Energy (Malusi	X		None to date		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Ndlovu)					
Eskom Holdings (Bronwyn Stolp)	X		None to date		
SANRAL (Tiyiselani Mashele)	X		None to date		
Rural Development and Land Reform (Nelisiwe Magubane)	X		None to date		
Ezemvelo KZN wildlife (Dinesree Thambu)	X		None to date		
Ezemvelo KZN wildlife (Nerissa Pillay)	X	11-May-17	This email serves to notify that your email and attachments have been well received. Ezemvelo looks forward to receiving the hardcopy BID for the proposed project.	As per our telephonic conversation, the hard copy of the BID or Project Information Document will be in the Basic Assessment Report that will be sent to your offices by 20 May 2017 Regards	
Alfred Duma Local Municipality (M. Ndlovu)	X		None to date		
Department of Land Affairs (Denver Ince)	X		None to date		
Communities					
Dept. Land Affairs (Land Claims Commission)	X				
Lynn Boucher	X	11-Apr-17	Land claims	There are landclaims on portion 1 of Ganna Hoek 1317 and remainder of Schurfde Poort 1147	
Traditional Leaders	X				
Traditional Leaders - Uthukela Local House Director (Nozipho	X		None to date		

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Msimango)					
Dept. Environmental Affairs	X				
Thizwikoni Ramavhona	X		None to date		
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					
Dave E.K Simpson	X	4-May-17	Concerns around the environment and land ownership	Good Day Dave Your registration form has been received and you are registered as an I&AP. In your form you stated that you are a landowner, can you please provide me with the farm names of the properties you own, so that we can determine the proximity of your properties in relation to the proposed prospecting application area. Regards	Section 8 & 9 PPP Appendix
Robert Alfred Lees	X	30-Apr-17	Concerns around the environment	The primary area of focus related to this prospecting right application has been identified and described in the BAR.	Section 8 & 9 PPP Appendix
Nicole Löser	X	9-May-17	Concerns around the	The concerns and primary area of	Section 8 & 9

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
			environment and the notification of other I&APs	focus related to this prospecting right application has been identified, described and assessed in the BAR. The recommended I&APs have been notified already.	PPP Appendix
Robyn Hugo	X	9-May-17	Concerns around the environment and the notification of other I&APs	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR. The recommended I&APs have been notified already.	Section 8 & 9 PPP Appendix
Ruchir Naidoo	X	9-May-17	Concerns around the environment and the notification of other I&APs	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR. The recommended I&APs have been notified already.	Section 8 & 9 PPP Appendix
Michael Page	X	24-Apr-17	No comments	The information provided has been captured	
Marthinus Johannes Becker	X	5-May-17	No comments	The information provided has been captured	
Mazizi Marxis Katamzi	X	8-May-17	Economic Development	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR.	Section 8 & 9
Alvin Cedric Anthony Govender	X	10-May-17	No comments	The information provided has been captured	
Kwanele King	X	10-May-17	Community Development and Employment	The concerns and primary area of focus related to this prospecting right	Section 8 & 9

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				application has been identified, described and assessed in the BAR. The recommended I&APs have been notified already.	
Pravesh Ramsender	X	28-Apr-17	Employment	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR. The recommended I&APs have been notified already.	
Nonjabulo Kubheka	X	3-May-17	More information requested	1. The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso power station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to. 2. Could you please SMS us all your details and please include your postal address and/or email address and if you have any concerns/interests.	
Sibongile Kubheka	X	5-May-17	More information requested	1. Thank you Sibongile The information provided has been captured	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Mthokozisi Michael Mabasa	X	5-May-17	Employment	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR.	
Priscilla Loots Ramberose	X	11-May-17	Employment and Heritage	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR. Heritage is addressed in the BAR for comment.	Section 8 & 9
Ian Alfred Neil Bloy	X	11-May-17	Employment	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR.	
Z. Ndimande	X	21-Apr-17	Request for registration	The trust has been contacted and is being assisted to complete his registration.	
Siyabonga Mnthambo	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				captured	
Thulani Brishten Hlatshwayo	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Buyani Mbukiswa Mvelase	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Sibusiso Miya	X	21-Apr-17	Request for Registration	Mr. Miya has been contacted and is being assisted to complete his	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				registration.	
Sphamandla Shabalala	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Delani Josiah Hadebe	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Sandile Xaba	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Thembalethu Mabaso	X	21-Apr-17	Clarity on SMS	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Thandeka Masengemu	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Sibusiso Buthelezi	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Nonhlanhla Kubheka	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				The information provided has been captured	
Not provided	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Sebenzile Langa	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Nomusa Mthethwa	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Desmond C. Willie	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Mandla Joyce	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Thomas Dlamini	X	21-Apr-17	Investors	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity.	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Thobile Mazibuko	X	23-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				wish to The information provided has been captured	
Mamsi Promise Thwala	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Mamsi Promise Thwala	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				captured	
Not provided	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	25-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Mncedisi Mazibuko	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Anthony Dhudhudhu Mthembu	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Nonhlanhla Dlalisa	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Bongumusa Welcome Thwala	X	24-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				opportunity to see the reports if you wish to The information provided has been captured	
Thwala Maneli Meltar	X	25-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Mbongiseni Samson Mbele	X	25-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				The information provided has been captured	
Mbongiseni Samson Mbele	X	25-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Serah Nomusa Ngubeni	X	26-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	26-Apr-17	Employment	The SMS of 21 April was about	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Smanga Dlamini	X	27-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Dumisane Nhcapho	X	3-May-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Nkosingiphile Stanley Mbhense	X	3-May-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	6-May-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	10-May-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Zwelithini Zwelithini	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				The information provided has been captured	
Faruaaz Sheik	X	10-May-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Sphamandla Khumalo	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
Vusimuzi Mabaso	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Ronnie Deen Du Plooy	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Lindiwe Makhathini	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity. The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Not provided	X	21-Apr-17	Employment	The SMS of 21 April was about Dunrose asking the DMR to look for coal on 6 farms near Colenso. The SMS is not about Colenso station and not about jobs. EcoPartners writes environmental reports for this activity.	

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issued raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
				The SMS is only informing you about what is happening and giving you the opportunity to see the reports if you wish to The information provided has been captured	
Nokwazi Florence Mpembe	X	11-May-17	Concerns on the environment and community development	The concerns and primary area of focus related to this prospecting right application has been identified, described and assessed in the BAR. The recommended I&APs have been notified already.	Sections 8 & 9 PPP Appendix

8 DESCRIPTION OF THE ENVIRONMENT

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

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

8.1 GEOGRAPHICAL CHARACTER

8.1.1 Regional Geology of Prospecting Area

The proposed prospecting area is situated within the uppermost Permian-age Volkrust and Vryheid Formations belonging to the Ecca Group of the Karoo Supergroup (Johnson, M.R, van Vuuren, C.J, Visser, J.N.J, Cole, D.I, Roberts, D.L, Brandl, G, 2006). The Karoo Supergroup is the most widespread stratigraphic unit in South Africa. With a cumulative thickness of 12 km; this basin hosts all the coal resources of South Africa.

The proposed prospecting area is located within the Klip River Coalfield. The Klip River Coalfield is the largest of the northern KwaZulu/ Natal Coalfields, and is historically the most important. It is roughly triangular in shape and the area is bounded on the west by the Drakensberg Mountain Range, the Utrecht Coalfield in the east and stretches N-S from just north of Newcastle to close to Ladysmith in the south. Nine types of dolerite sills have been distinguished. The fairly rapid compositional and textural variation in the sills has complicated the regional correlation. In this coal field, the maximum displacement of strata by dolerite sills is reported to be 137m.

The bottom and top seams are separated by between 0.3m and 15m of coarse grained, pebbly sandstone which fines upwards to carbonaceous shale.

The bottom seam has a thickness of about 1.3m in the north of the coal seam, decreasing to 1.07m in the central area and to 50 cm in the South. The coal is predominantly bright (Bright coal, is a description of coal or a coal Lithotype).

The top seam has a thickness of 3.3m in the north, decreasing to less than 0.5 m in the central area and then increasing to 1.5 m in the South. It contains a smaller proportion of bright coal than the Bottom Seam.

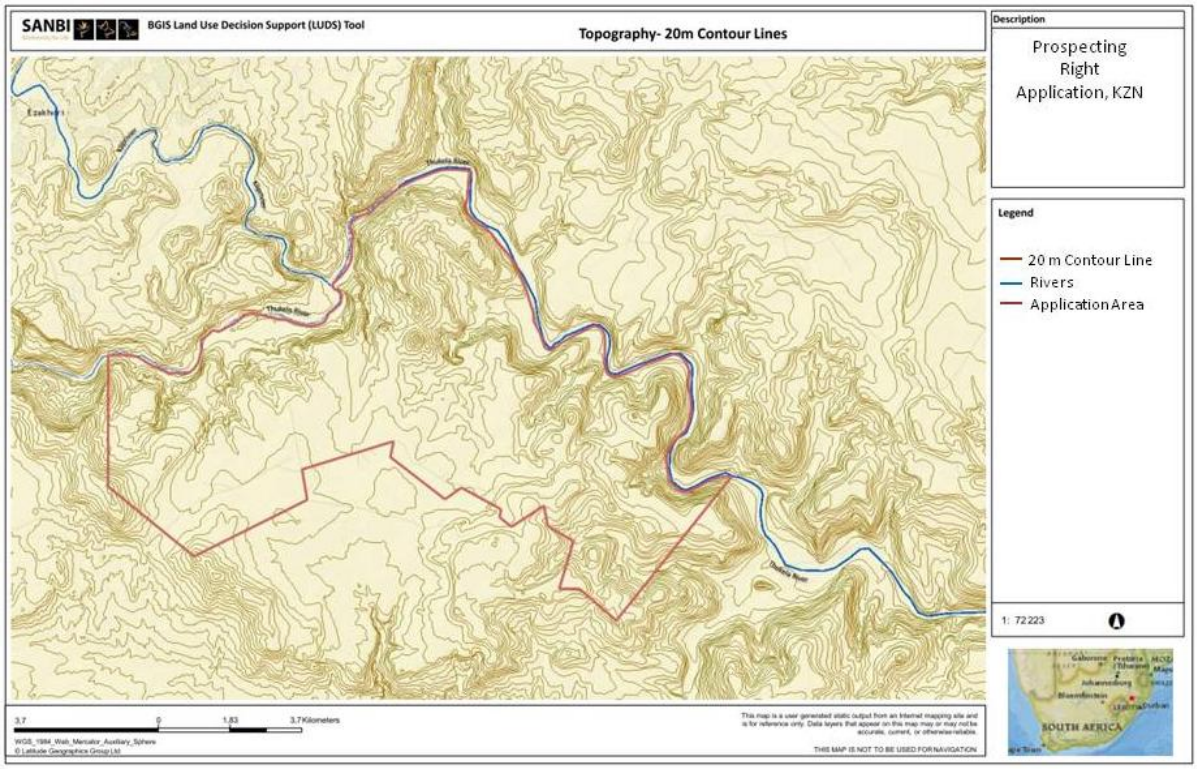
The Volksrust Formation comprises blue-grey to black mudrocks and siltstone; dark-grey shales (carbonaceous in places) and sandstones. The Vryheid Formation is exposed in places along the Thukela River valley east of Colenso. This Formation comprises thick coarse-grained sandstone beds and carbonaceous shale with thin coal seams. Coal seams are virtually horizontal throughout the main basin. The only significant disturbances are those associated with dolerite sills and dykes (Dickson, W.R., 1974).

8.2 TOPOGRAPHY

The topography in the proposed application area displays a variation of form and is characterised by a mix of relatively flat plains, hilly terrain and incised valleys (Figure Figure 7). In the south-western parts of the area the terrain is relatively flat to gently undulating with topographical variations in the form of localised hills (such as Colenso Koppie). The north-eastern part of the area is characterised by higher lying terrain that slopes down sharply toward the Tugela (Thukela) River. Overall, the topography slopes down gradually in a southern direction, with the residential community of Ezakheni in the northern parts being located on higher ground. (Gibb, SiVest, 2014)

The Thukela River carves its way across the landscape in a westerly to easterly direction, forming an incised and secluded valley with steep slopes, mountains and tall hills on either side. These mountains, hills and ridges extend southwards towards the Bloukrans River which marks the lowest point at approximately 690m above sea level.

Figure 7: Topography map - 20 m Contour Lines



Source: 20 m contour GIS Layer, SANBI, BGIS

8.3 CLIMATE

8.3.1 Temperature

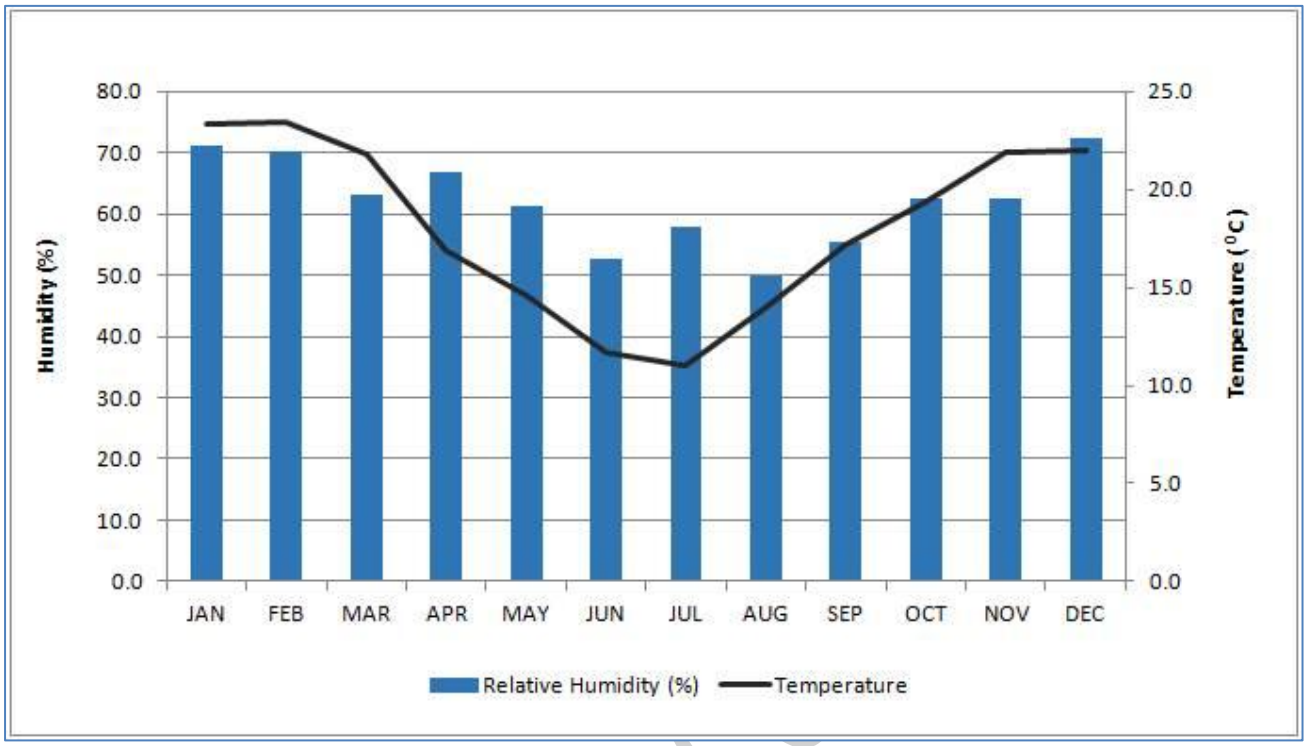
The KwaZulu-Natal Province generally experiences warm to very hot summers and mild winters. Monthly average temperatures for the Ladysmith station (closest weather station to the proposed application area) for the period January 2011 – April 2014 are given in Table 6. Average temperatures for the Ladysmith station range from approximately 22 to 23.5°C in summer to 11 to 14°C in winter. Relative humidity is lowest during autumn and winter and highest during spring and summer (Figure 8).

Table 6: Hourly Minimum, Maximum and Monthly Average Temperatures (°C) for Ladysmith

HOURLY, MINIMUM, MAXIMUM AND MONTHLY AVERAGE TEMPERATURES (C O)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Minimum	13.8	13.9	10.7	0.2	- 3	- 4.6	- 5.8	- 2.2	- 0.4	2.7	9.8	12.8
Maximum	37.8	35.6	35.6	33.2	32.9	28.9	28.4	38.8	35.3	37.3	38.8	35.3
Average	23.4	23.5	21.9	16.9	14.6	11.7	11.0	14.0	17.1	19.4	21.9	22.0

Source: Rayten, Air Quality Report (2015)

Figure 8: Monthly Average Temp (°C) and Humidity (%) for Ladysmith



Source: Rayten, Air Quality Report (2015)

8.3.2 Precipitation

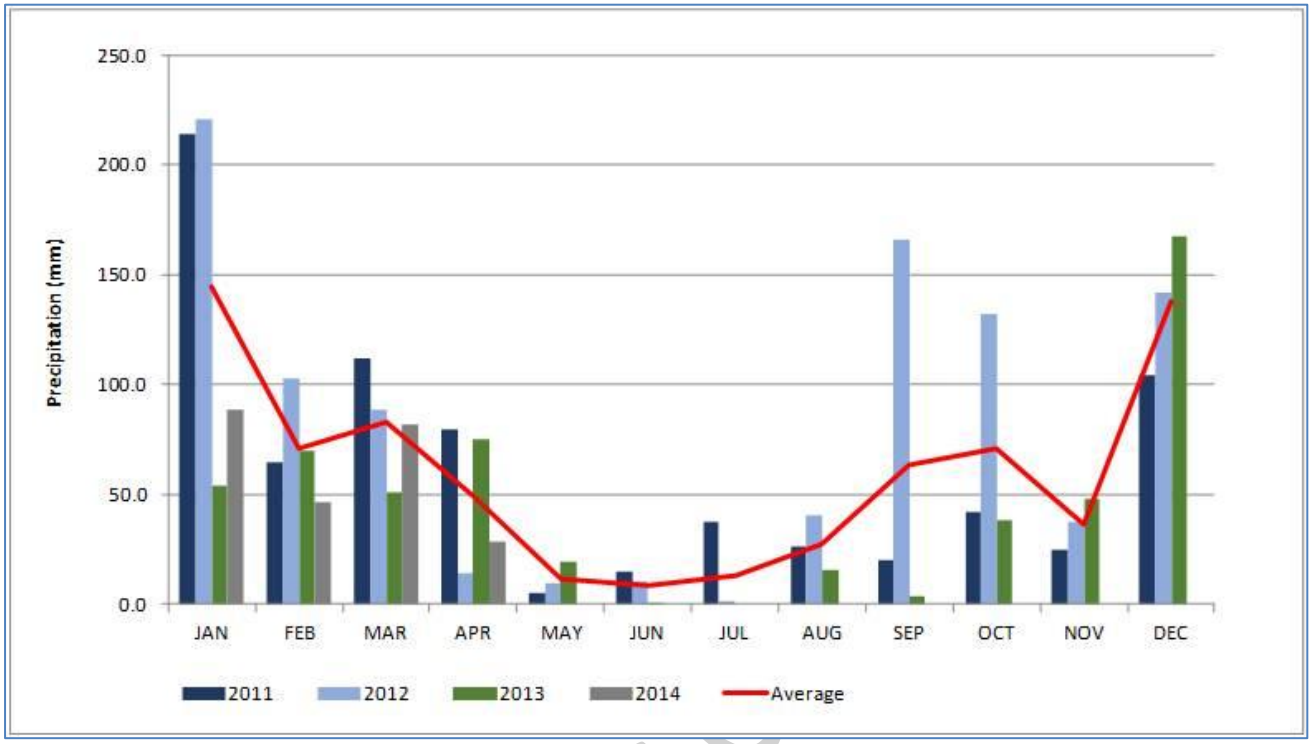
Monthly total precipitation for the proposed project area is given in Table 7 and Figure 9 for the period January 2011 – April 2014. The area experiences spring and summer rainfall, receiving most of its rainfall for the months September to March.

Table 7: Monthly Total Rainfall (mm) for the Ladysmith Station for the Period January 2011 – April 2014

TOTAL MONTHLY RAINFALL (mm)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2011	214.4	64.8	112.0	79.6	5	15	37.4	26	20.2	42.4	24.4	104.4
2012	220.8	103.0	88.4	14.0	10	10.6	1.4	40.8	166	132.4	37.8	142.2
2013	53.8	70.0	50.8	75.0	19.6	0.2	0.0	16.0	4.0	38.6	48.0	167.6
2014	88.4	46.2	82.2	28.6								

Source: Rayten, Air Quality Report (2015)

Figure 9: Monthly Total Rainfall (mm) for the Ladysmith Station for the Period January 2011 - April 2014



Source: Rayten, Air Quality Report (2015)

8.3.3 Local Wind Field

The Ladysmith weather station is the closest weather station to the proposed application area and is located approximately 20km north-north-west (28.567 °S; 29.750 °E) of the proposed project area. Meteorological data for parameters including wind speed, wind direction, and temperature were obtained for the period February 2011 – March 2017.

Figure 10: Wind speed, direction & temperature (Feb 2011 - Mar 2017)

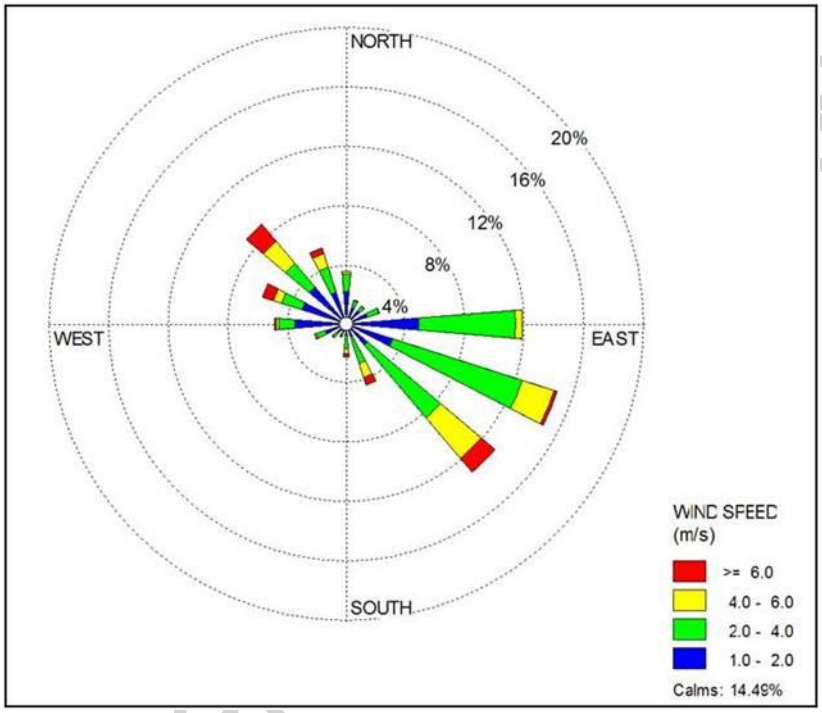
Month of year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
	01	02	03	04	05	06	07	08	09	10	11	12	1-12
Dominant wind direction													
Wind probability >= 4 Beaufort (%)	7	7	6	8	5	11	8	17	17	16	19	16	11
Average Wind speed (kts)	6	6	5	6	6	6	6	7	7	7	7	7	6
Average air temp. (°C)	22	24	21	21	18	15	15	18	22	23	24	25	20

Source: Windfinder, Ladysmith Weather Station, Wind Statistics, 2017

The prevailing wind field recorded at the Ladysmith weather station are represented as wind rose plots indicating the predominant wind direction and the frequency

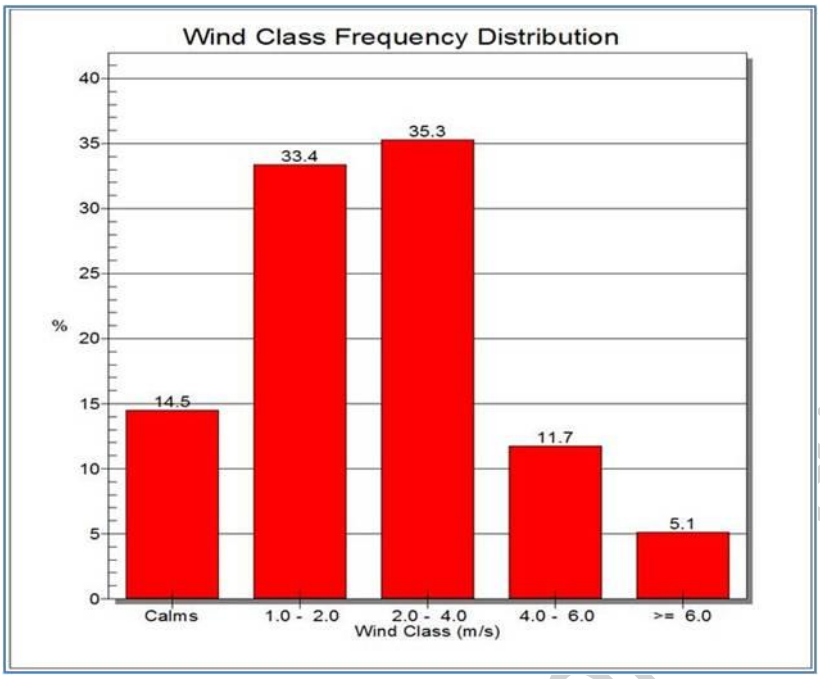
distribution of wind velocities for the proposed project area. Wind fields observed are characterised with winds occurring predominantly from the south-easterly, east-south-easterly and easterly sectors Figure 10). Wind speeds are generally slow to moderate and frequently remain within the range 1 - 4 m/s for 68.7% of the time (Figure 12). Calm conditions, which are defined as wind speeds less than 1 m/s, occur for 14.5% of the time.

Figure 11: Wind Rose for the Ladysmith Station (Period Jan 2011 – April 2014)



Source: Rayten, Air Quality Report (2015)

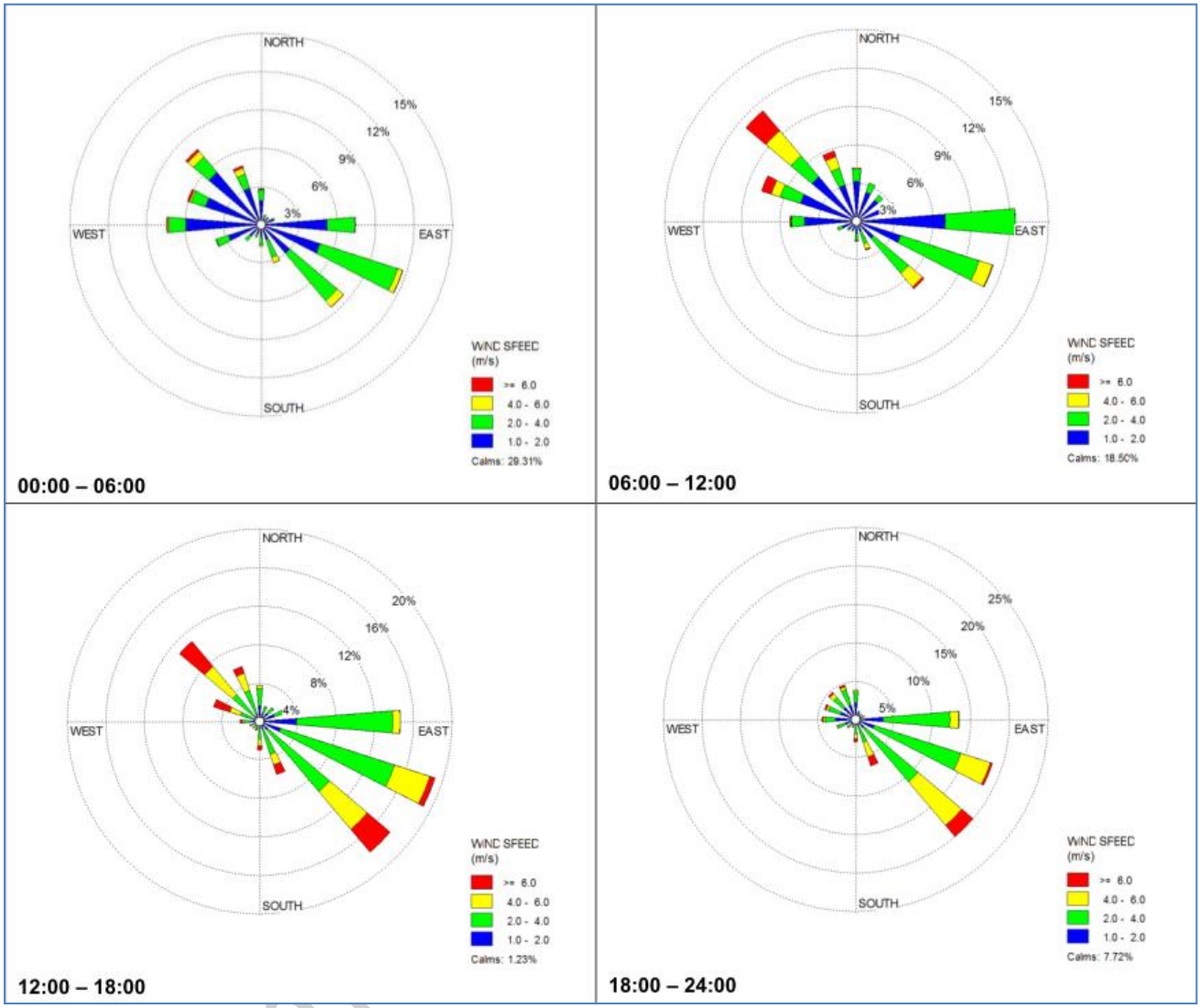
Figure 12: Wind Class Frequency for Ladysmith (Period Jan 2011 – April 2014)



Source: Rayten, Air Quality Report (2015)

Slight diurnal variation in winds is observed in the meteorological dataset for the period January 2011 – April 2014 (Figure 14). In the early morning (00:00 – 06:00), calm winds originating predominantly from the east-south-east are observed. In the late morning (06:00 – 12:00), a north-westerly component is established with slightly stronger wind speeds occurring from the same direction. During the afternoon (12:00 – 18:00), a slight shift is observed with stronger winds occurring predominantly from the east-south-east, south-east and north-west sectors. During the evening (18:00 – 24:00), the north-westerly component is less established with stronger winds occurring predominantly from the south-east, east-south-east and east.

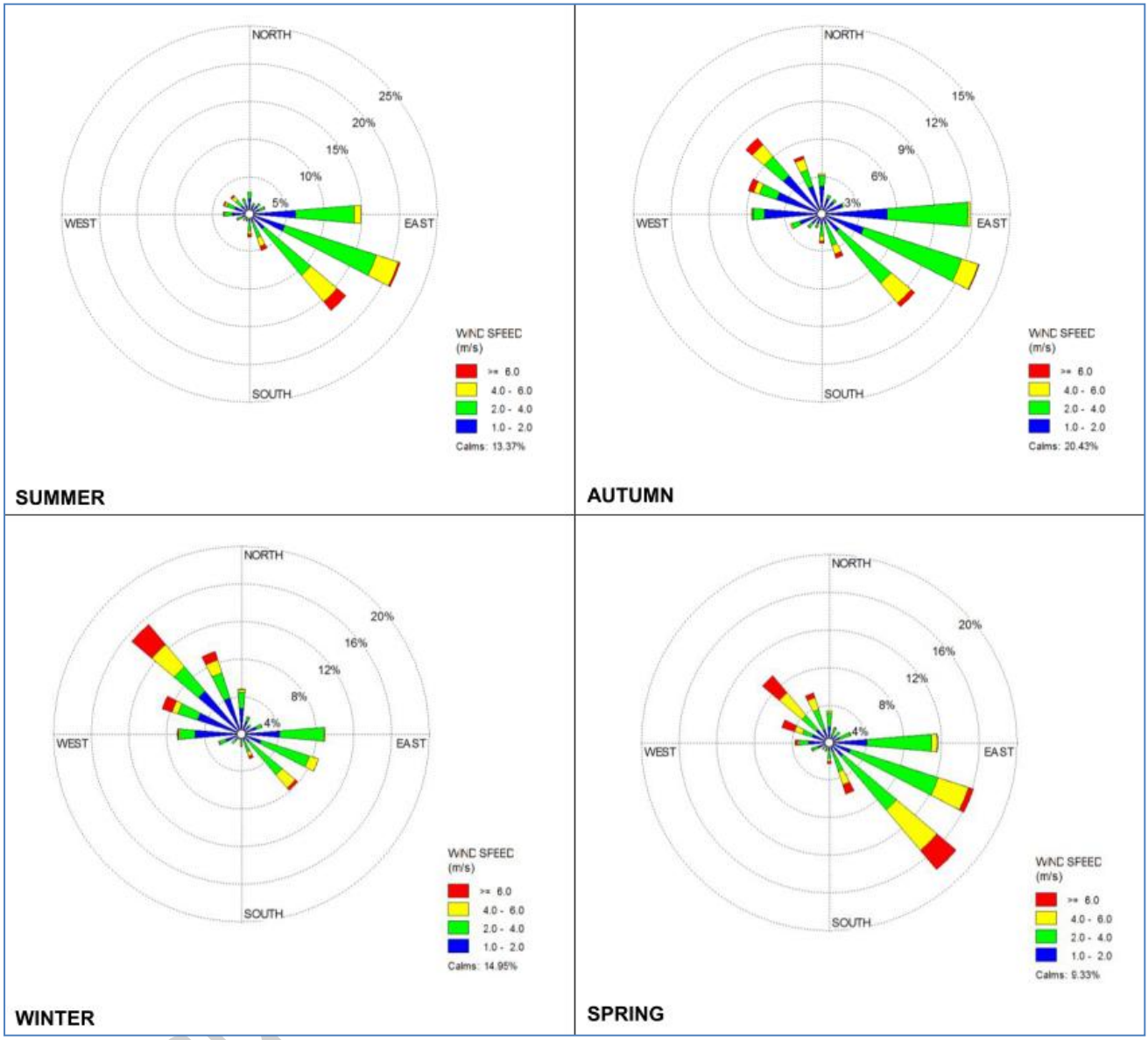
Figure 13: Diurnal Variation of Winds at Ladysmith (Period Jan 2011 – April 2014)



Source: Rayten, Air Quality Report (2015)

The seasonal variation in winds for the proposed project area is shown in Figure 14. During the spring, summer and autumn seasons, winds originate predominantly from the east, east-south-east and south-east sectors. However, in winter, a predominant north-westerly component is established. Slightly stronger wind speeds are observed during the spring and summer seasons compared to the autumn and winter seasons where a higher percentage of calmer winds are observed.

Figure 14: Seasonal Variation of Winds at Ladysmith (Period Jan 2011 - April 2014)



Source: Rayten, Air Quality Report (2015)

8.4 AIR QUALITY

The location of the proposed prospecting area is within the Uthukela District Municipality in the KwaZulu Natal Province (District location below). Land-use surrounding the proposed prospecting area is predominantly used for agricultural and to a lesser extent residential activities.

Figure 15: Uthukela District Municipality

Source: Map Data 2017 AfriGIS (Pty) Ltd, Google

In terms of the Air Quality Management plan for the Uthukela District Municipality (UTDM) the baseline assessment states that this district is predominantly rural in nature with only two local municipalities having some form of industrial economic development, namely Ladysmith and Estcourt. There are four large industries in Estcourt namely: - Nestle SA, Masonite Africa Limited, Eskort Limited and Clover Estcourt. There are two major industries situated in Ladysmith municipality namely: - Dunlop Tyres and Lasher Tools. Other light to medium size industries are of minor significance as contributors to air pollution in the district (State of the UThukela District Report, 2007).

The table that follows shows the provincial emission results from point, non-point and mobile sources, based on the KZN Baseline Emission Inventory Report (2007).

Table 8: Emissions in tons per annum

DISTRICT	CO_2	CO	SO_2	NO_X	PM	LEAD	VOCs
Umgugundlovu	114,747.33	89,030.52	1,593.16	13,281.12	4,655.99	0.00	16,092.34
Amajuba	36,197.00	22,045.40	2,756.55	3,351.73	9,091.20	0.00	4,117.83
Umkhanyakude	20,890.00	51,341.31	319.62	4,910.99	2,872.5	0.00	6,783.55
Ugu	208,674.00	44,017.25	500.82	11,920.30	1,339.74	0.03	6,748.69

DISTRICT	CO_2	CO	SO_2	NO_X	PM	LEAD	VOCs
Zululand	7154.00	25,952.49	206.75	4,158.09	1,299.11	0.00	4,777.80
Uthungulu	103395.00	183,156.67	27,629.36	9,417.30	4,045.17	0.94	9,595.49
Ilembe	0.00	7,,845.67	2,525.37	1,586.61	1,054.98	1.03	873.84
Sisonke	0.00	1,937.41	15.33	620.69	70.51	0.00	359.67
Ethekwini	3747.17	368,544.69	34,309.67	84,250.69	16679.08	1.25	67,610.10
Uthukela	0.00	35,117.08	1,296.43	5,045.97	1,652.62	0.00	6,501.20
Umzinyathi	0.00	14,411.34	117.14	1,778.19	343.22	0.00	2663.45

Source: KZN DEA, Emission Inventory (2007)

Due to its largely rural nature, UTDM only contributes 3.4 % of the total emissions in the province with the highest emissions being CO. Most of the emissions recorded for UThukela are for mobile-sources. This means that vehicle emissions are the chief contributor to air pollution in the district with industrial and agricultural sources playing a smaller role in air quality. Industrial sources of air pollution are concentrated in Ladysmith, with limited industrial activities also occurring in Estcourt. UTDM has an Air Quality Management Plan in place that was adopted on the 5th of June 2015 (Uthukela District Municipality IDP, 2016).

8.5 GROUNDWATER

Africa Geo-Environmental Services EC (Pty) Ltd (AGES) conducted a geohydrological specialist study in 2015 for a proposed development in the area.

8.5.1 Hydrocensus

A 5 km radius hydrocensus was done by AGES to obtain a baseline data set for the groundwater evaluation. The following data was recorded:

(a) GPS co-ordinates and elevation of the borehole or spring;
(b) Water levels of the boreholes, where accessible;
(c) The condition of the boreholes; and
(d) Any other information regarding the water-use, reliability and quality.

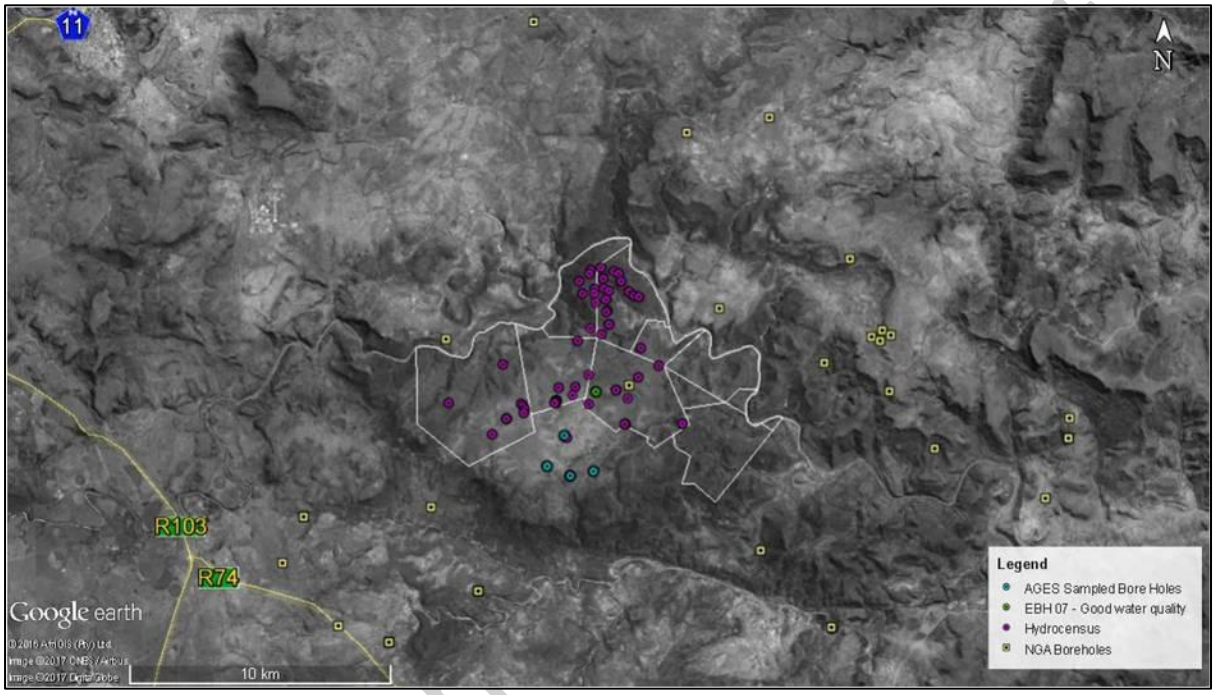
The hydrocensus was performed with the available NGA (National Groundwater Archive) data as its basis, which consists of historically registered groundwater related geosites, such as boreholes and springs. Only one of the reported eight NGA sites within a 5km radius could be verified on site namely EBH06.

The majority of boreholes found in the 5km radius during the hydrocensus investigation in 2015 were newly drilled coal exploration boreholes. There were 22 existing water boreholes in the 5km radius. EBH07 was the only borehole in use as a

production borehole for human consumption on Emaweni Game Farm (approximately 1.2 km from the boundary of the farm Schurfde Poort 1147). Also included in the hydrocensus were seven newly drilled monitoring boreholes. In total, with the monitoring boreholes included, 65 boreholes were verified in the area.

The location of boreholes of these boreholes are shown in Figure 16.

Figure 16: Location of all hydrocensus boreholes within 5km radius



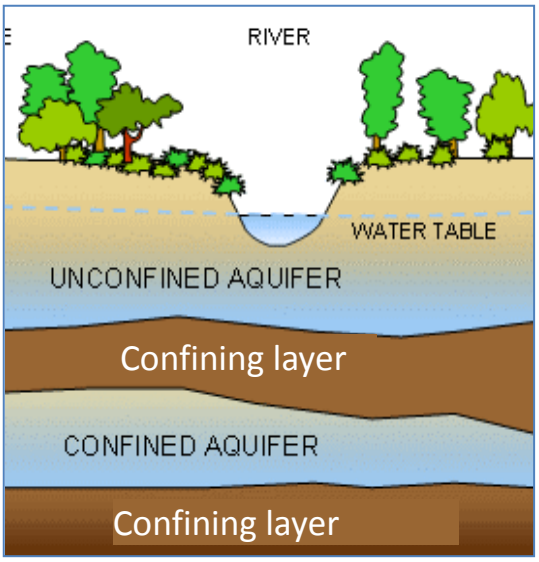
Source: AGES, Geohydrological Report, 2015

From the above-mentioned data sets groundwater levels in the area vary between 1.0 to 78.6 mbgl. The average groundwater level is approximately 23.2 mbgl (AGES, 2015).

8.5.2 Groundwater flow

An interpolation technique, using the available data, was used by AGES to simulate water levels. The results show that groundwater levels follow topography and it can be assumed that groundwater flow takes place under unconfined to semi-confined conditions (AGES, 2015). See figure below for schematic illustration of confined and unconfined aquifers.

Figure 17: Schematic illustration - Confined and Unconfined Aquifers



Source: Adapted from www. http://3-c.in/difference-confined-unconfined-aquifers/2015

8.5.3 Groundwater quality

pH and Electrical Conductivity (EC) readings were taken by AGES at four hand pump equipped community boreholes (EBH 10, 11, 12 and 15). The location of the boreholes in relation to the proposed prospecting area is indicated in Figure 16. Results indicate that the pH values range from 7.15 to 7.55 and the EC values range from 703 to 1007 mS/m.

The high EC reading range is indicative of water that has a high salinity and in accordance with the Department of Water & Sanitation (DWS) classification system classified as Class 4 (Dangerous water quality). This explained the reason why the community complained about groundwater quality in the area (AGES, 2015).

Groundwater from five additional boreholes were sampled and screened against the DWAF Water Quality Guidelines for Domestic Water Use (1996) and the South African National Standard for drinking water (SANS 241:2006).

The chemical results of the groundwater are presented in the table below.

Table 9: Water Quality Results

BOREHOLE ID	DWAF CLASSIFICATION	SANS 241 LIMITS	
		Suitability	Exceedances
EBH02	Drinking Class 2 (Marginal water quality).	Conditionally suitable for human consumption without prior treatment	The sample has a Total Hardness ($CaCO_3$) content that classifies as DWAF Class 2 at 317

BOREHOLE ID	DWAF CLASSIFICATION	SANS 241 LIMITS	
		Suitability	Exceedances
			mg/l.
EBH07	Drinking Class 1 (Good water quality)	Suitable for human consumption	Slightly elevated Total hardness and Total Dissolved Solids values
WMB2D	Drinking Class 3 (Poor water quality)	Not suitable for human consumption without prior treatment	pH > 9.7 F >1.5 mg/l
EBH4	Drinking Class 3 (Poor water quality)	Not suitable for human consumption without prior treatment	Mg > 100mg/l $CaCO_3$ > 300mg/l EC > 170 mS/m NO_3 > 11 mg/l NO_2 > 0.9 mg/l
GK11	Drinking Class 3 (Poor water quality)	Not suitable for human consumption without prior treatment	F > 1.5 mg/

Source: AGES, Geohydrological Report, 2015

It is evident from hydro chemical results that groundwater in the direct vicinity of the proposed prospecting area is of marginal to poor quality for drinking water purposes. Only one borehole located on the remaining extent of the farm Klip Berg 2158 has good water quality.

8.5.4 Groundwater quantity

Borehole yields in the area are relatively low and pump test data analysis conducted by AGES in 2015, of the two highest yielding boreholes (EBH7 and GK11) indicated that each borehole could only be pumped sustainably at 0.2 l/s for 24 hours.

According to the 1: 500 000 Hydrogeological Map Series of the Republic of South Africa (King, 1997) the groundwater in the regional area of Colenso is confined to intergranular spaces and fractures within the Karoo Formations and intergranular spaces within alluvium aquifers. The borehole yields range from 0.5 – 2.0 l/s (21).

8.6 SURFACE WATER

The proposed prospecting area falls within Water Management Area (WMA) 7 – Thukela. The Thukela WMA lies predominantly in the KwaZulu-Natal province. It is a funnel-shaped catchment, with several tributaries draining from the Drakensberg escarpment towards the Indian Ocean. It is characterized by mountain streams in the upper reaches, where several parks and conservation areas are located (Storm Water Solutions, 2015).

The Thukela WMA covers a surface area of 29 158 km^2 and yields a Mean Annual Runoff (MAR) of 3 799 Mm^3/a (million cubic meters per annum).

The proposed prospecting area falls within quaternary catchments V12G, V14B, V14D and V14E. Information concerning the catchments is listed in Table 10.

Table 10: Information concerning quaternary catchments

CATCHMENT	V12G	V14B	V14D	V14E
Area (km²)	505.9	170.1	631.8	286.6
Present ecological status according to Chapter 3 of National Water Act (1998)*	B[3]	A[4]	A	B
Mean annual runoff (mm/a)	76	67	71	83
Groundwater contribution to base flow (mm/a)	7	2	8	4

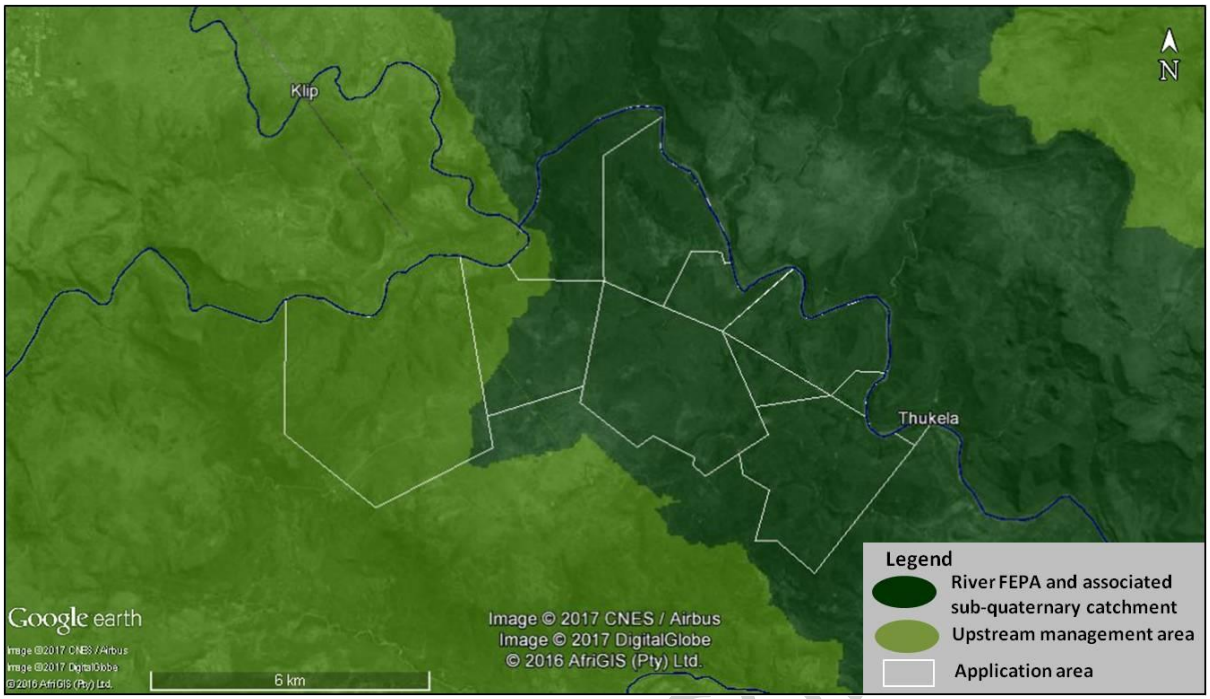
Source: AGES, Geohydrological Assessment, 2015

The Present Ecological Status (PES) of the different catchments therefore varies from “A - Unmodified, natural” to “B - Largely natural with few modifications.”

The perennial Thukela River forms the northern and eastern border of the proposed prospecting area. The Thukela River has a Freshwater Ecosystem Priority Area (FEPA) status and a Class B PES is assigned by the DWS, which means the river is largely natural with few modifications. In terms of the FEPA status it means that the river is considered intact and able to contribute towards river ecosystem biodiversity. Please refer to Figure 18 for the FEPA map. For river FEPAs the whole sub-quaternary catchment is shown in dark green, although FEPA status applies to the actual river reach within such a sub-quaternary catchment. The shading of the whole sub-quaternary catchment indicates that the surrounding land and smaller stream network need to be managed in a way that maintains the good condition (A or B ecological category) of the river reach. Upstream management areas are indicated in lighter green. These are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs.

There are also a myriad of ephemeral drainage lines bisecting the area, which only contains water for short periods after rains (Figure 19).

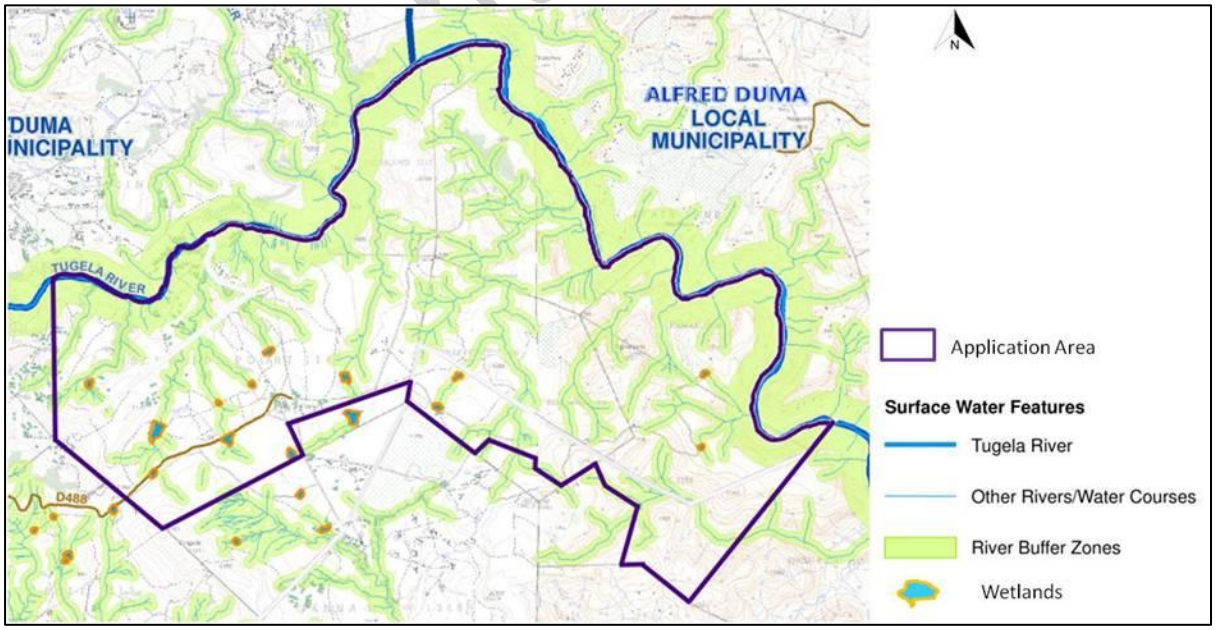
Figure 18: Freshwater Ecosystem Priority Areas



Source: NFEPA (2011), SANBI:BGIS Layer

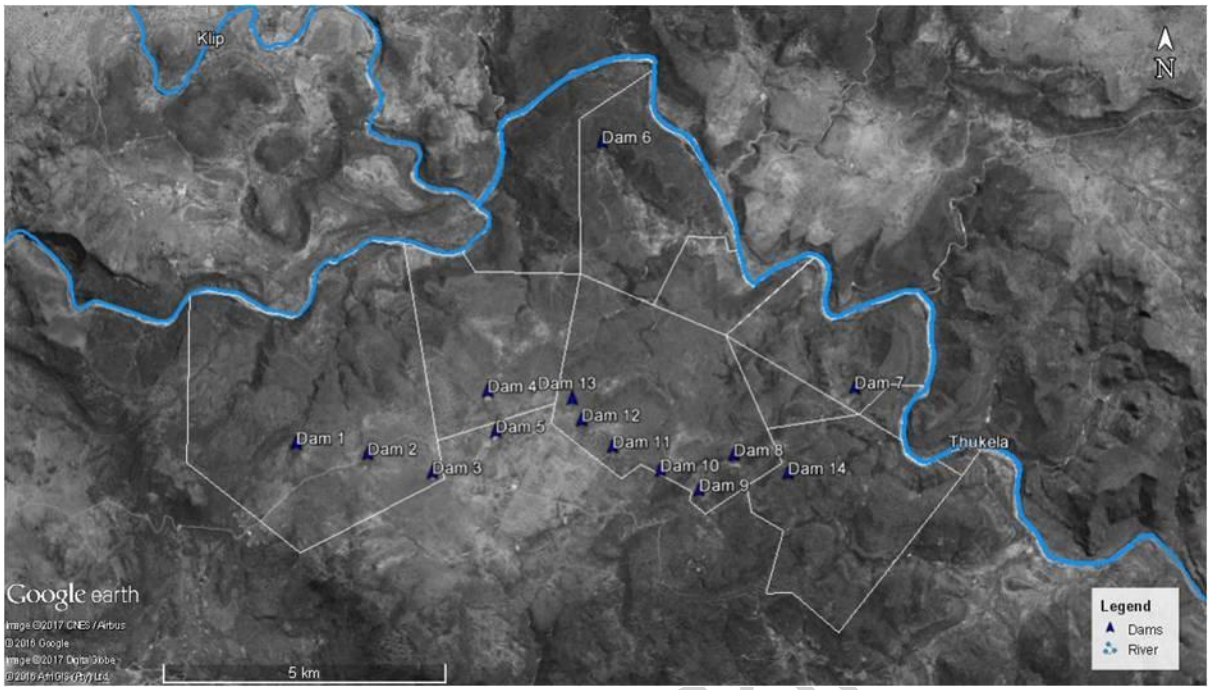
Several farm dams are situated in the general area of the proposed application area. The location of the fourteen dams most relevant to the prospecting right application is shown in Figure 20.

Figure 19: Location of watercourses



Source: SiVest, Surface Water Report (2014)

Figure 20: Location of farm dams within prospecting right area



Source: Google Earth Imagery

Figure 21: A view of Dam 1

Source: David Allan, Avifaunal Report (2015)

Figure 22: A view of Dam 2

Source: David Allan, Avifaunal Report (2015)

Figure 23: A view of Dam 4

Source: David Allan, Avifaunal Report (2015)

Figure 24: A view of Dam 5

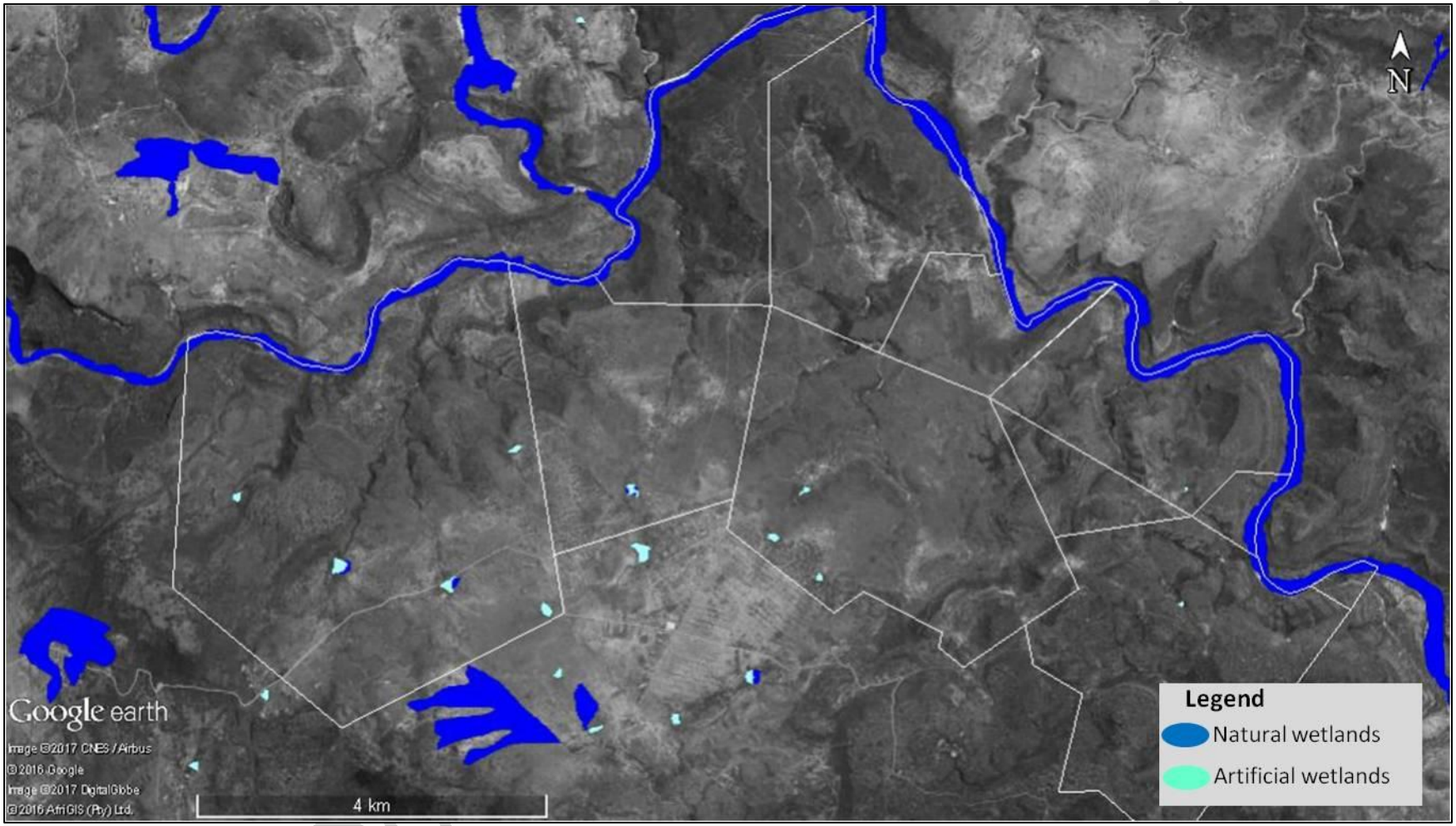
Source: David Allan, Avifaunal Report (2015)

8.7 WETLANDS

Several wetlands can be found on the application area. These wetlands correlate with the farm dams that can be found on the area and with the Thukela River (Refer Figure 25). In May 2014 SiVest conducted in-field wetland ground-truthing assessment for another project's site selection process. The largest portion of the proposed prospecting application was included in the area assessed by SiVest. Ultimately, within the study area, it was found that there are three (3) main wetland types including floodplain wetlands, valley bottom wetlands and depression wetlands (including man-made dams).

Only the wetlands associated with the Thukela River has a FEPA status. A FEPA Rank of 2 is assigned to these wetlands which means that the wetlands are located within 500m of a IUCN threatened frog species.

Figure 25: Wetlands - natural and artificial



Source: NFEPA Wetlands (2011) SANBI, BGIS Layer

8.8 SOILS

The existing land type information for the site (Bruce *et al*., 2002) shows that the proposed prospecting site is covered by three land types, namely **Fb268** on the steeper terrain and **Fb272** and **Fb273** in the other parts. The main characteristic of these areas is that the soils are shallow, red and brown sandy loams to sandy clay loams with only small areas of deeper soils and occasional surface rocks.

The general soil description for the soils is soils with minimal development, usually shallow on hard weathering rocks, with or without intermittent diverse soil and lime is generally present in part or most of the landscape.

The soils in the prospecting area falls within the following soil classes:

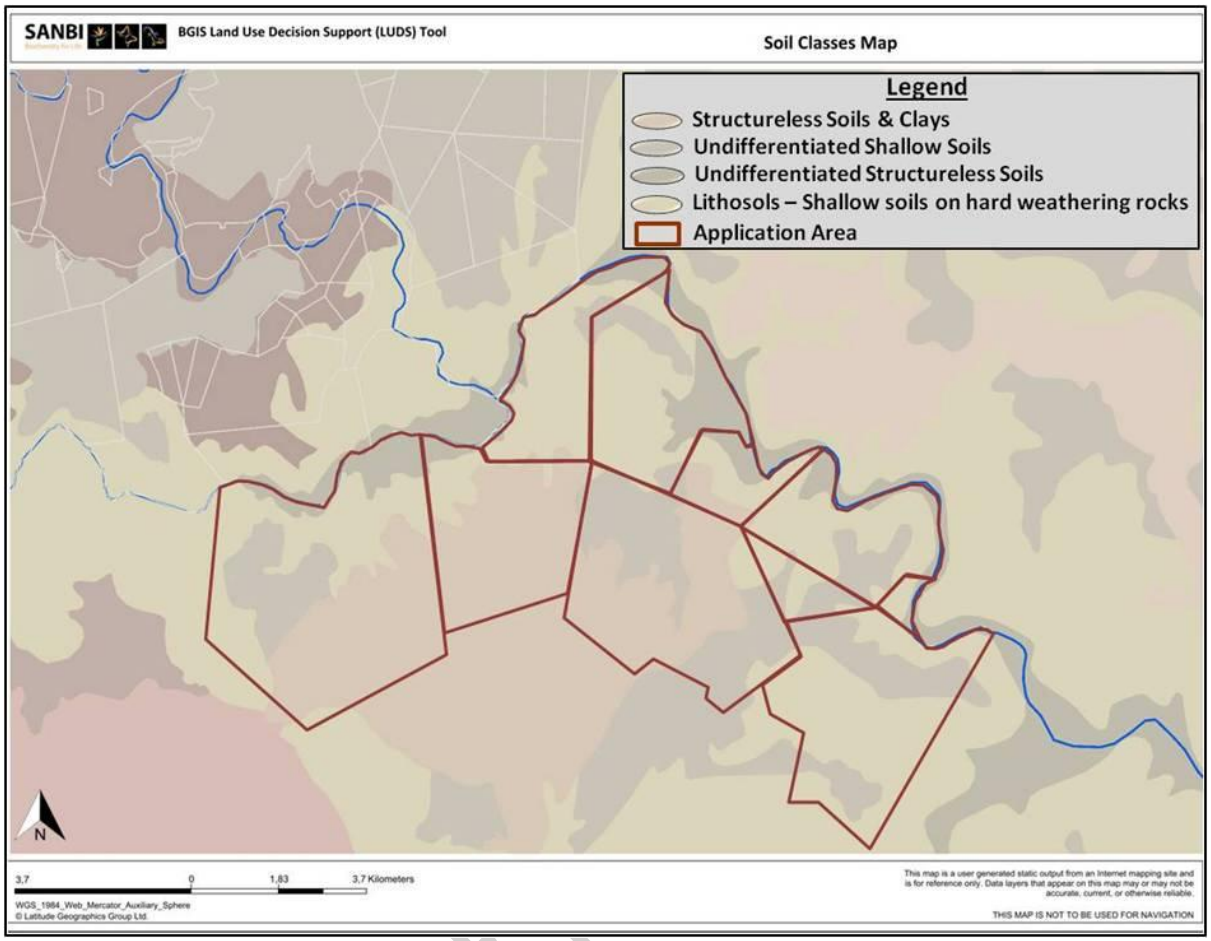
(a) Association of Classes 17 and 18: Structureless soils and clays - May have favourable physical properties or high natural fertility, restricted depth, imperfect drainage, wetness, high swell-shrink potential, plastic and/or sticky.

(b) Association of Classes 13 and 16: Undifferentiated shallow soils and land classes - Soil may receive water runoff from associated rock or water-intake areas. There are restricted land use options on these soils.

(c) Association of Classes 1 to 4: Undifferentiated structureless soils - Favourable physical properties include one or more of low base status, restricted soil depth, excessive or imperfect drainage and high erodibility.

(d) Classes 17 & 18: Lithosols (shallow soils on hard or weathering rock) - May receive water runoff from associated rock, restricted soil depth and associated with rockiness.

Figure 26: Soil Class Map

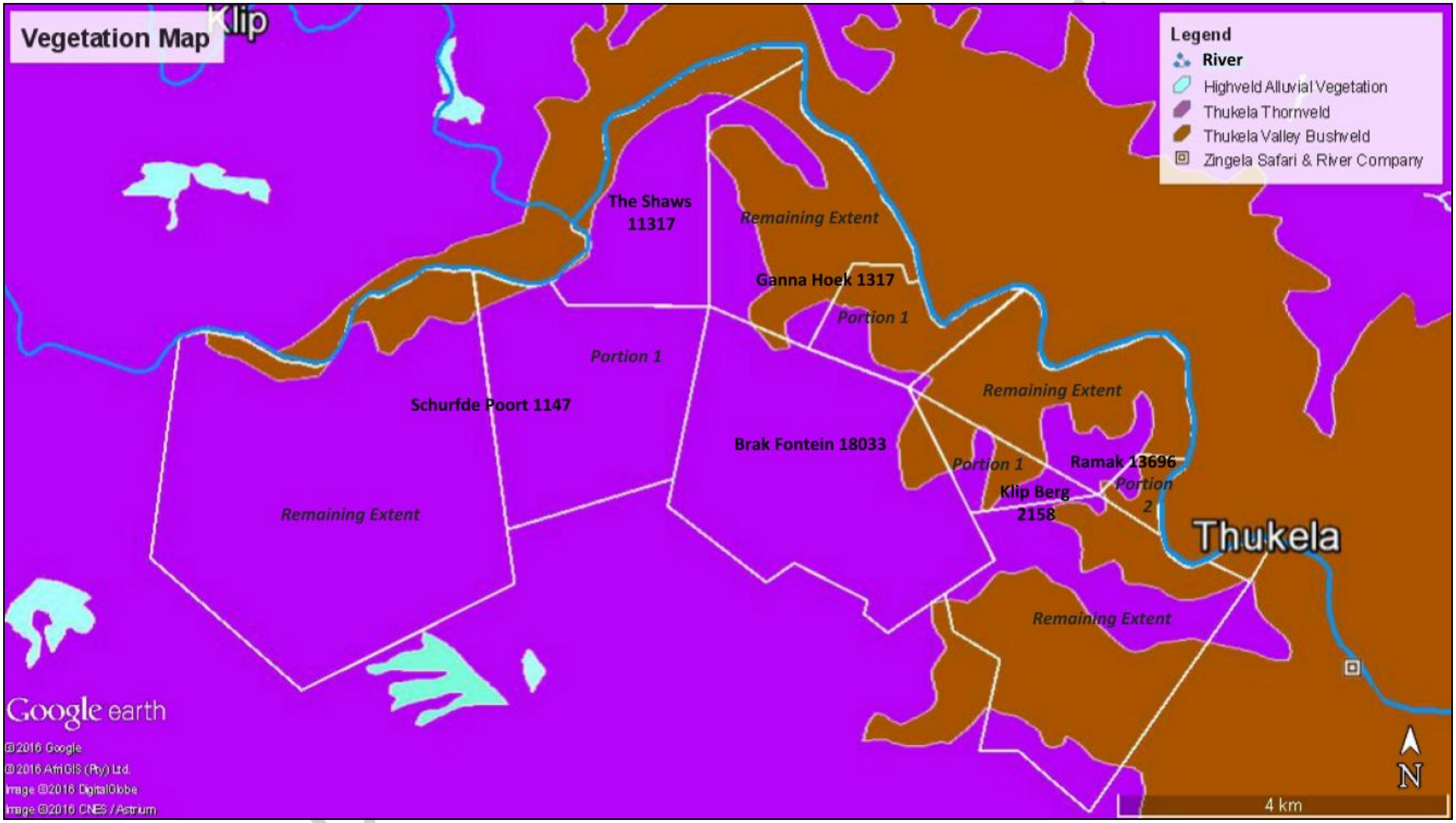


Source: Soil Class GIS Layer, SANBI BGIS

8.9 VEGETATION (FLORA)

The proposed prospecting area is located in a transitional zone between the grassland and savannah biomes (Mucina and Rutherford, 2006). Within a biome, smaller groupings referred to as bioregions can be found which provide more specific but general details as to the biophysical characteristics of smaller areas. The project areas can be found within the Sub-Escarpment Savanna and Sub-Escarpment Grassland bioregions. Going into even finer detail, vegetation units are classified which contain a set of general but more local biophysical characteristics as opposed to the entire bioregion. The proposed prospecting area is found within the Thukela Thornveld and the Thukela Valley Bushveld vegetation units (Mucina and Rutherford, 2006).

Figure 27: Vegetation Map



Source: South African National Biodiversity Institute, Vegetation GIS Layer, 2012

8.9.1 Thukela Thornveld vegetation unit

The largest portion of the of the proposed prospecting area falls within the Thukela Thornveld vegetation unit. Most of the area on the farms Schurfde poort 1147 (remaining extent and portion 1), The Shaws 1137 and Brak Fontein 18033 consist of this vegetation type. The landscape of the Thukela Thornveld vegetation unit is characterised landscape features such as valley slopes to undulating hills. Vegetation is *Acacia* dominated bushveld of variable density (ranging from wooded grassland to dense thickets) with dense grassy undergrowth (Mucina and Rutherford, 2006).

Important taxa for this vegetation unit include (d = dominant species):

(a) Small Trees: *Acacia natalitia* (d), *A. nilotica* (d), *A. sieberiana* var. *woodii, A. tortilis* subsp. *heteracantha, Allophylus melanocarpus, Boscia albitrunca, Clausena anisata, Cussonia spicata, Dais cotinifolia, Ziziphus mucronata.*

(b) Tall Shrubs: *Coddia rudis* (d), *Buddleja saligna, Clerodendrum glabrum, Euclea crispa* subsp*. crispa, Heteromorpha arborescens* var. *abyssinica, Hibiscus calyphyllus, Lippia javanica, Pachystigma macrocalyx, Rhus pentheri, R. rehmanniana.*

(c) Low Shrubs: *Barleria obtusa, Justicia flava*.

(d) Soft Shrub: *Peristrophe cernua*.

(e) Woody Succulent Climber: *Senecio brachypodus. Graminoids: Eragrostis curvula* (d), *Hyparrhenia hirta* (d), *Melinis repens* (d), *Panicum maximum* (d), *Themeda triandra* (d), *Tristachya leucothrix* (d), *Aristida congesta, Digitaria eriantha* subsp. *eriantha, Elionurus muticus, Eragrostis chloromelas, E. superba, Heteropogon contortus, Setaria sphacelata, Sporobolus pyramidalis*.

(f) Herb: *Osteospermum muricatum*.

(g) Geophytic Herb: *Sansevieria hyacinthoides*.

(h) Succulent Herb: *Aloe mudenensis.*

Biogeographically important taxa / Thukela Basin endemics associated with this vegetation unit are the small tree *Vitellariopsis dispar* and the succulent herbs *Aloe prinslooi* and *Orbea woodii* (Mucina and Rutherford, 2006).

During the notification period a I&AP indicated that the *Vitellariopsis dispar* species is present on the proposed prospecting site.

Common names for the species are Tugela Bush Milkwood (English), Tugelabosmelkhout (Afrikaans) and Umphumbulu (Zulu).

Figure 28: *Vitellariopsis dispar* (N.E. Br.) Aubrév

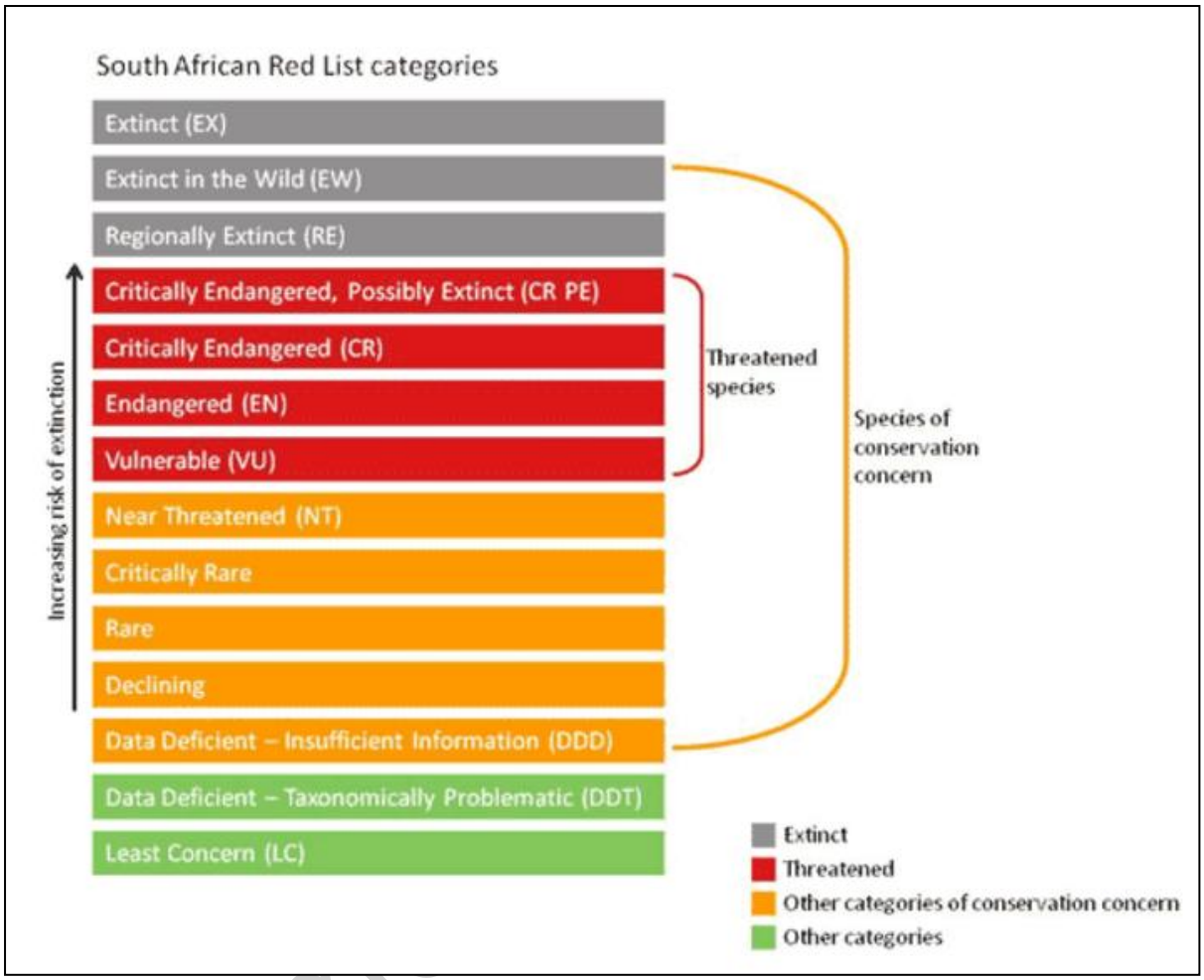
Source: http://www.ispotnature.org/node/562074

According to the IUCN Red List of Threatened Species the red data status for the species is Least Concern. The tree is found in the catchments of the central and upper Thukela and Upper Umfolozi Rivers in KwaZulu-Natal. There are two records of the species from Swaziland, but there is little information about these occurrences. The population in KwaZulu-Natal is stable and much of the habitat remains secure. There is some degree of threat from increasing settlement and local exploitation of the wood as a source of sticks and poles for building huts and the edible fruit (Hilton-Taylor, et. al., 1998).

The SANBI Red List of South African Plants indicates an increased National Status of the tree as Rare after an assessment done by J.E. Victor in 2009. See Figure 29 for the South African Red List categories. The justification for the category was that

the plant species occurs as sparsely scattered individuals, although it is not considered to be threatened (Victor, 2009).

Figure 29: South African Red List Categories



Source: http://redlist.sanbi.org/redcat.php

The Thukela Thornveld is not a threatened vegetation type and the conservation status of this vegetation type is classified as 'Least Threatened', probably as most of it falls outside areas of intensive agriculture. To date, about 5% of this vegetation type has been transformed through agricultural activities (Mucina & Rutherford 2006). This vegetation type is however poorly protected with only about 1500 ha falling within protected areas (Weenen Game Reserve and Isandlwana Nature Reserve) (Mucina and Rutherford, 2006).

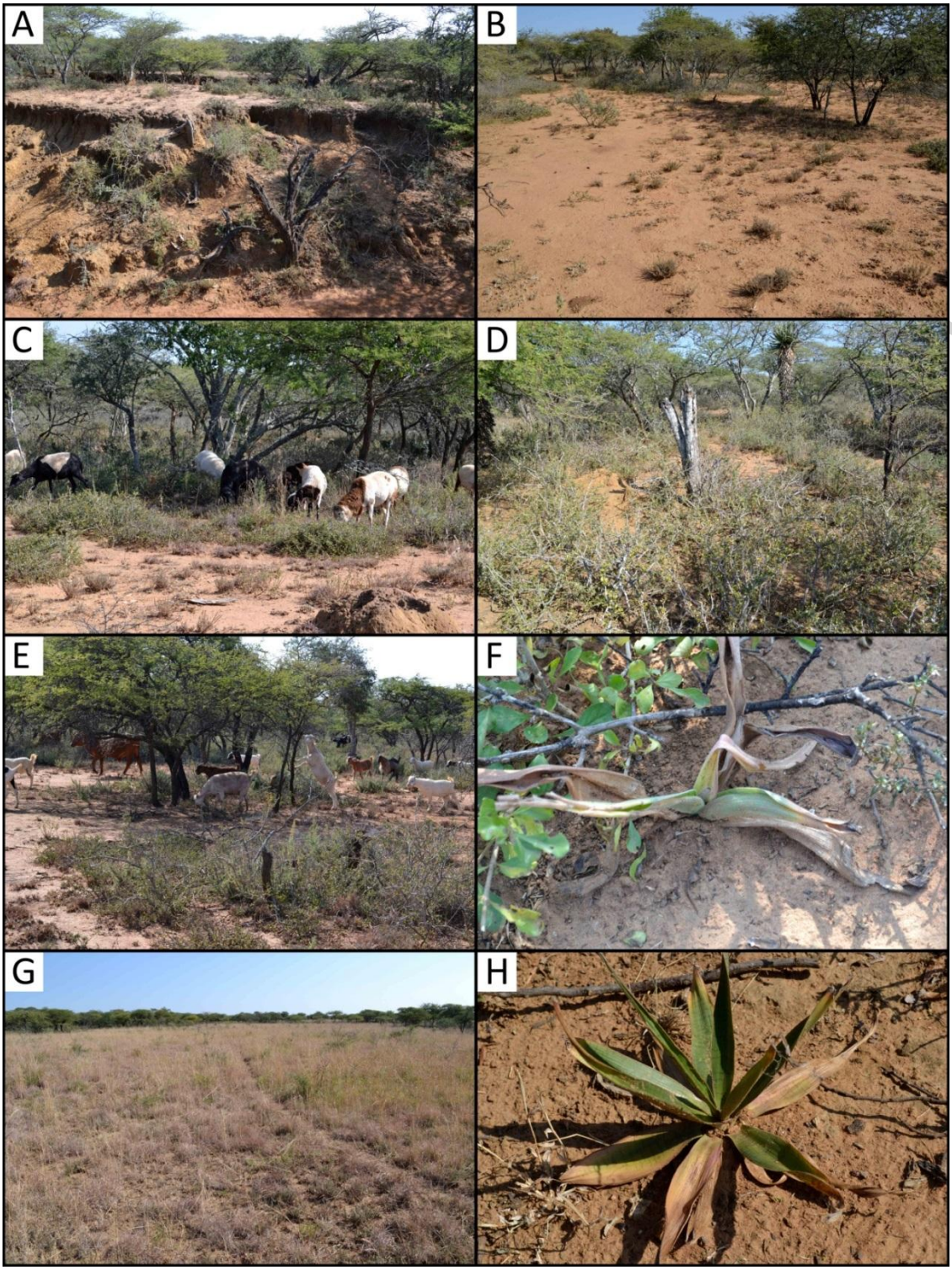
In 2015 Le Roux and Keet did a vegetation assessment on portion 1 of the farm Schurfe Poort 1147. Their field survey identified 60 plant species. Of these 56 are native to South Africa and four alien. One species of conservation concern, *Hypoxis*

hemerocallidea (Star-flower), listed as 'Declining', was present at the property. Between 10-20 individuals of a single species within the genus *Ledebouria*, within the family Hyacinthaceae (of which all members are protected under provincial legislation of KwaZulu-Natal), were also present at the site.

Overall, the site assessed was found to be of relative low conservation and biodiversity value, as evidenced by high levels of disturbance and various signs of human-mediated transformation/degradation. Small pastoral communities were present within close proximity of the study site. Signs of high levels of environmental transformation include: intensive overgrazing, as evidence by the general lack of ground cover (only woody trees present), extensive erosion gullies and high densities of livestock (sheep, cattle and goats) in the area (Le Roux & Keet, 2015).

Overgrazing on Schurfe Poort 1147 portion 1 is likely also the cause of the observed abundant element of short woody shrubs, most notably *Coddia rudis* (Small Bone-apple), and non-native alien weeds such as *Schkuhria pinnata* (Dwarf Marigold), *Solanum* (Nightshade) and *Opuntia* (Prickly Pear) species(Le Roux & Keet, 2015).

Figure 30: Representative photos of the Portion 1 of Schurfde Poort 1147



A) Large erosion gullies, B) areas with very little vegetation cover and interdispersed area of bare soil, C) herd of sheep grazing on site, D) dense bush encroachment primarily by the low shrub *Coddia rudis* (Small Bone-apple), E) herd of goats grazing on site, F) specimen of *Hypoxis hemerocallidea* (Star-flower) found at the site, G) section of grassland with signs of bush encroachment by shrubby vegetation, H) specimen of *Ledebouria* sp. (squil) found on site.

Source: Le Roux & Keet, Vegetation Assessment (2015)

8.9.2 Thukela Valley Bushveld vegetation unit

The biggest portions of farms Ganna Hoek 1317 (remaining extent and portion 1), Ramak 13696 (remaining extent and portion 2) and Klip Berg 2158 (remaining extent and portion 1) fall within this vegetation unit. The landscape of the Thukela Valley Bushveld vegetation unit is characterised with often rocky-rugged slopes and terraces mainly with deciduous trees of short to medium height (and many large shrubs) *Acacia tortilis*, *A. nilotica* and *A. Natalia* and prominent evergreen species such as *Olea europaea* subsp. Africana, *Boscia albitrunca* and *Eulcea crispa* in places. Succulent plants, mainly species of *Euphorbia* and *Aloe* occur on shallow and eroded soils. Relatively limited areas are dominated by succulents such as *E. tirucalli* (some hillsides south of the Thukela) and *E. ingens* on steep slopes, but also commonly on the valley floor (Mucina and Rutherford, 2006).

Important taxa for this vegetation unit include (d = dominant species):

(a) Tall Tree: *Sclerocarya birrea* subsp. *caffra*.

(b) Small Trees: *Combretum apiculatum* (d), *Spirostachys africana* (d), *Acacia tortilis* subsp. *heteracantha*, *Berchemia zeyheri*, *Boscia albitrunca*, *Combretum molle*, *Cussonia spicata*, *Pappea capensis*, *Schotia brachypetala*.

(c) Succulent Trees: Aloe marlothii subsp. marlothii (d), Euphorbia grandidens (d), *E. tirucalli* (d), *E. ingens*, *E. triangularis*.

(d) Tall Shrubs: *Coddia rudis* (d), *Dichrostachys cinerea* (d), *Euclea crispa* subsp. *crispa*, *E. schimperi*, *Gymnosporia buxifolia*, *Heteromorpha arborescens* var. *abyssinica*, *Olea europaea* subsp. *africana*, *Rhus pentheri*, *Vitex rehmannii*.

(e) Low Shrubs: *Barleria obtusa*, *Gymnosporia glaucophylla*.

(f) Soft Shrubs: *Hypoestes aristata* (d), *Peristrophe cernua*.

(g) Succulent Shrub: *Huernia hystrix* subsp. *hystrix*.

(h) Woody Climbers: *Asparagus falcatus*, *Jasminum multipartitum*.

(i) Woody Succulent Climber: *Sarcostemma viminale*.

(j) Graminoids: *Heteropogon contortus* (d), *Melinis repens* (d), *Panicum maximum* (d), *Themeda triandra* (d), *Aristida congesta*, *A. diffusa*, *Cymbopogon pospischilii*, *Eragrostis chloromelas*, *E*. *curvula*, *Panicum deustum*, *Urochloa mosambicensis*.

(k) Succulent Herbs: *Aloe mudenensis*, *Bulbine narcissifolia*, *Duvalia polita*, *Orbea woodii*.

Biogeographically important taxa / Thukela Basin endemics associated with this vegetation unit are the small tree *Vitellariopsis dispar* and the succulent herbs *Aloe prinslooi* and *Orbea woodii*.

The Thukela Valley Bushveld is not a threatened vegetation type and the conservation status of this vegetation type is classified as 'Least Threatened'. This vegetation type is poorly protected with less than 200 ha statutory protected in the Weenen Game Reserve. This vegetation unit has undergone considerable degradation over almost its entire area. In the many eroded areas, prolonged continuous overgrazing has led to the complete destruction of the grass cover. Often the only ground cover is found under *Acacia tortilis* trees where their root systems retain soil, the trees act as nutrient pumps and provide shade (Camp 1999e). Erosion is variable, ranging from very low to very high. Alien plants include the widely scattered *Opuntia imbricata* (Mucina and Rutherford, 2006).

The woodland in the proposed prospecting area ranges from open woodland with a prominent grass layer and scattered thorn trees to very dense, almost impenetrable areas of thick scrub. Large trees are generally scarce. The woodland becomes progressively denser from the west to the east. The densest woodland is found in the Thukela River valley. In places the woodland has been impacted by wood collection, with some areas almost cleared of trees. The grass layer has been visibly impacted by grazing, and in some areas, bush densification is evident (Van Rooyen and Froneman, 2014).

Figure 31: Woodland vegetation

Source: Le Roux & Keet, Vegetation Assessment (Unpublished)

8.10 ANIMAL LIFE (FAUNA)

The conservation status of species for all taxa groups is based on categories determined by the International Union for Conservation of Nature (IUCN) (IUCN 2016), namely:

(a) Critically Endangered (CR) – the species is considered to be facing an extremely high risk of extinction in the wild, based on IUCN criteria.

(b) Endangered (EN) – the species is considered to be facing a very high risk of extinction in the wild, based on IUCN criteria.

(c) Vulnerable (VU) – the species is considered to be facing a high risk of extinction in the wild, based on IUCN criteria.

(d) Near Threatened (NT) – when evaluated against IUCN criteria, does not qualify for a Threatened category but is close to qualifying for or is likely to qualify in one of those categories in the near future.

(e) Data Deficient (DD) – there is inadequate information regarding the species' population size, distribution or threats for an assessment to be made.

This system is designed to determine the relative risk of extinction, with the main purpose being to catalogue and highlight those taxa that are facing a high risk of global extinction. Species listed as Critically Endangered (CR), Endangered (EN) and Vulnerable (VU) collectively are considered as Threatened (IUCN 2016).

These threatened species are published in 'Red Data Lists' reports, with the aim of identifying and highlighting those species most in need of conservation attention as well as to provide an index of the state of degeneration of biodiversity.

8.10.1 Mammal species predicted to occur

Data on mammal species listed in Table 11 was obtained from the Red Data Book of Mammals of South Africa, the Emnambithi Ladysmith Local Municipality: Strategic Environmental Planning Tool, and Smither's Mammals of Southern Africa (2000).

Table 11: Red Data mammals predicted to occur in the prospecting area

SCIENTIFIC NAME	COMMON NAME	STATUS
Chrysospalyx villosus	Rough-haired Golden Mole	Critically Endangered
Myosorex varius	Forest Shrew	Endangered
Crocidura flavescens	Greater Red Musk Shrew	Endangered
Poecilogale albinucha	Striped Weasel	Rare
Ourebia ourebi	Oribi Antelope	Vulnerable
Orycteropus afer	Aardvark	Vulnerable
Mystromys albicaudatus	White Tailed Mouse	Vulnerable
Amblysomus hottentotus	Hottentot Golden Mole	Data Deficient

Source: Van Der Merwe, Faunal Assessment (2015)

8.10.2 Reptiles predicted to occur

Data on reptile species of conservation importance was based on information obtained from the Emnambithi Ladysmith Local Municipality: Strategic Environmental Management Tool, the EKZNW Strategic Environmental Assessment Report, and the EKZNW Minset Database for the area. The species predicted to occur on the site are summarised in Table 12.

Table 12: Red Data reptile species predicted to occur in the prospecting area

SCIENTIFIC NAME	COMMON NAME	STATUS
Bradypodion thamnobates	Natal Midlands Dwarf Chameleon	Near threatened
Bradypodion melanocephalum	Black-Headed Dwarf Chameleon	No entries found
Scelotes bourquini	Bourquin's Dwarf Burrowing Skink	No entries found

Source: Van Der Merwe, Faunal Assessment (2015)

8.10.3 Amphibians predicted to occur

The Strategic Environmental Management Tool for the Emnambithi Ladysmith municipality indicates that Long-Toed Tree Frog (*Leptopelis xenodactylus*) and Natal Spiny Reed Frog (*Afrixalus spinifrons*) may occur in the study area.

Table 13: Red Data amphibian species predicted to occur in the study area

SCIENTIFIC NAME	COMMON NAME	STATUS
Leptopelis xenodactylus	Long-Toed Tree Frog	Endangered
Afrixalus spinifrons	Natal Spiny Reed Frog	Vulnerable

Source: Van Der Merwe, Faunal Assessment (2015)

8.10.4 Avifauna / Birds

In 2014 Chris van Rooyen Consulting conducted a scoping level avifaunal impact assessment study for a development in the area. The majority of the proposed prospecting area falls within the area assessed.

The authors have travelled and worked extensively on avifaunal impact assessment projects across South Africa since 1996, including several in KwaZulu-Natal. Personal observations of avifauna and bird/habitat associations have therefore been used to supplement the data that is available from SABAP1 and 2 (Van Rooyen and Froneman, 2014).

8.10.4.1 Important bird areas and other avifaunal focal points

Since the late 1970s, more than 12,000 Important bird areas (IBAs) have been identified in virtually all of the world's countries and territories, both on land and at sea. In 1998, 122 South African IBAs were identified and listed in Barnes (1998). This inventory was revised to 112 IBAs in 2015 (Marnewick et al. 2015).

According to the 2015 IBA directory Spioenkop Nature Reserve is the closest IBA (approximately 37 km to the west) to the proposed prospecting site. The Spioenkop Nature Reserve is a fully protected area in terms of the National Environmental Management: Protected Areas Act (Act 57 of 2003) and is defined as a Sub-regional IBA. Sub-regional IBAs are recognised by BirdLife South Africa and meet sub-regional thresholds in the IBA C1 and C4 criteria (Marnewick et al. 2015):

(a) C1 Criteria - The site regularly holds significant numbers of a nationally threatened species, or other species of national conservation concern.

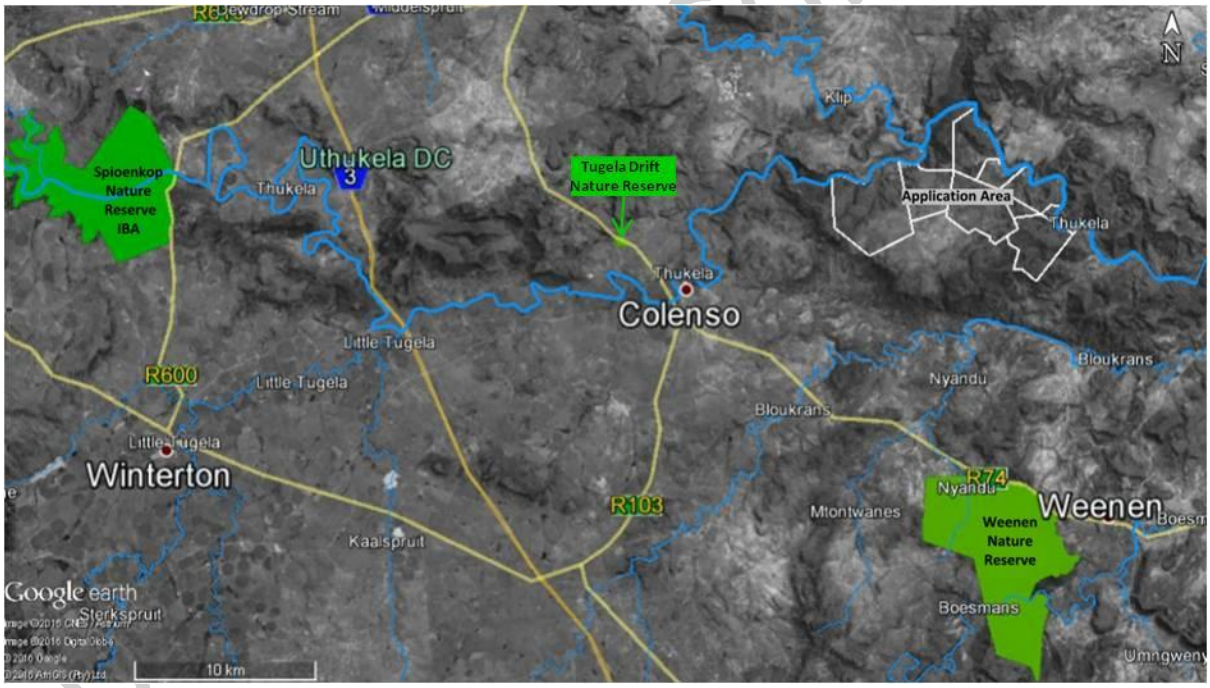
(b) C4 Criteria - A site may qualify on either of the following criteria:

(i) The site is known or thought to hold, on a regular basis (at least once in five years), >0.5% of a biogeographic population of a congregatory waterbird species.

(ii) The site is known or thought to hold, on a regular basis, >10 000 waterbirds of one or more species.

Weenen Nature Reserve, also a formally protected provincial nature reserve is located approximately 13.5 km south of the proposed prospecting area. Although not recognised as an IBA the reserve can be seen as an avifaunal focal point in the local area.

Figure 32: Location of application area in relation to Spioenkop & Weenen Nature Reserves



Source: BGIS Protected Areas GIS Layer & Google Earth

8.10.4.2 Bird populations

A total of 358 bird species were recorded in the Quarter Degree Squares investigated by Van Rooyen and Froneman (2014) of which 29 are classified as Red Data species. Table 14 lists the Red Data species that could potentially be encountered in the proposed prospecting area. The likelihood of occurrence in the respective habitat types within the study area is also indicated.

Table 14: Species of conservation concern potentially occurring in the study area

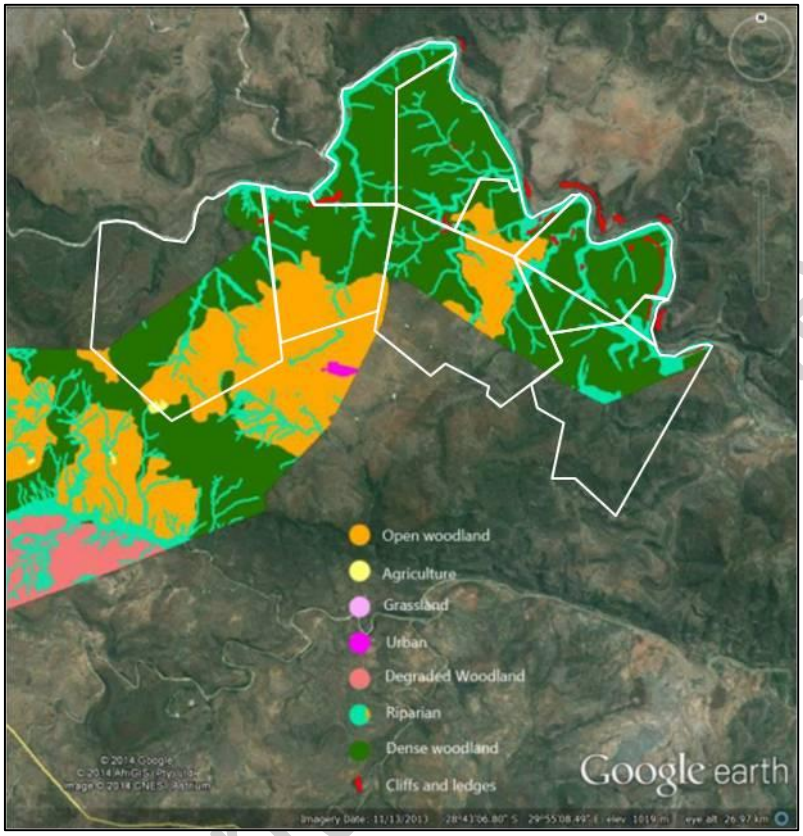
NAME	SCIENTIFIC NAME	Red data status	SABAP1	SABAP2	Riparian	Cliffs	Open woodland	Dense woodland	Degraded woodland
African Marsh-Harrier	*Circus ranivorus*	EN	*						
Black Harrier	*Circus maurus*	EN	*						
Cape Vulture	*Gyps coprotheres*	EN	*	*		Low	Low	Low	Low
Grey Crowned Crane	*Balearica regulorum*	EN	*	*					
Lappet-faced Vulture	*Torgos tracheliotus*	EN		*			Low	Low	Low
Martial Eagle	*Polemaetus bellicosus*	EN	*	*	High		Medium	Medium	Medium
Southern Ground-Hornbill	*Bucorvus leadbeateri*	EN	*	*	Medium	Medium	Medium	Medium	Medium
Tawny Eagle	*Aquila rapax*	EN	*	*	Low		Low	Low	Low
White-backed Vulture	*Gyps africanus*	EN		*	Low		Low	Low	Low
Yellow-billed Stork	*Mycteria ibis*	EN	*		High				
Black-bellied Bustard	*Lissotis melanogaster*	NT	*	*			High	Low	Low
Blue Crane	*Anthropoides paradiseus*	NT	*	*			Low		
European Roller	*Coracias garrulus*	NT	*	*			High	Low	Low
Greater Flamingo	*Phoenicopterus ruber*	NT	*		Low				
Half-collared Kingfisher	*Alcedo semitorquata*	NT	*		High				
Lesser Jacana	*Microparra capensis*	NT	*		Low				
Maccoa Duck	*Oxyura maccoa*	NT	*		Low				
African Crowned Eagle	*Stephanoaetus coronatus*	VU	*		Medium	Medium			
African Grass-Owl	*Tyto capensis*	VU	*						
Black Stork	*Ciconia nigra*	VU	*	*	High	High			
Denham's Bustard	*Neotis denhami*	VU	*						
Greater Painted-snipe	*Rostratula benghalensis*	VU	*	*	Medium				
Lanner Falcon	*Falco biarmicus*	VU	*	*		High	Medium	Low	Low
Secretarybird	*Sagittarius serpentarius*	VU	*	*			High		
Southern Bald Ibis	*Geronticus calvus*	VU	*	*		Medium			
Verreaux's Eagle	*Aquila verreauxii*	VU	*			Low			
White-backed Night-Heron	*Gorsachius leuconotus*	VU	*		Medium				
White-bellied Korhaan	*Eupodotis senegalensis*	VU	*	*		Medium			

CR = Critically Endangered EN = Endangered VU = Vulnerable NT = Near threatened

Source: Van Rooyen and Froneman (2014)

The figure below indicates the location of the application area in relation to the specific bird habitats identified by Van Rooyen and Froneman (2014).

Figure 33: Location of application area in relation with bird habitats identified by Van Rooyen & Froneman (2014)



Source: Based on Van Rooyen and Froneman (2014)

In 2015 David Allan, Curator of Birds at the Durban Natural Science Museum, conducted a specialist avifauna assessment for a project in the area proposed on Schurfde Poort 1147 Portion 1. Not the entire proposed prospecting application area was assessable to the specialist.

Seventeen records of Red Data birds of four different species were recorded at 15 different localities in the direct project area and immediately adjacent areas of relevance during two-day field surveys. These four Red Data bird species were: White-bellied Korhaan, Lanner Falcon, Southern Bald Ibis and Black Stork. All four are regarded as regionally 'Vulnerable' (see shaded records in Table 14). Of these four species, only the endemic Southern Bald Ibis is also considered as globally threatened (global category also 'Vulnerable') (Allan, 2015).

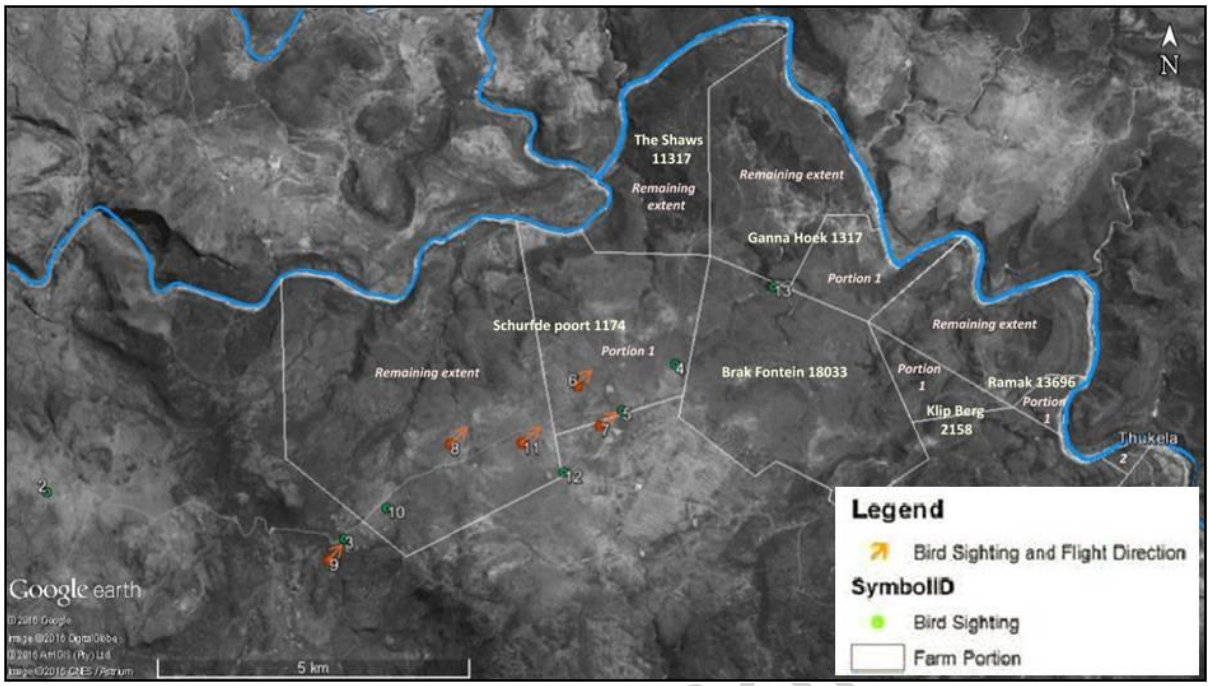
Details of the records of these four species are provided in Table 15 and the localities of these records and of other features of avifaunal relevance are shown in Figure 34.

Table 15: Details of records of the four Red Data bird species recorded by Allan (2015)

SIGHTING LOCALITY NO.	DATE	RED DATA BIRD SPECIES	DETAILS
1	8 Aug. 2015	Southern Bald Ibis	5 foraging in natural grassland (Near Colenso - not on map)
2	8 Aug. 2015	Southern Bald Ibis	1 perched on wooden power pylon
3	8 Aug. 2015	Lanner Falcon	Pair of adults perched on wooden pylon below Monte Cristo
4	8 Aug. 2015	White-bellied Korhaan	Heard calling
5	8 Aug. 2015	Lanner Falcon	1 adult perched
6	8 Aug. 2015	Southern Bald Ibis	3 flying towards north-east
7	8 Aug. 2015	Southern Bald Ibis	1 flying towards north-east
8	8 Aug. 2015	Southern Bald Ibis	2 flying towards north-east
9	10 Aug. 2015	Southern Bald Ibis	3 flying through Cingolo Nek towards north-east
10	10 Aug. 2015	Lanner Falcon	1 juvenile perched
11	10 Aug. 2015	Southern Bald Ibis	2 flying towards north-east
12	10 Aug. 2015	White-bellied Korhaan	Group of 3 flushed
13	10 Aug. 2015	Lanner Falcon Southern Bald Ibis Black Stork	Pair of adults at cliff, likely breeding At least 3 visible on cliff, likely breeding 1 at nest on cliff
14	10 Aug. 2015	Southern Bald Ibis	At least 20 on cliff likely breeding
15	10 Aug. 2015	Lanner Falcon	Pair of adults flying in front of cliff on Monte Cristo, likely breeding, and chasing a juvenile

Source: David Allan, Avifaunal Report (2015)

Figure 34: Localities of records of the four Red Data bird species



Source: David Allan, Avifaunal Report (2015)

8.11 BIODIVERSITY

The KZN Biodiversity Plan (KZN BP) provides a spatial representation of land and coastal marine area required to ensure the persistence and conservation of biodiversity within KZN, reflected as Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA). The Plan has been produced as a tool for:

(a) guiding protected area expansion priority areas and identification of stewardship sites and;

(b) informing all other economic sector strategic spatial planning processes with the intention of ensuring more sustainable development in KZN.

(c) It also informs other internal EKZNW strategic processes such as alien clearing programme prioritisation, informs District Conservation Officer priorities, and

(d) informs the decisions and nature of response to development applications by the Integrated Environmental Management Unit (Ezemvelo KZN Wildlife, 2016).

The mapping of Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) is undertaken firstly at a provincial scale, with the development of the four

Systematic Conservation Assessments (SCA) namely, Marine SCA, Estuarine SCA, Freshwater SCA and Terrestrial SCA, which are combined with other supporting information to form a Draft KZN Biodiversity Plan (KZN BP). Mapping then shifts to a district scale wherein the Draft KZN BP information is cut to district scale and refined by input of local knowledge to develop district specific Biodiversity Sector Plan (BSP). The BSP is then used as a framework for the development of the district Bioregional Plan (BRP) and other spatial planning tools. The site verified information is collated and included within the BSP is fed back into the next iteration of KZN Systematic Conservation Assessments (Ezemvelo KZN Wildlife, 2016).

The aim of a Biodiversity Sector Plan is to:

(a) Identify and map critical biodiversity assets in KwaZulu-Natal District Municipalities.

(b) Provide associated management guidelines which aim to maintain the integrity of these biodiversity features.

The objectives of the Biodiversity Sector Plan are to:

(a) Ensure aquatic and terrestrial biodiversity targets are met at the District level.

(b) Conserve representative samples of biodiversity pattern.

(c) Conserve the ecological and evolutionary processes that allow biodiversity to persist over time; and

(d) Serve as a first step towards the development of a Bioregional Plan.

The key purpose of the BSP is to assist and guide land use planners and managers within various district and local municipalities, to account for biodiversity conservation priorities in all land use planning and management decisions, thereby promoting sustainable development and the protection of biodiversity, and in turn the protection of ecological infrastructure and associated ecosystem services (Ezemvelo KZN Wildlife, 2015).

According to the UThukela Biodiversity Sector Plan (2015) there is an area at the west side of the application area on Portion 1 of the farm Gannahoek 1317 that is classified as a CBA Irreplaceable. According to the KZN Terrestrial Systematic

Conservation Plan Minimum Selection Surface Layer (2010) the top features that occur in the unit, giving the area its irreplaceability value are as follows:

(a) FEATURE_1 - Sensitive Species (Restricted).

(b) FEATURE_2 - *Doratogonus falcatus* - A millipede with an IUCN conservation status of Least Concern.

(c) FEATURE_3 - *Gulella orientalis* - A snail species endemic to KZN.

(d) FEATURE_4 - Thukela Valley Bushveld - Vegetation unit not considered threatened.

(e) FEATURE_5 - Thukela Thornveld - Vegetation unit not considered threatened.

(f) FEATURE_6 - *Cochlitoma simplex* - Thukela Agate Snail- An endemic species with a very localised distribution in the province, abundance is unknown, *C. simplex* has been recognised by Ezemvelo KZN Wildlife as a species of conservation concern (Granger, 2015).

(g) FEATURE_7 - *Gulella orientali*-A snail species endemic to KZN.

(h) FEATURE_8 - *Zinophora mudenensis* - A milipede.

There are several small areas scattered within the boundary of the proposed prospecting site that are classified as CBA Optimal. Please refer Figure 35.

CBA Irreplaceable are areas which are required to meet biodiversity conservation targets and where there are no alternative sites available (Category driven by species and feature presence) and CBA Optimal are areas that are the most optimal solution to meet the required biodiversity conservation targets while avoiding high cost areas as much as possible (Category driven primarily by process). The land use management objective for both these areas is to maintain the areas in a natural state with limited to no biodiversity loss and these areas are to be buffered by 30 m (Ezemvelo KZN Wildlife, 2015).

The UThukela Biodiversity Sector Plan (2015) also identified local corridors and Ecological Support Areas (ESAs). Several local corridors were identified in the

UThukela District based on the requirement to link Protected Areas, stewardship sites and CBAs to landscape corridors while avoiding modified land.

Terrestrial Ecological Support Areas (ESAs) within the UThukela District were mapped and defined according to the following data:

(a) Landscape and local corridors.

(b) Specialist or expert input data.

(c) Species specific habitat requirements.

Terrestrial Ecological Support Areas (ESAs) are areas that are functional but not necessarily entirely natural terrestrial that are largely required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the Critical Biodiversity Areas. The areas also contribute significantly to the maintenance of Ecological Infrastructure. The land use management objective for Terrestrial ESAs is to maintain ecosystem functionality and connectivity allowing for some loss of biodiversity (Ezemvelo KZN Wildlife, 2015).

Approximately 75% of the proposed prospecting site falls within areas identified as ESAs. These areas coincide with the local corridors identified for the district. Please see Figure 36.

In order to facilitate the integration of the identified biodiversity criteria/information into the more general town planning processes, a guideline matrix has been included in the UThukela Biodiversity Sector Plan (2015) to enable the cross-walking of the terminology from the different spatial planning sectors. In addition, the matrix also provides guidelines as to the suitability/compatibility of different potential land use categories relative to the various conservation categories.

According to the matrix the land use classified as "Extractive Industry / Quarrying and Mining" is not recommended for CBA Irreplaceable, CBA Optimal and ESA areas.

According to Section 24 (2) of NEMA The Minister, or an MEC with the concurrence of the Minister, may identify:

(b) geographical areas based on environmental attributes, and as specified in spatial development tools adopted in the prescribed manner by the Minister or MEC, with the concurrence of the Minister, in which specified activities may not commence without environmental authorisation from the competent authority;

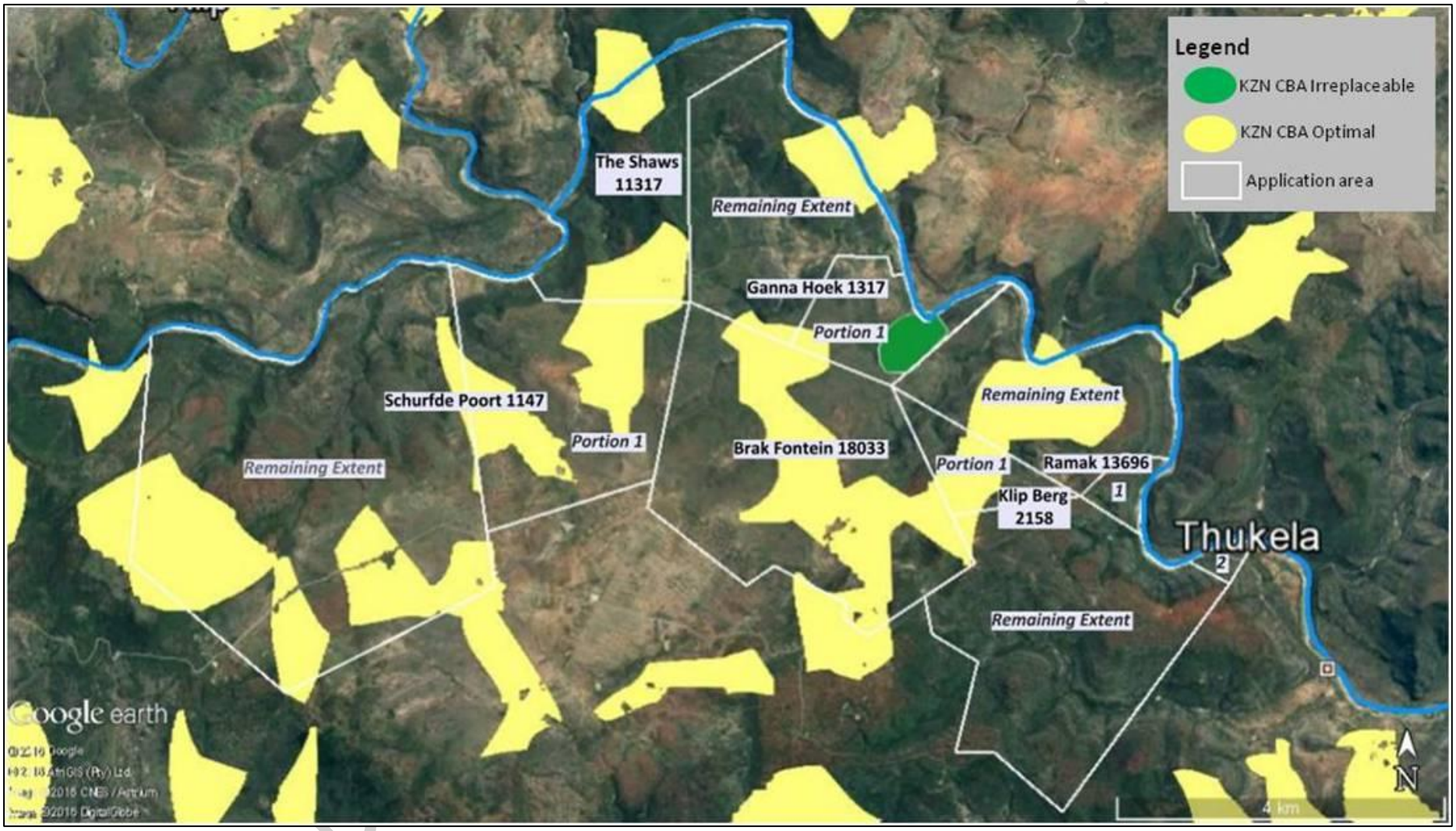
(c) geographical areas based on environmental attributes, and specified in spatial tools or environmental management instruments, adopted in the prescribed manner by the Minister or MEC, with the concurrence of the Minister, in which specified activities may be excluded from the requirement to obtain an environmental authorisation from the competent authority.

To this end the Minister of Environmental Affairs, published Listing Notice 3 of 2014 in GN 984 of 4 December 2014 which was amended by GN 324 of 7 Apr 17.

The geographical areas specified for the listed activity applicable to this application (Activity 12) for KwaZulu-Natal include CBAs as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. Note that Ecological Support Areas are not identified as a specific geographical area and therefore development in these areas are not governed under Listing Notice 3.

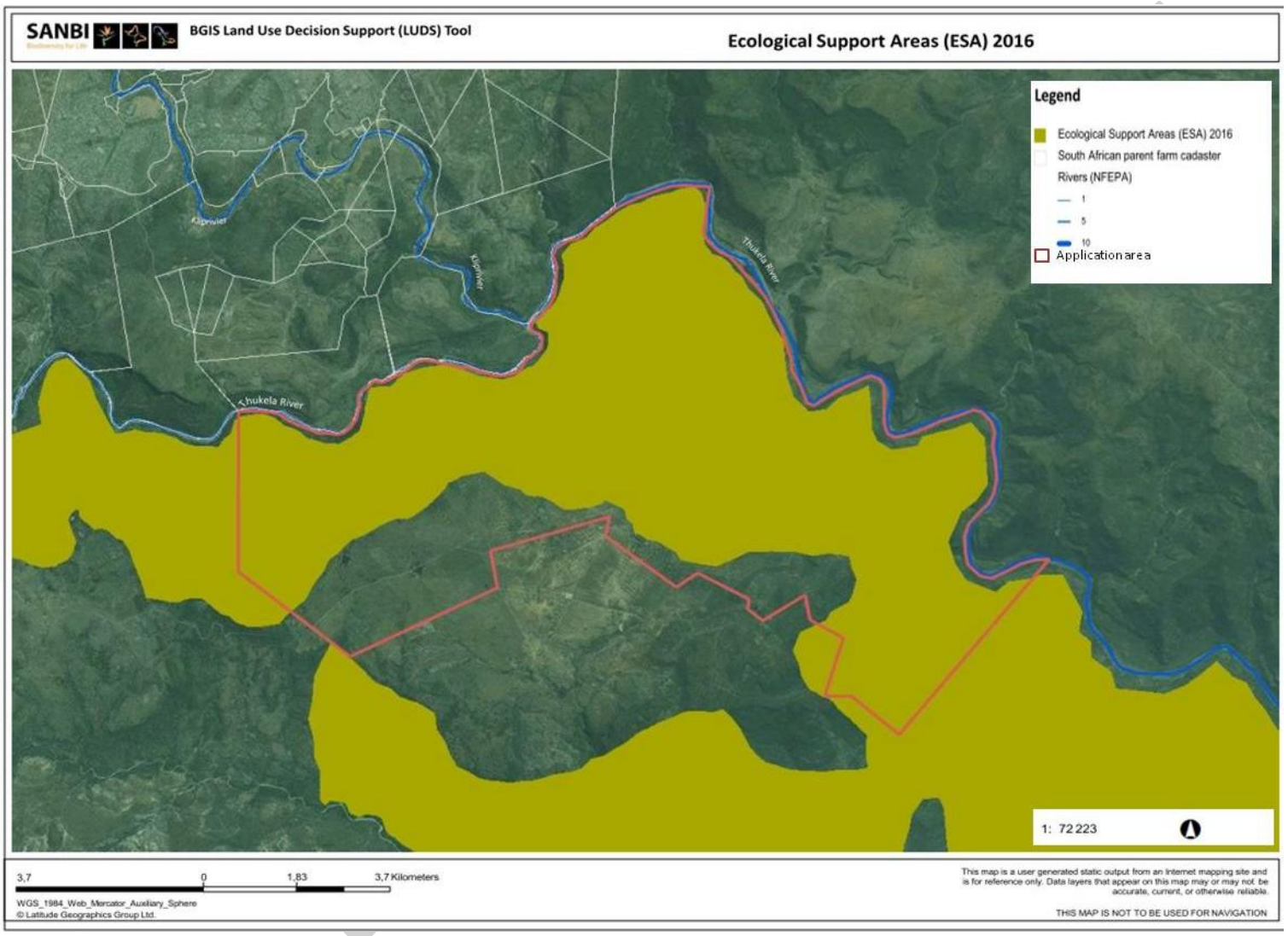
This application includes application for authorisation for the applicable Listing Notice 3 activity for the clearance of more than 300 square metres or more of indigenous vegetation in the CBAs.

Figure 35: KwaZulu Natal Terrestrial Critical Biodiversity Areas



Source: Ezemvelo KZN Wildlife, UThukela Biodiversity Sector Plan (2015)

Figure 36: KwaZulu-Natal Ecological Support Areas



Source: *Ezemvelo KZN Wildlife, KZN Biodiversity Spatial Planning Terms and Processes (2016)*

8.12 SENSITIVE ENVIRONMENTS

8.12.1 Ecosystem Status

The National Department of Environmental Affairs (DEA) has published a list of threatened terrestrial ecosystems (DEA, 2011), which classifies all threatened or protected ecosystems in South Africa in terms of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), or Protected. The purpose of categorising these ecosystems was to prioritise conservation areas, to reduce the rates of ecosystem and species extinction, as well as to prevent further degradation and loss of structure, function and composition of these ecosystems (www.bgis.sanbi.org)

Four vulnerable ecosystems have been identified in the UThukela District. The proposed prospecting area does not fall in one of these threatened ecosystems.

8.12.2 Protected Areas

The Uthukela District has five provincial nature reserves as well as the Maloti Drakensberg WHS Park. Weenen Nature Reserve (4,183 ha) is located approximately 13.5 km south of the proposed prospecting area and the Tugela Drift Nature Reserve (41 ha) is located approximately 11.4 km to the west of the site (refer Figure 32).

8.12.3 Mining and Biodiversity Guideline, 4 October 2012

The Mining and Biodiversity Guideline & associated maps were developed to facilitate the sustainable development of South Africa's mineral resources in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity and ecosystem services. The document was approved by MINMEC on 4 October 2012 and was formally launched in 2013.

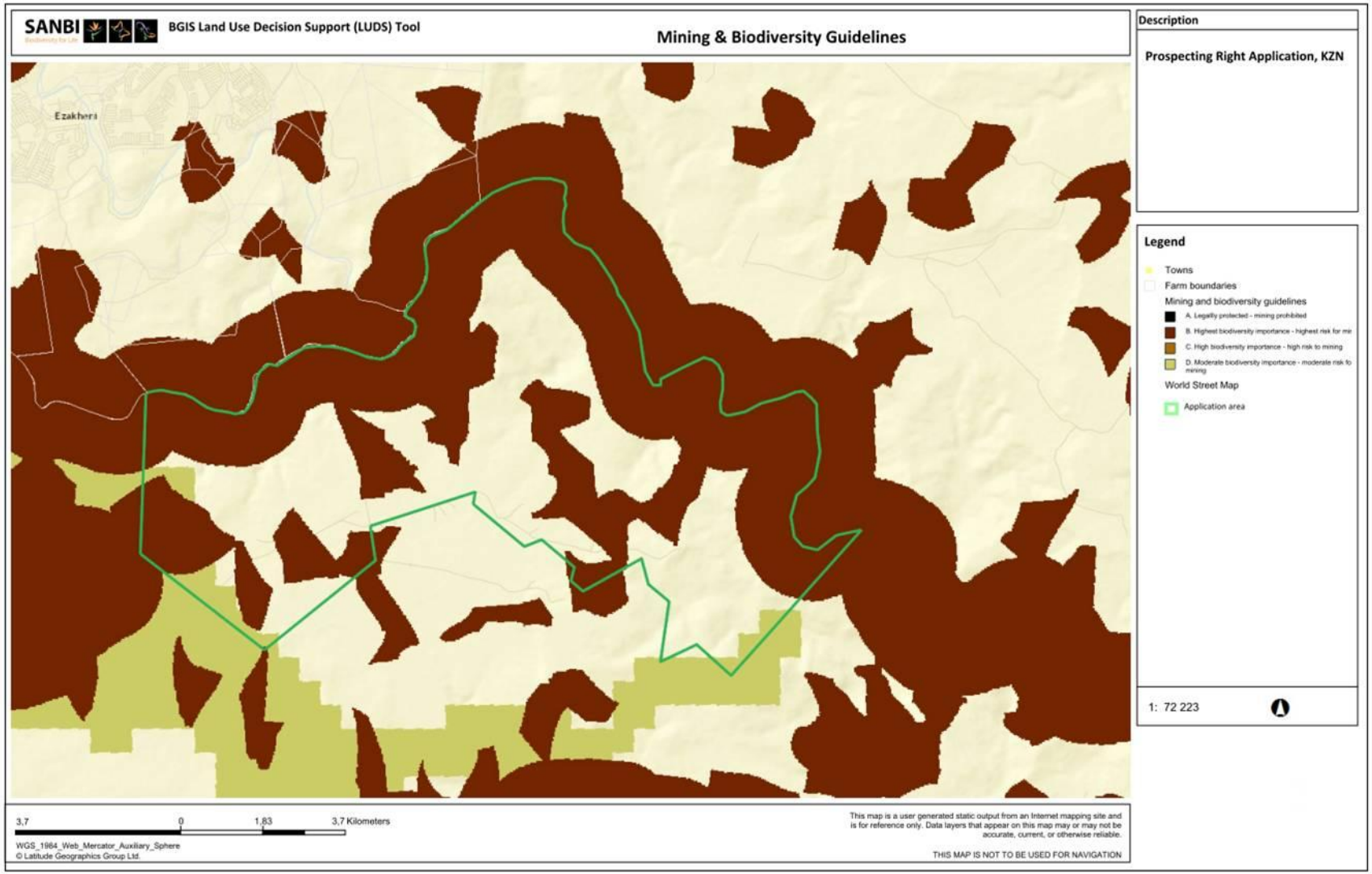
The Guideline provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during the operational phases of a mine, from exploration through to closure. The Guideline provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining (Department of Environmental Affairs, Department of Mineral Resources, Chamber

of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute, 2013).

The Guideline distinguishes between four categories of biodiversity priority areas in relation to the importance from a biodiversity and ecosystem service point of view as well as the implications for mining. It gives direction on how to avoid, minimise or remedy mining impacts, as part of a thorough environmental impact assessment and robust environmental management programme. The mitigation of negative impacts on biodiversity and ecosystem services is a legal requirement and should take on different forms depending on the significance of the impact and the area being affected. Mitigation requires proactive planning that is enabled by following the mitigation hierarchy. Its application is intended to avoid disturbance of ecosystems and loss of biodiversity, and where they cannot be avoided altogether, to minimise, rehabilitate or offset negative impacts on biodiversity (Department of Environmental Affairs *et.al.,* 2013)

The map below indicates the classification of the proposed prospecting area in accordance with the Mining and Biodiversity Guideline. The Thukela River together with its associated buffer resulted in the whole northern boundary of the proposed prospecting area to be classified as being of highest biodiversity importance. Other areas that are classified as having highest biodiversity importance is associated with the CBA Irreplaceable and CBA Optimal areas identified in the UThukela Biodiversity Sector Plan (2015). The remainder of the proposed prospecting area is not classified as having any biodiversity importance with apart from two small areas on the eastern and western boundaries which is of moderate biodiversity importance (see Figure 37).

Figure 37: Mining Biodiversity Guideline Map



Source: Mining Biodiversity Guideline 2013; SANBI BGIS

8.13 SOCIO-ECONOMIC ENVIRONMENT

The application area for the prospecting right is located on Ward 20 of Inkosi Langalibalele Local Municipality (ILLM) which is situated within the uThukela District in the KwaZulu-Natal Province. Inkosi Langalibalele Local Municipality was established in August 2016 by the amalgamation of the Imbabazane and uMtshezi Local Municipalities. The major towns in the Inkosi Langalibalele municipality are Estcourt and Weenen and Colenso and Ladysmith near the area. Weenen town is one of the main agricultural areas producing vegetables, citrus, groundnuts and lucerne also known as alfalfa. The application area for the prospecting right is strategically located in a province and district municipality that has plans to expand the mining sector and revive coal fired power stations (KZNPPC, 2016).

According to the 2016/2017 KZN 237 Integrated Development Plan, the population of Inkosi Langalibalele Local Municipality (ILLM) is 196,277. This figure was derived by combining the populations of the two municipalities that make up the Inkosi Langalibalele Local Municipality. This elaborated in the table below:

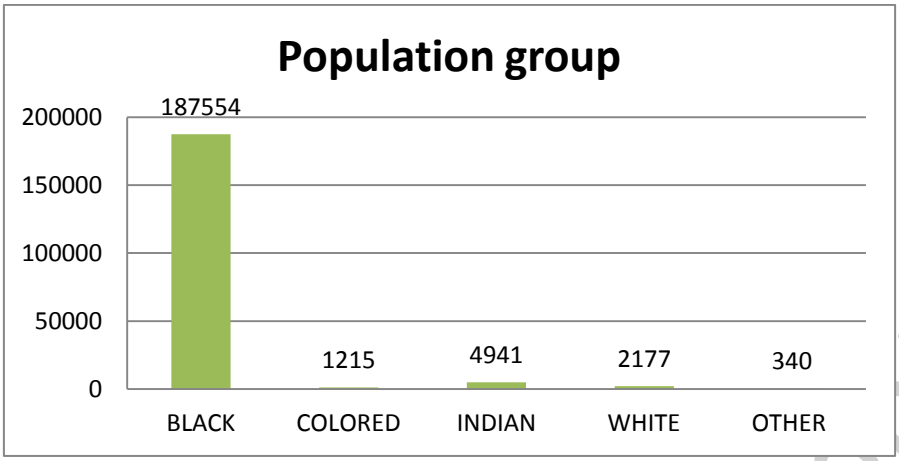
Table 16: Inkosi Langalibalele Local Municipality Population size

Local municipality	Population
uMtshezi Local Municipality	83,154
Imbabazane Local Municipality	113,073
Inkosi Langalibalele Local Municipality	196,277

Source: (StatsSA, 2011).

The area is predominantly rural with a majority of black people making up most of the population within the municipality. The graph below indicates the distribution by ethnicity. StatsSA (2011) demonstrated that females account for 53% of the population whilst males account for 47%.

Figure 38: Populations Groups

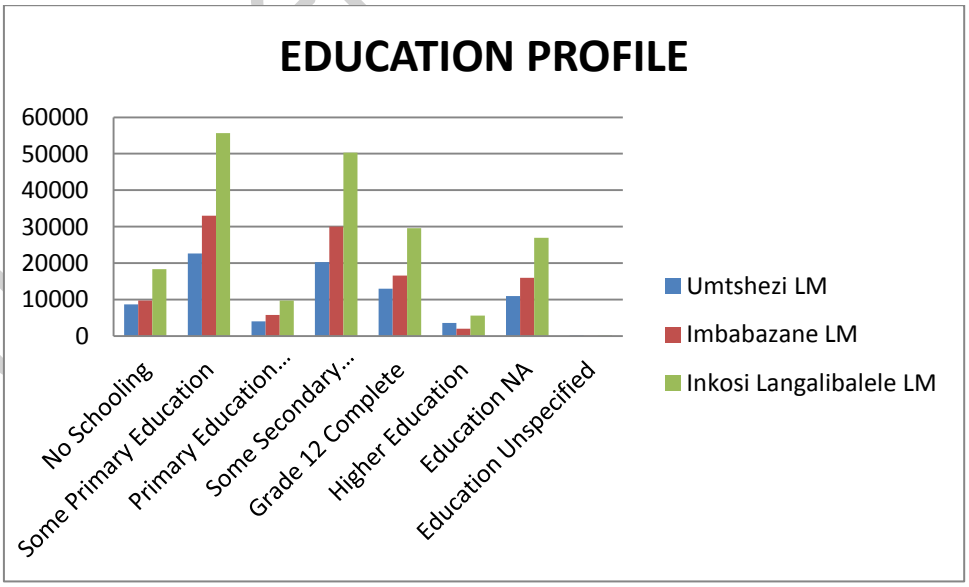


Source: (StatsSA, 2011).

Education is one of the key drivers of community development and economic activities. It provides a set of basic skills for development, creativity and innovative abilities of individuals within communities. StatsSA (2011) also estimates that the ILLM has a population of 18,356 (9.35%) individuals without formal education and only 2.8% with tertiary education. The majority of the population has some high school education but not a matric certificate.

The graph shows the educational levels of the old municipalities as combined to form ILLM.

Figure 39: Education profile



Source: (StatsSA, 2011).

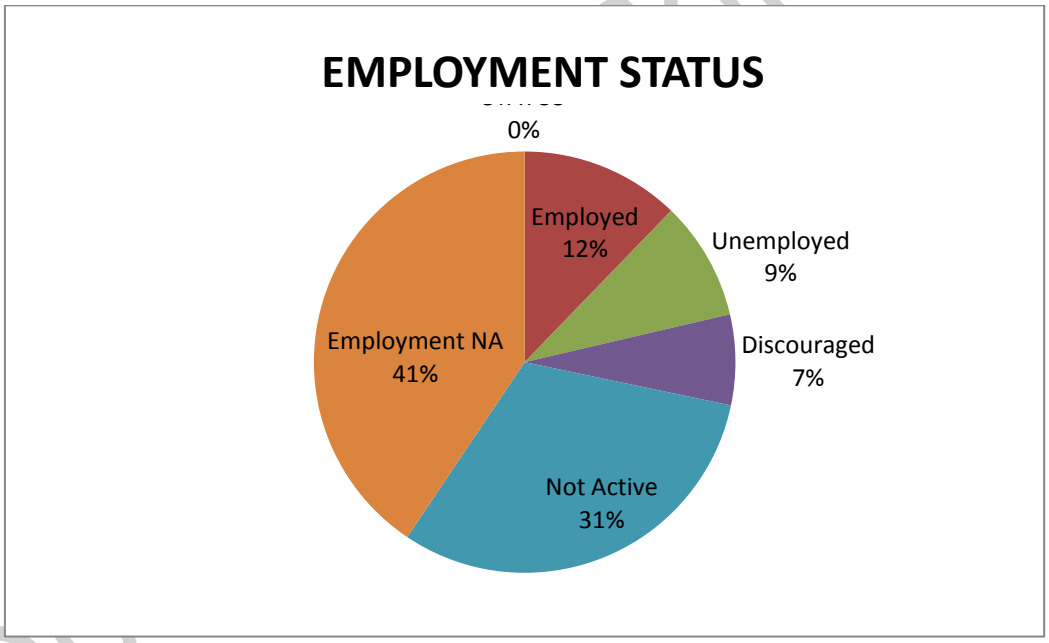
Inkosi Langalibalele LM consists of well-established industrial, commercial and residential areas. In the former uMtshezi LM; the main source of employment in 2011

was wholesale and retail trade, catering and accommodation at 28%. The second highest source of employment was in general government at 19%; followed by community, social and personal services at 16% and manufacturing was the fourth highest economic and employment contributor (uMtshezi Local Municipality, 2013). A large portion of the population (74%) had a monthly household income less than R3 200. The unemployment levels of the municipality decreased from 25% in 2001 to 13% in 2011 (uMtshezi Local Municipality, 2013).

The former Imbabazane Local Municipality had a very high unemployment rate at 48,6% (StatsSA, 2011). The majority of the Imbabazane LM households (12,653) were dependent on agriculture for income and employment.

The graph below depicts the overall employment status of Inkosi Langalibalele LM.

Figure 40: Employment status of Inkosi Langalibalele LM



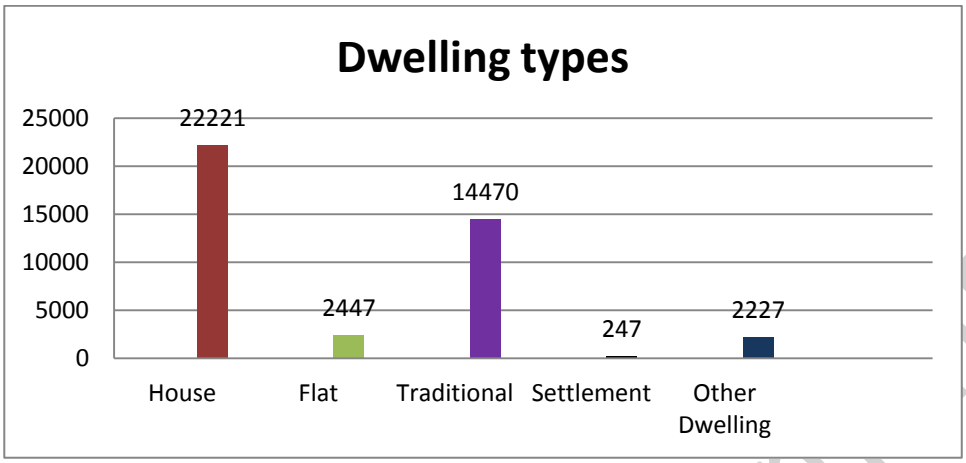
Source: (StatsSA, 2011)

The municipality had over 16% of the households without any form of income and 22% earning between R19, 601 - R38,200 annually.

The majority of surrounding communities have proper housing and access to water and electricity. However, there are invasions by informal settlers creating slums and informal dwellings. The Municipality is in a process of engaging with the invaders and informal land allocators to encourage the formalization of the existing informal settlements and to discourage future land invasions (KZN 237, 2016).

Graph of the various dwelling types in ILLM (StatsSA, 2011).

Figure 41: Dwelling types

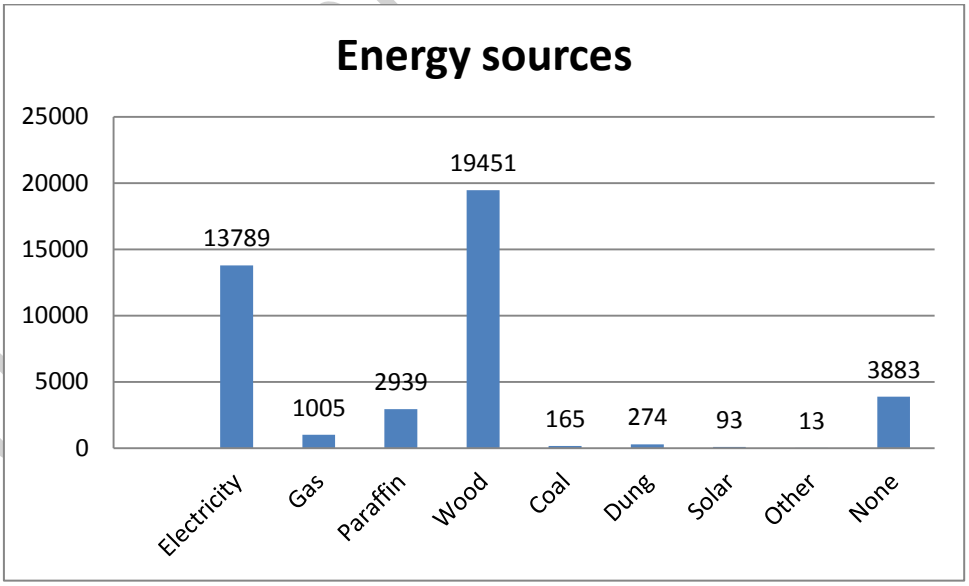


Source: (StatsSA, 2011)

Most South African households use a mix of energy sources including electricity, liquid petroleum gas, coal, paraffin, firewood, candles and solar energy (HESASA, 2017) for household uses such as lighting, cooking and heating. The population of Inkosi Langalibale LM is largely dependent on wood and electricity for energy.

The graph below shows the various energy sources used.

Figure 42: Energy sources



Source: (StatsSA, 2011).

8.14 CULTURAL ENVIRONMENT

A Heritage Scoping Report was compiled by PGS Heritage in 2014 for a site selection process for a possible development in the area. Table 17 provides the background to the known archaeological and historical heritage of the region.

Table 17: Archaeological and historical heritage background

DATE	DESCRIPTION
2.5 million to 250 000 years ago	*The Earlier Stone Age* - No information on recorded sites in the immediate study area was located during the desktop study.
250 000 to 40 000 years ago	*The Middle Stone Age* – No information on recorded sites in the immediate study area was located during the desktop study.
40 000 years ago to the historic past	*The Later Stone Age* – No information on recorded sites in the immediate study area was located during the desktop study. Although no sites could be identified through the literature review it is known (eThembeni, 2009) that remains and artefacts of the San (hunter-gatherers) are present in the north-western Natal landscape and is most prominent in the form of rock art.
AD 200 - 900	*Early Iron Age* – No information on recorded sites was located in the immediate study area was located during the desktop study.
AD 900 - 1300	*Middle Iron Age* – No information on recorded sites was located in the immediate study area was located during the desktop study.
AD 1300 - 1840	*Battle of Bloukrans* – 17 February 1838 The Great Trek that started in 1838 resulted in the conflict between the Zulu, under Dingane, and the Voortrekkers under their leader Piet Retief. The resultant massacre of Retief and his party by Dingane on 6 February 1838 lead to numerous battles and skirmishes over the next year. These include, Ithaleni, Blood River, Saailager, Rensburg Koppie, Veglaer and Bloukrans. After the massacre of Retief, Dingane dispatched his impi to kill all remaining Boer parties. On the night of 16 February 1838, the laager at Bloukrans was surrounded and attacked on the morning of 17 February 1838. Approximately 282 Voortrekkers and 250 servants were killed (http://en.wikipedia.org/wiki/Weenen_massacre).
AD 1840 and onwards	*Historic period* <u>Establishment of Colenso</u> Colenso was established as a wagon stop in 1855 at Commando Drift a crossing on the Tugela River. This crossing being on the main road between the then Colony of Natal and the Republic of the Orange Free State and the South African Republic. The Bulwer bridge was constructed in 1879 along with a tol house to cross the Tugela and in 1886 the railway bridge was opened to the east of the Bulwer bridge <u>The South African War (Boer War)</u> Colenso and the crossings of the Thukela River played a major part in the first part of the South African War (1899-1902). Between December 1899 and February 1900 a number of battles and skirmishes took place on the Natal front around Colenso. The Boer forces occupied and blocked the road and railway lines to the

DATE	DESCRIPTION
	north of the Thukela River toward the town of Ladysmith, which the Boer forces besieged from the 2nd of November of 1899. Due to the defeat of the British forces at Stormberg and Magersfontein in the week of 11 December 1899, general Buller wanted to push through the Boer lines and relieve the town of Ladysmith as soon as possible. The boer forces under the command of General Louis Botha, entrenched themselves over a 12 kilometer front on the northern side of the Thukela river just north of the town of Colenso. Gen. Buller laid a plan of attack that required a frontal assault through a loop in the river as well as a flanking attack from the east on Hlangwane Hill, 3 kilometers to the east of Colenso. The attack on Punt Drift (at the ford in the river loop) resulted in 500 casualties. At the same time two batteries of field guns under Colonel Long were deployed close to Colenso town. The open position of the naval guns resulted in heavy casualties as the Boer artillery opened fire on their position. The entrenched Boer positions gave the British forces no quarter for advance and Buller gave the orders for retreat. By the end of the battle Col. Long's field guns were all captured, Buller's army lost 143 killed, 756 wounded and 220 captured. Boer casualties were 8 killed and 30 wounded (http://en.wikipedia.org/wiki/Battle_of_Colenso). <u>Battle of Thukela Heights – 14-24 February 1900</u> The battle of Thukela Heights was a series of military actions resulting in the army of Gen. Buller lifting the siege of Ladysmith. After the defeat at Colenso and the subsequent defeat of British forces at Spioenkop and Vaalkrantz, Buller prepared a plan that would require and attack of various positions before being able to cross the Thukela River. This plan of attack culminated in battles at: (a) Hlangwane Hill – 19 February 1900 (b) Monte Cristo – 18 February 1900 (c) Cingolo Hill – 17 February 1900 (d) Horseshoe Hill – 21 February 1900 (e) Wynne's Hill – 21 February 1900 (f) Hart's Hill – 23 February 1900 (g) Pieters Hill – 27 February 1900 The Boer forces retreated on 28 February, leaving a wake of destructed bridges and railway lines (Breytenbach, 1969) <u>Colenso Power Station</u> The Colenso Power Station was constructed by the South African Railway Administration for the electrification of the Natal main line between the Glencoe Junction and Pietermaritzburg. The implementation of the line and power station took place in June 1926. The construction commenced in November 1922 and by 1925 construction was completed (http://heritage.eskom.co.za/colenso/colensomain.htm). During the same time the barrage in the Tugela river was completed by 1926.

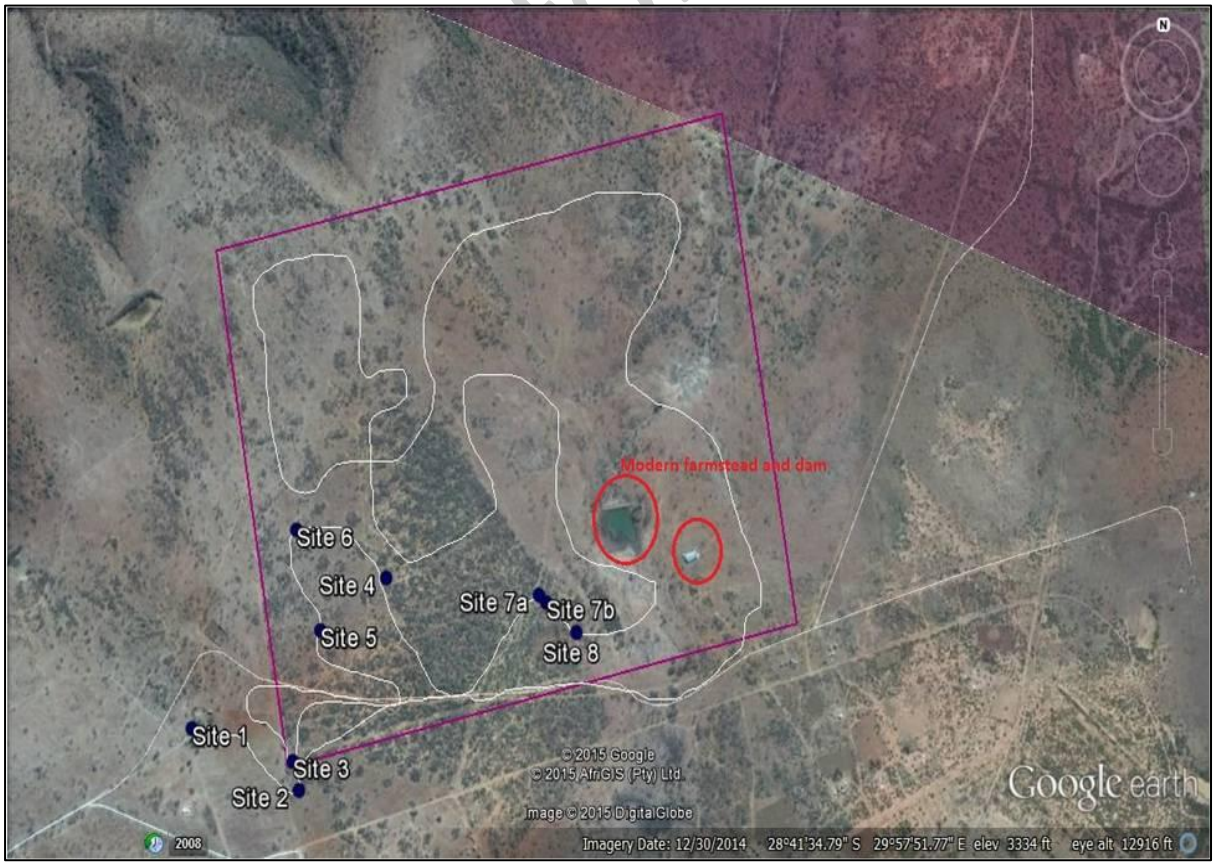
DATE	DESCRIPTION
	In January 1927 the power station was taken over by Escom with a number of buildings and other additions done over the years up to its decommissioning in 1985.

Source: PGS, Heritage Scoping Report (2014)

APelser Archaeological Consulting (APAC) conducted Phase 1 Heritage Assessments in 2015 for proposed developments in the area. One assessment covered Portion 1 of Schurfde Poort 1147 and the other assessment covered a larger area to the west and included a portion of Schurfde Poort 1147 Portion 1 & a portion of the Remainder; The Shaws 11317, Gannahoek 1313 Portion 1 & the Remainder, a portion of Brak Fontein 18033, Klip Berg 2158 Portion 1 & the Remainder and Ramak 13696 Portion 2 & the Remainder. For the purposes of this description these areas will be called Area 1 & 2.

The figure below provides an indication of the location of the heritage sites identified on Schurfde Poort 1147 Portion 1 (Area 1).

Figure 43: Aerial view showing sites recorded & tracks followed during assessment on Area 1



Source: APAC Phase 1 HIA (2015a)

The figure below provides an indication of the location of the heritage sites identified on Area 2.

Figure 44: Heritage sites recorded on Area 2

Source: APAC Phase 1 HIA (2015b)

Site 1 - Farmstead: This site contains a farmstead and related outbuildings, of which some were built of sandstone. The age of the buildings is not known but is likely less than 60 years of age and not of any heritage significance. Some rondavels are present, and the farmstead and related structures probably formed part of the Tugela Game Ranch located here (APAC, 2015a).

Sites 2 & 3 - Possible Graves: Both these features are stone packed, without any headstones though, and are the size and shape typical of graves. One of the stone cairns (Site No.3) has a ploughshare on it, another object sometimes associated with graves. Social consultation should be undertaken to determine if these are indeed graves and if there are any further low, stone-packed or unmarked graves in the study area (APAC, 2015a).

Sites 4; 5 & 8 – Single piece of pottery (4), broken lower grinding stone (5) & broken upper grinder (8): All three finds are out of context (not associated with an identified settlement in the area), but probably related to Later Iron Age habitation and activities. The pottery piece is very small and undecorated and cannot be used to

determine the relative age of the material finds and the cultural identity of the occupants of the area. Because these objects are out of context their archaeological significance is low (APAC, 2015a).

Site 6 – Stone platform: This could be a granary stand or a small enclosure of which the wall had collapsed. An upper grinding stone (site 8) was found in close proximity of this feature. No other stone walling were recorded in the immediate area (APAC, 2015a).

Site 7 – Stone Age tool scatter: This site consists of a low density scatter of individual MSA/LSA stone tools and flakes located in and around an erosion donga in the area. These dongas are caused by overgrazing and by livestock tracks cutting through the area (APAC, 2015a).

Site 9 – Stone walling/Iron Age settlement: This site contains stone walling (livestock enclosures; stone cairns; possible terracing) and other features such as a large kraal and midden deposit. Pottery, upper and lower grinding stones are also found on the site. This site, as is many of the others found in the area, is fairly extensive and most likely date to the Later Iron Age period (AD1300-AD1800's) (APAC, 2015b).

Sites 10 & 22 – Stone Age tool scatters (Open-air sites): Both these sites are located in erosion dongas in the area, and contain MSA/LSA tools such as scrapers, flake-tools, cores and smaller chips and flakes. Iron Age pottery are found in some cases as well here, but these are related to stone walling and other Iron Age features recorded as separate sites in the vicinity. The stone tools density is fairly low. It is however possible that more tools might be found during development actions, and it is recommended that surface sampling be undertaken prior to development taking place (APAC, 2015b).

Sites 11, 13 - 19 – Stone walling/Iron Age settlement: These sites contain stone walling (livestock enclosures/kraals; stone platforms/granary stands & other features), large kraals/midden deposits and possible agricultural terracing. Some of these settlement sites are relatively extensive and are all probably related to a larger Iron Age Settlement Complex in the area. Site 16 is two features that could possibly be isivivanes – cairns of stones placed in areas by visitors to important settlements. Pottery, bone fragments (faunal remains) as well as upper and lower grinding

stones are found commonly all over these sites. It is possible that many more similar sites are located in the study area, but due to dense vegetation might have been missed during the assessment. It is recommended that should the proposed prospecting operations impact negatively on these sites that detailed archaeological mitigation be undertaken on them. This will include mapping and drawing, excavations and sampling of material. If possible the sites should be avoided and protected by proper fencing-in, sign-posting and Management through an implemented Heritage Management Plan (APAC, 2015b).

Site 12 – Possible Grave: This is another stone cairn, similar to those ones at Sites 2 & 3 that could be a possible grave. It is however difficult to determine this without a doubt, and although possibly a grave it is also likely that this feature could be associated with the stone walled sites found in the study area and could represent a stone platform such as a granary stand (APAC, 2015b).

Site 20 – Terracing and recent homestead remains: This site contains some well-built terrace walling and the foundations of a number of rondavels/huts on the terrace walls. It is similar to an existing and occupied homestead close by. One of the residents indicated that according to him the site dates to the late 1950's. It is recommended that the site be recorded and mapped in detail should it be impacted by the prospecting activities, and that the history of the site be researched (APAC, 2015b).

Site 21 – Recent farming remains: This site is located next to the main dirt road through the mining area and overlooks the river valley (Thukela) below. It contains some stone walled remains of a possible homestead, a wire-fenced livestock enclosure, cement feature (possible water reservoir/dam) and possible stone-packed graves. The age of the site is unknown, but most likely date to the 1950's/1960's or even later (APAC, 2015b).

Site 22 – Iron Age Metal Working/Smelting Site: This is arguable the most important site found during the assessment, and is fairly extensive. It might also not be the only one of this nature in the area, as will be shown later on. It is located fairly close to the Thukela River and in an area heavily eroded. Similar areas (erosion dongas) exist here. The site is situated within the proposed prospecting area, and some impact by road works associated with mining prospecting/drilling in the area at that

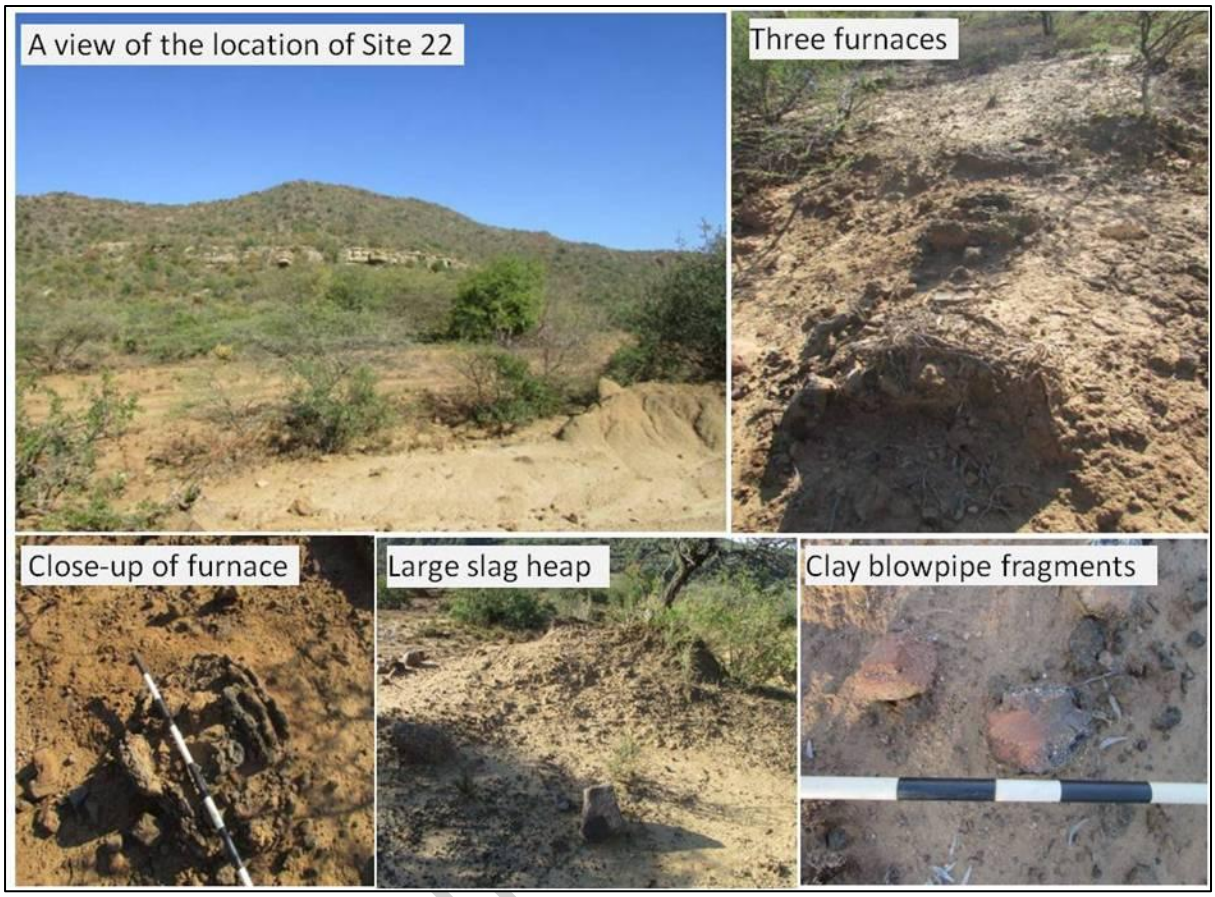
time (2015) was visible already. The site contains at least 13 metal smelting/forging furnaces, found in 6 different locations spread across the area, while large numbers of anvils, hammer stones (in some areas concentrations of these close to the smelting furnaces) and smaller stone tools associated with metal working were also found. Slag heaps area also located on the site, with anvils and hammer stones also located in close proximity to these heaps. At least one hut floor was also recorded, as well scatters of pottery, metal artifacts, glass beads and animal bones. The site seems to have been an extensive metal working complex, with the possibility of more sites such as these existing in the area. Sites such as these are scarce, especially in terms of its size, while the fairly good preservation of the metal/iron smelting ovens on the site enhances the Archaeological Significance of the site even further (APAC, 2015b).

Only a few of these sites have been archaeologically researched in much detail in the past. One such site is the one at Mabhija, excavated by Tim Maggs in the 1980's. The site is located around 20km down the Thukela River from Colenso. He found evidence of mining for iron ore, as well as numerous smelting sites marked by scatters of slag, furnace fragments and other cultural material. He excavated some of these furnaces and commented that this area would not have been suitable for herding of cattle and crop growing and would not have supported a dense population. He advocates that these sites would have functioned as a trading center from where iron goods were bartered for with sheep and sorghum. Mabhija dates to the second millennium AD, and therefore from AD1000 onwards (Hall, 1987).

According to APAC (2015b) the site in the proposed prospecting area, and indeed the possible others not recorded as yet, will play a major part in our understanding of not only metal working at the time, but also the way of life of the people who utilized and occupied these sites and the region. APAC (2015b) recommends that the site be preserved and researched in detail at all costs, and the impact from proposed developments at or close to the site should be minimized and negated through fencing-in, the halting of the destructive erosion now exposing these sites, detailed archaeological research and long-term management through an implemented Cultural Heritage Resources Management Plan. It is recommended that any developer of the area, in conjunction with specialists, Amafa Kwazulu-Natali and other related Departments, should take hands in this matter and ensure that this and

other possible sites situated in the proposed area close to the Thukela River are properly researched and preserved for future generations(APAC, 2015b).

Figure 45: Photos of Site 22



Source: APAC Phase 1 HIA (2015a)

(b) Description of the current land uses.

8.15 LAND USE

The land use in the area is characterised by natural or undeveloped areas which have been partially transformed and degraded as a result of urban transformation, rural settlement and agricultural activities in the form of livestock grazing, subsistence and commercial farming.

Emaweni Game Ranch and Hunting Lodge, operated by Thukela Wildlife CC, is located on the remaining extent of the farm Klip Berg 2158.

The remainder of the proposed prospecting site is used by the communities for subsistence farming, wood gathering and cattle grazing.

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

8.15.1 Environmental features

The topography in the proposed application area displays a variation of form and is characterised by a mix of relatively flat plains, hilly terrain and incised valleys.

One borehole (EBH07) located on Emaweni Game Farm (approximately 1.2 km from the boundary of the farm Schurfde Poort 1147) is in use as a production borehole for human consumption. Groundwater levels in the area vary between 1.0 to 78.6 mbgl. The average groundwater level is approximately 23.2 mbgl. Groundwater levels follow topography and it can be assumed that groundwater flow takes place under unconfined to semi-confined conditions (AGES, 2015). Groundwater in the direct vicinity of the proposed prospecting area is of marginal to poor quality for drinking water purposes. Borehole yields range 7 from 0.5 – 2.0 l/s (21).

The perennial Thukela River forms the northern and eastern border of the proposed prospecting area. The Thukela River has a Freshwater Ecosystem Priority Area (FEPA) status and a Class B PES is assigned by the DWS. There are also a myriad of ephemeral drainage lines bisecting the area, which only contains water for short periods after rains. Several farm dams are situated in the general area of the proposed application area. A large portion of the proposed prospecting site consists of natural areas (See Figure 46).

Several wetlands can be found on the application area. These wetlands correlate with the farm dams that can be found on the area and along the Thukela River.

The soils are shallow, red and brown sandy loams to sandy clay loams with only small areas of deeper soils and occasional surface rocks.

The proposed prospecting area is located in a transitional zone between the grassland and savannah biomes. The proposed prospecting area is found within the Thukela Thornveld and the Thukela Valley Bushveld vegetation units (Mucina and Rutherford, 2006). The woodland in the proposed prospecting area ranges from open woodland with a prominent grass layer and scattered thorn trees to very dense, almost impenetrable areas of thick scrub. Large trees are generally scarce. The woodland becomes progressively denser from the west to the east. The densest

woodland is found in the Thukela River valley. In places the woodland has been impacted by wood collection, with some areas almost cleared of trees. The grass layer has been visibly impacted by grazing, and in some areas bush densification is evident (Van Rooyen and Froneman, 2014).

One species of conservation concern, *Hypoxis hemerocallidea* (Star-flower), listed as 'Declining', was present at the Schurfde Poort 1147 Portion 1. Between 10-20 individuals of a single species within the genus *Ledebouria*, within the family Hyacinthaceae (of which all members are protected under provincial legislation of KwaZulu Natal), were also present at the site.

Red Data birds of four different species were recorded at 15 different localities in the direct project area and immediately adjacent areas. These four Red Data bird species were: White-bellied Korhaan, Lanner Falcon, Southern Bald Ibis and Black Stork. All four are regarded as regionally ‘Vulnerable’ (see shaded records in Table 14). Of these four species, the endemic Southern Bald Ibis is also considered as globally threatened (global category also ‘Vulnerable’) (Allan, 2015).

According to the UThukela Biodiversity Sector Plan (2015) there is one area at the west side of the application area on Portion 1 of the farm Gannahoek 1317 that is classified as a CBA Irreplaceable. There are several small areas scattered within the boundary of the proposed prospecting site that are classified as CBA Optimal. Please refer Figure 35.

Several heritage sites have been found on the proposed prospecting area. The sites include farmsteads and remains of farmsteads, graves, Stone Age tool scatters, stone walling/Iron Age Settlements and an Iron Age Metal Working/Smelting site. The Iron Age Metal Working/Smelting site is arguable the most important site found on the proposed prospecting area thus far, and is fairly extensive.

Emaweni Game Ranch and Hunting Lodge, operated by Thukela Wildlife CC, is located on the remaining extent of the farm Klip Berg 2158. The remainder of the proposed prospecting site is used by the communities for subsistence farming, wood gathering and cattle grazing.

8.15.2 Infrastructure

Infrastructure on the prospecting application area is limited to the District Road D488 that transects Schurfde Poort 1147 and leads to Brak Fontein 18033 and Ganna Hoek 1317, several farm/dirt roads and farm dams.

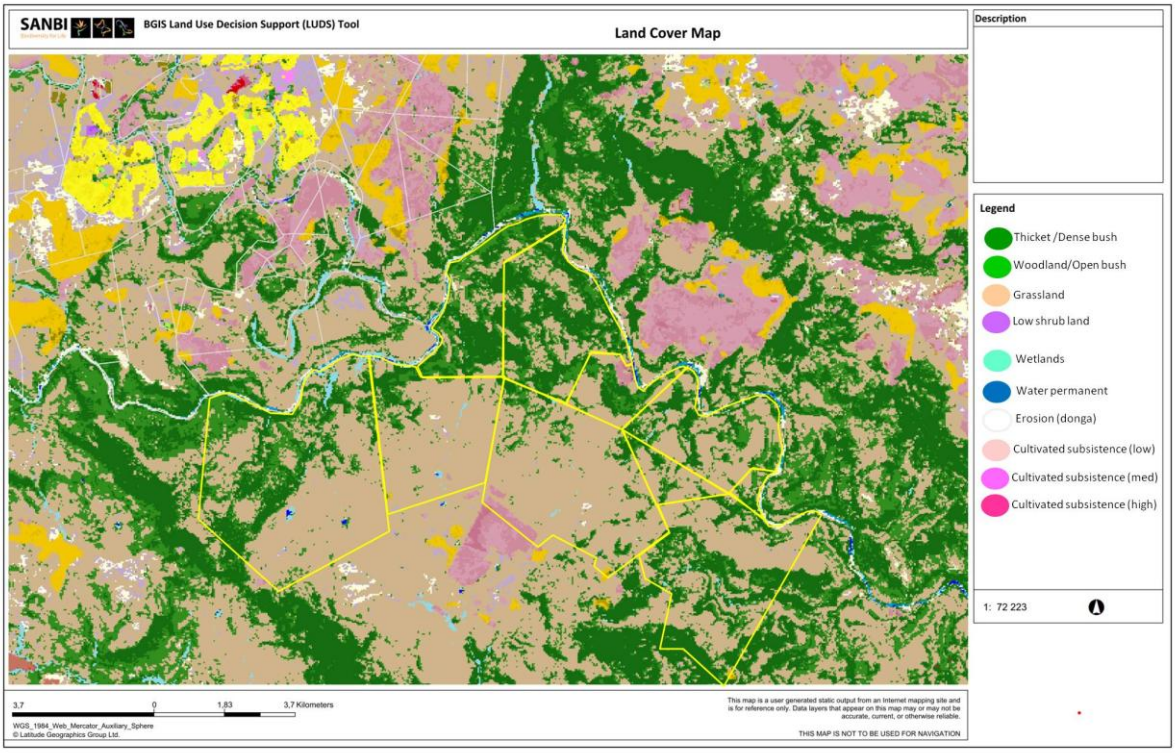
(d) Environmental and current land use map. (Show all environmental, and current land use features)

The land use in the area is characterized by natural or undeveloped areas which have been partially transformed and degraded as a result of urban transformation, rural settlement, and agricultural activities in the form of livestock grazing, subsistence and commercial farming. Although some informal residential, homesteads and related structures, as well as agricultural activities, have impacted on the area in the historical and recent past, the land parcels are fairly undeveloped.

Emaweni Game Ranch and Hunting Lodge, operated by Thukela Wildlife CC, are located on the remaining extent of the farm Klip Berg 2158.

The remainder of the proposed prospecting site is used by the communities for subsistence farming, wood gathering and cattle grazing.

Figure 46: National Land Cover Map



Source: SANBI BGIS, National Landcover, 2014

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

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

9 IMPACT ASSESSMENT

The impact Assessment is presented in the table below.

Table 18: Impact Assessment Table

ACTIVITIES	POTENTIAL IMPACT	Extent of impact	Duration of impact	Intensity of impact	Probability of occurrence of impact	SIGNIFICANCE if not mitigated
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Removal of / damage to natural vegetation	2	2	1	4	16
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil	1	3	3	2	18
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Changes to the shape or form of the land	1	1	1	2	2
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Impact on current land use	1	1	3	2	6
Vegetation clearance, Site establishment, Drilling activities, digging of trial pits & movement of people and equipment on site	Destruction of cultural heritage sites and artefacts	4	5	3	2	120
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to sensitive biodiversity areas CBA Irreplaceable)	3	4	3	3	108
Vegetation clearance for	Damage to sensitive	3	4	3	3	108

ACTIVITIES	POTENTIAL IMPACT	Extent of impact	Duration of impact	Intensity of impact	Probability of occurrence of impact	SIGNIFICANCE if not mitigated
establishment of trial pits & cutting of vegetation at drill sites	biodiversity areas (CBA Optimal)					
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to wetland / riparian vegetation	2	2	3	2	24
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Air Quality Impact (Dust)	1	1	2	4	8
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Disturbance of commercial & community activities on site	1	1	1	2	2
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Storm water run-off from cleared areas could lead to siltation of water courses, farm dams and wetlands	1	2	3	3	18
Workers & material on site	Contamination of soils through spills from sanitation facilities & litter	1	1	2	3	6
Workers & material on site	Poaching / Killing of snakes & animals	1	3	3	3	27
Workers & material on site	Fire	2	2	2	3	24
Workers & material on site	Collection of fire wood, damage to property	2	2	3	2	24
Workers & material on site	Contribution to the economy through employment	2	1	3	4	24 POSITIVE
Workers & material on site	Snake bites	1	1	3	3	9
Workers & material on site	Spread of HIV/Aids to local community	2	4	3	2	48
Use of heavy machinery & vehicles on site for drilling or trial pit activities	Resource consumption (diesel - non-renewable resource)	2	3	2	2	24
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of soils through hydrocarbon leaks and spills from machinery & equipment	1	2	3	3	18
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Use of groundwater for drilling or trial pits activities	2	1	3	1	6
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of groundwater through hydrocarbon leaks and spills from machinery &	2	3	3	1	18

ACTIVITIES	POTENTIAL IMPACT	Extent of impact	Duration of impact	Intensity of impact	Probability of occurrence of impact	SIGNIFICANCE if not mitigated
	equipment					
Use of heavy machinery & vehicles on site for drilling	Contamination of water courses, wetlands and farm dams through hydrocarbon leaks and spills from machinery & equipment	2	3	3	2	36
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Compaction of soils through movement of heavy vehicles and machinery on site	1	1	2	4	8
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to vegetation	1	2	3	4	24
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to CBA Irreplaceable & Optimal Areas	3	3	3	3	81
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to riparian and wetland vegetation	1	3	3	3	27
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Release of gaseous emissions	2	2	3	3	36
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Air Quality Impact (Dust)	2	1	3	4	24
Use of heavy machinery & vehicles on site for drilling or digging trial pit activities	Increase in ambient noise levels	1	1	2	4	8
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Visual intrusion	1	1	2	4	8
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Disturbance of fauna species in the vicinity	2	2	3	4	48
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Proliferation of invasive plant species	1	3	3	4	36
Closure						
Concurrent rehabilitation	Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion	1	4	1	4	16
Concurrent rehabilitation	Use stockpiled top soil to close sumps and trial pits	1	5	3	4	60

ACTIVITIES	POTENTIAL IMPACT	Extent of impact	Duration of impact	Intensity of impact	Probability of occurrence of impact	SIGNIFICANCE if not mitigated
Close drill hole	Restoration of land use and land capability	1	3	2	3	18 POSITIVE

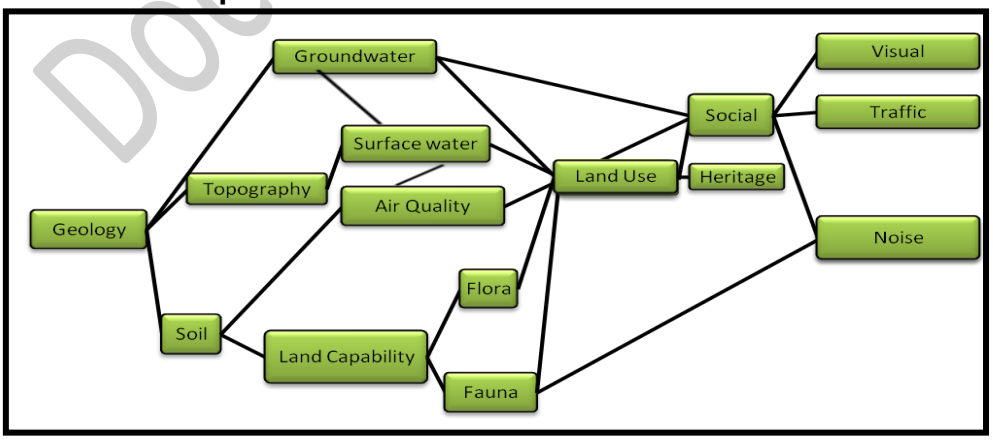
9.1 POTENTIAL CUMULATIVE IMPACTS

Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (Department of Environmental Affairs and Tourism, June 2006). Impacts may aggregate and interact in the following ways:

(a) Spatial Impacts - impacts occur over an area. Spatial impacts may vary in both extent and intensity.
(b) Temporal Impacts - impacts that vary over time.
(c) Linked Impacts – involves more complex interaction, such as where one impact triggers another.

The figure below gives a presentation of linked impacts depicting integrated and interrelated environmental factors

Figure 47: Integrated and Interrelated Environmental Factors that leads to cumulative impacts



Source: Diagram developed by JC Baartjes

Based on an assessment of the above types of cumulative impacts, potential cumulative impacts will be limited to the impact on the CBA Irreplaceable and Optimal Areas. The area proposed for the prospecting activity is for the most part undeveloped.

Table 19: Potential Cumulative Impacts

ACTIVITY	ASPECT	IMPACT
Vegetation clearance & Site establishment	Establishment of drilling site and access road	Damage to habitats or species of conservation importance in CBA Irreplaceable and Optimal areas. Potential biodiversity loss
Vegetation clearance & Site establishment	Establishment of drilling site and access road	Damage to sensitive biodiversity areas - CBA Irreplaceable and Optimal areas. Potential biodiversity loss
Workers & material on site	Accidental fires	Removal/ damage of vegetation of conservation concern
Drilling & Pitting Activities	Noise	Disturbance of faunal species of conservation concern in the locality

9.2 IMPACT ASSESSMENT METHODOLOGY

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;
(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

All activities associated with the different phases of the project (construction, operation and decommissioning) were listed and assessed to determine potential impacts.

In order to determine the significance of an activity each activity was rated. The following parameters were used:

9.2.1 Extent of impact (E)

1 = Site specific - Extending only as far as the activity, or limited to the site and its immediate surroundings

2 = Regional - Will have an impact on the region. A development can often have a regional impact on Biodiversity. Example: if a feeding site for birds or mammals is

destroyed, the population might leave the area or go extinct if they don't find other suitable areas.

3 = National - Will have an impact on a national scale - particularly if an ecosystem or species of national significance is affected

4 = International - Will have an impact across international borders or will impact on an ecosystem or species of international significance

9.2.2 Duration of impact (D)

1 = Short term (0-5 years)

2 = Medium term (5-15 years)

3 = Long term (16-30 years) - Impact will cease after the operational or working life of the activity, either due to natural process or by human intervention

4 = Discontinuous or intermittent - Impact may only occur during specific climatic conditions or during a particular time of year

5 = Permanent - Impact will be where mitigation or moderation by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient or temporary

9.2.3 Intensity of impact (I)

1 = Low Impact - Affects the environment in such a way that natural, cultural and soil functions and processes are not affected

2 = Medium Impact - Affected environment is altered by natural, cultural and soil functions and processes continue although in a modified way

3 = High Impact - Natural, cultural or social functions or processes are altered to the extent that they will temporarily or permanently cease

9.2.4 Probability of impact occurring (P)

1 = Improbable – Low likelihood

2 = Probable – Distinct possibility

3 = Highly probable – Most likely

4 = Definite - Impact will occur regardless of any prevention measures

Criteria of assigning significance to potential impacts

Significance is determined by means of the following calculation:

Extent of Impact **X** Duration of Impact **X** Intensity of Impact **X** Probability of Occurrence of Impact **= SIGNIFICANCE**

9.2.5 Significance determination criteria

Extent of Impact		Duration of Impact	
Site Specific	1	Short term	1
Regional	2	Medium term	2
National	3	Discontinuous	3
International	4	Long term	4
		Permanent	5

Intensity of Impact		Probability of Occurrence of Impact	
Low	1	Improbably (low likelihood)	1
Medium	2	Probable (Distinct possibility)	2
High	3	Highly probable (Most likely)	3
		Definite	4

SIGNIFICANCE

High	73 - 240
Medium	36 - 72
Low	1- 35

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.
(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Positive impacts associated with the proposed prospecting:

(a) Employment contributing to the economy

(b) Contribution to knowledge base in terms of Heritage Resources

(c) The economic values of the mineral resource is determined

Negative impacts associated with the proposed prospecting:

(a) Removal / damage of natural vegetation

(b) Damage to sensitive biodiversity areas - CBA Irreplaceable & Optimal Areas

(c) Loss of soil resources

(d) Damage to ephemeral watercourses & wetlands

(e) Increase in erosion due to vegetation clearance & compaction

(f) Use of vehicles on site – compaction

(g) Change of current land use

(h) Destruction of cultural heritage sites and artefacts

(i) Contamination of soils

(j) Litter

9.3 MITIGATION MEASURES

	viii) The possible mitigation measures that could be applied and the level of risk. (With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Mitigation measures were identified for all possible impacts including the impacts of medium and low significance to ascertain to what degree these impacts can be reversed.

Table 20: Impact and Mitigation Table

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Removal of / damage to natural vegetation	1) Boreholes, trial pits and access tracks will be located in areas that will result in the least ground disturbance. 2) Permission will be obtained from landowners before trees are felled, pick and transport permits will be obtained in the event that it is a conservation important species. 3) Where an access road is needed, the relevant occupant and owner will be consulted prior to the development of that access road to ensure that consensus is reached on the manner and the placement and how it will be rehabilitated at the end of the drilling programme. 4) Vegetation clearance will be limited to 0.01 ha per drill hole, by ensuring that only vegetation

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
		that is required to be cleared, is cleared.
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil	1) Topsoil will be stripped to a depth of 250 mm from trial pits and stored outside the 1:50 year flood levels of watercourses, within the firebreak area. 2) Topsoil will be adequately protected from being blown away or being eroded. 3) Boreholes and access tracks will be located in areas that will result in minimal ground disturbance.
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Changes to the shape or form of the land	1) During the planning phase for each borehole or trial pit, specific controls will be identified and implemented, based on site conditions. 2) Only 10 drill holes and two trial pits will be made 3) Areas will be rehabilitated concurrently
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Impact on current land use	1) Land disturbed will be rehabilitated to a stable and permanent form, suitable for subsequent land use. 2) Exact location of drill holes, trial pits and new access routes will be determined through communication with the land owner.
Vegetation clearance, Site establishment , Drilling activities, digging of trial pits & movement of people and equipment on site	Destruction of cultural heritage sites and artefacts	1) Stone walling / Iron Age settlement sites should be avoided and fenced-off for management protection. If impacted detailed archaeological mitigation should be undertaken. To be included in Cultural Resources Management Plan. 2) Stone Age tool scatters (Open-air sites) if impacted - Sampling of material for representative collection before destruction 3) Possible s should be fenced-off to manage/protect the sites. If required then the graves could be exhumed and relocated after the necessary permissions have been provided and detailed social consultation has been undertaken. 4) Terracing and recent homestead remains site should be recorded and mapped in detail should it be impacted on. The history of the site be should be researched. Otherwise avoid. 5) Iron Age Metal Working/Smelting Site - No prospecting activities allowed within 50 m to halt destructive erosion now exposing the sites. The site should be preserved and researched in detail. The site should be fenced-in, details archaeological research and Long-term Management through an Implemented Cultural Heritage Resources Management Plan. Liaison with specialists, Amafa Kwazulu-Natal and other related Departments. 6) Other potential heritage sites will be identified

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
		during the planning phase to ensure that such areas are avoided. Each prospecting site will be visited prior to any work starting to identify possible heritage sites. 7) Prospecting activities will be kept away from excluded and exempted areas. 9) Where boreholes are sited in proximity to any heritage sites and depending on the proximity to the drilling or trial pit site, appropriate measures such as flagging, pegging or installation of temporary fencing will be undertaken to ensure that the site is not impacted on during prospecting.
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to sensitive biodiversity areas CBA Irreplaceable)	1) No drilling or trial pit activities will take place in the KZN irreplaceable areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared. 3) Buffer 30 m
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to sensitive biodiversity areas (CBA Optimal)	1) No drilling or trial pit activities will take place in the KZN Optimal areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared. 3) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken with the appropriate environmental authorization - Listing 3 Activity included in this application. 4) buffer 30 m.
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to wetland / riparian vegetation	1) No prospecting activity within 100 m of watercourses or 50m to wetlands without authorisation from DWS 2)Controls will be aimed at reducing erosion and sediment washing from drill pads, access roads and other disturbed areas. 3) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into water courses, farm dams and wetlands. 4) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching.
Vegetation clearance for establishment of trial pits & cutting of	Air Quality Impact (Dust)	1) Dust will be effectively controlled in all areas cleared from vegetation through water spraying or other soil stabilization techniques. 2) The impact on air quality can be reduced by

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
vegetation at drill sites		considering alternative soil stabilisation techniques, like but not limited to, re-vegetating areas. 3) Other alternatives for stabilisation include the covering of areas with mulch or alternatively use organic material to cover areas where the vegetation has been cleared.
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Disturbance of commercial & community activities on site	1) Prospecting activities will be discussed with landowners / occupiers prior to work commencing. 2) Drill holes, trial pits and access routes not wanted by land owners on completion of prospecting activities will be rehabilitated
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Storm water run-off from cleared areas could lead to siltation of water courses, farm dams and wetlands	1) Controls will be aimed at reducing erosion and sediment washing from drill pads, access roads and other disturbed areas. 2) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into watercourses, farm dams and wetlands. 3) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching.
Workers & material on site	Contamination of soils through spills from sanitation facilities & litter	1) A chemical toilet will be used on site during prospecting and will be used in such a way as to prevent water pollution. The use of a chemical toilet will be undertaken in consultation with the landowner. 2) Full or leaking toilets must be reported to the Supervisor for corrective action or replacement. 3) Prospecting areas will be maintained in a clean and tidy condition at all times. 4) All waste will be collected, separated and stored in properly constructed containers with lids and removed to an approved landfill or another site according to local municipal requirements. 5) Full waste bins must be reported to the Supervisor for collection and disposal at an approved landfill.
Workers & material on site	Poaching / Killing of snakes & animals	1) Employees will stay in town or in existing dwellings on site. 2) Hunting / poaching will not be allowed. 3) Maximum of three drill site will be active at any given time. 4) All employees will be present at the drill sites with appropriate supervision.
Workers & material on site	Fire	1) Vegetation around each exploration site within a 5m radius will be kept short to create a fire management zone. 2) Collection of firewood will not be allowed. 3) Open fires will be prohibited to people

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
		involved in prospecting. 4) No burning cigarettes or matches may be thrown down within the prospecting area. A bucket with sand will be provided for the disposal of cigarettes and matches. 5) No smoking will be allowed near gas, paints or fuel storage areas. 6) Suitable welding blankets are to be used when welding or operating grinders and this equipment is to be serviced regularly. 7) Rubbish or vegetation may under no circumstances be burnt. All waste will be removed off site and disposed of at an approved landfill.
Workers & material on site	Collection of fire wood, damage to property	1) Collection of firewood will not be allowed. 2) Maximum of three drill sites will be active at any given time. 3) All employees will be present at the drill sites with appropriate supervision 4) Complaints and outcomes of subsequent investigations will be recorded in a Complaints Register that will be available for inspection. 5) If damage to private property occurs as a result of prospecting activities, such damage will be repaired or owners will be compensated as appropriate.
Workers & material on site	Contribution to the economy through employment	1) Due to the nature of prospecting, employment opportunities will be minimal. The prospecting crew is small (10 - 12 people) with specialised skills. Were possible, local people will however be employed during the project. 2) Local people and businesses with appropriate skills will be identified and included in the project tender process. The applicant is committed to employ local people and make use of local businesses during the project, where possible.
Workers & material on site	Snake bites	1) Visual inspections for snakes will be conducted before any work will commence in a specific area. 2) Workers will be instructed to be aware of the possible presence of snakes at all times. 3) Workers will be trained on what emergency actions to take in case of a snake bite.
Workers & material on site	Spread of HIV/Aids to local community	1) Due to the nature of prospecting, a limited amount of employees (10 - 12 people) will come to site daily to work and then leave for their own accommodation at night. 2) Employees will stay in town or in existing dwellings on site. 3) Aids awareness talks will be conducted.
Use of heavy machinery &	Resource consumption	1) Vehicles and equipment to be serviced regularly and maintained in good working

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
vehicles on site for drilling or trial pit activities	(diesel - non-renewable resource)	condition
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of soils through hydrocarbon leaks and spills from machinery & equipment	1) All chemicals, fuels and oils to be stored on site will be appropriately bunded. 2) Precautions will be taken to prevent spills and soil contamination (e.g. use of drip trays) 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedures. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Use of groundwater for drilling or trial pits activities	1) Water will be sourced from a commercial supplier and delivered to site by water tanker. 2) Adequate provision will be made for storing drinking water on site in the form of 2500 litre water tanks.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment	1) Machinery and equipment will only be maintained over a drip tray, a thin concrete slab or a PVC lining to prevent soil and water contamination. 2) No vehicle will be extensively repaired on site. 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedures. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism.
Use of heavy machinery & vehicles on site for drilling	Contamination of water courses, wetlands and farm dams through hydrocarbon leaks and spills from machinery & equipment	1) The drilling fluid that will be used during prospecting must be biodegradable and not pose a water pollution threat. 2) Drilling sumps and containment measures will be designed to contain all drilling fluid. 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements top ensure correct clean-up procedure. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism. 5) No drill site or trial pit will be located within 100m from watercourses or within 500m from wetlands unless authorisation has been obtained from DWS.
Use of heavy	Compaction of soils	1) Stay on predefined areas and routes.

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
machinery & vehicles on site for drilling or digging trial pits	through movement of heavy vehicles and machinery on site	2) Scarify access roads and stockpile areas to a depth of 500 mm and restore topsoil cover. 3) Re-seed or plant vegetation indigenous to the area.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to vegetation	1) Vehicles will only stay on dedicated roads (turning circles). 2) No movement of heavy machinery outside dedicated routes. 3) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to CBA Irreplaceable & Optimal Areas	1) No prospecting activities will occur within CBA Irreplaceable areas & 30 m buffer. 2) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken with the appropriate environmental authorization - Listing 3 Activity included in this application. 3) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared. 4) No movement of heavy machinery outside dedicated routes. 5) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to riparian and wetland vegetation	1) No prospecting activities will be allowed closer than 100 m from water courses & farm dams or within 500 m from wetlands without authorisation from DWS 2) Vehicles will only stay on dedicated roads (turning circles). 3) No movement of heavy machinery outside dedicated routes. 4) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Release of gaseous emissions	1) Vehicles and equipment will be maintained in a good working order.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Air Quality Impact (Dust)	1) Speed limits on gravel roads will be 40 km/hr to reduce dust and noise generation. 2) Dust will be effectively controlled in all disturbed areas through water spraying or other soil stabilization techniques.

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
		3) The type and compaction of road building material, can reduce the amount of dust generated.
Use of heavy machinery & vehicles on site for drilling or digging trial pit activities	Increase in ambient noise levels	1) Speed limits on gravel roads will be 40 km/hr to reduce dust and noise generation. 2) Prospecting activities will be restricted to day light hours.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Visual intrusion	1) A maximum of three drill sites to be drilled at any one time 2) Concurrent rehabilitation
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Disturbance of fauna species in the vicinity	1) Prospecting activities will be kept away from CBA Irreplaceable and other excluded and exempted areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit activity site to confirm that no threatened species, ecologically sensitive areas or conservation important areas are present in sections to be cleared. 3) Areas of ecological significance (CBA Optimal) will be avoided and if disturbance cannot be avoided, it will be undertaken in accordance with legislation - Listing Notice 3 Activity included in this application, 30 m buffer to be managed 4) No bird nests will be disturbed 5) Maximum of three sites to be drilled at any time. 6) Concurrent rehabilitation.
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Proliferation of invasive plant species	1) Machinery will be cleared of dust/mud and seed prior to relocation to the next site to prevent the spread of alien invasive species.
Closure		
Concurrent rehabilitation	Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion	1) Remaining refuse, chemicals, fuels and waste materials will be removed from the site following the completion of the prospecting programme. Such waste will be disposed of to an approved landfill. 2) Erosion and sediment controls as well as the disturbed area will be rehabilitated. 3) An inspection on whether there is evidence of weeds or pest invasion as a result of prospecting activities will be undertaken and appropriate remediation actions will be implemented as required.
Concurrent rehabilitation	Use stockpiled top soil to close sumps	1) Scarify access roads and stockpile storage areas to a depth of 500 mm.

ACTIVITIES	POTENTIAL IMPACT	MITIGATION MEASURES
	and trial pits	2) Restore topsoil cover. 3) Re-seed or plant vegetation indigenous to the area.
Close drill hole	Restoration of land use and land capability	1) Exploration boreholes are to be capped when no drilling work is being undertaken. 2) Exploration boreholes which will not be used during production to be sealed with cement once exploration work has been completed.

ix) Motivation where no alternative sites were considered.

Location Alternatives: There are no sites which have a similar location advantage. The applicant has noted that an extension of 2-3 km to the south could also have been included to encompass a larger area but remains certain the current location is preferable.

x) Statement motivating the alternative development location within the overall site.
(Provide a statement motivating the final site layout that is proposed)

No prospecting activities will occur in the Irreplaceable Critical Biodiversity Area. Drill holes and trial pits will not be located closer than a 100m to a watercourse or within 500m from a wetland without authorisation from the Department of Water and Sanitation. Holes and trial pits will not be located within 50m from identified heritage resources and a buffer of a 100m will be kept from provincial roads and all houses / dwellings that occur on the proposed prospecting area. Only approximately 0.17 ha of the total 6,333.2240 ha will be disturbed. A buffer of 30m will be kept from CBA areas.

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

Please refer to Tables 19 and 20

j) Assessment of each identified potentially significant impact and risk

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

Table 8: Assessment of potentially significant impacts

The significance of the impacts after the implementation of mitigation measures were determined to ascertain if impacts with high significance could still cause irreplaceable loss of resources even with the implementation of the mitigation measures identified. This aided in the identification of any residual risk i.e. impacts with high significance even after the implementation of mitigation measures.

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	*In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure)*	*(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)*		*if not mitigated*	*(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation..*	*if mitigated*

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Removal of / damage to natural vegetation	Vegetation	16	1) Boreholes, trial pits and access tracks will be located in areas that will result in the least ground disturbance. 2) Permission will be obtained from landowners before trees are felled, pick and transport permits will be obtained in the event that it is a conservation important species. 3) Where an access road is needed, the relevant occupant and owner will be consulted prior to the development of that access road to ensure that consensus is reached on the manner and the placement and how it will be rehabilitated at the end of the drilling programme. 4) Vegetation clearance will be limited to 0.01 ha per drill hole	Low
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil	Soils	18	1) Topsoil will be stripped to a depth of 250 mm from all disturbed areas and stored outside the 1:50 year flood levels of watercourses, within the firebreak area. 2) Topsoil will be adequately protected from being blown away or being eroded. 3) Boreholes and access tracks will be located in areas that will result in minimal ground disturbance.	Low
Vegetation clearance for establishment of trial pits &	Operational	Changes to the shape or form of the land	Topography	2	1) During the planning phase for each borehole or trial pit, specific controls	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
cutting of vegetation at drill sites					will be identified and implemented, based on site conditions. 2) Only 10 drill holes and two trial pits will be made 3) Areas will be rehabilitated concurrently	
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Impact on current land use	Land Use & Land Capability	6	1) Land disturbed will be rehabilitated to a stable and permanent form, suitable for subsequent land use. 2) Exact location of drill holes, trial pits and new access routes will be determined through communication with the land owner	Low
Vegetation clearance, Site establishment , Drilling activities, digging of trial pits & movement of people and equipment on site	Operational	Destruction of cultural heritage sites and artefacts	Cultural Heritage	120	1) Stone walling / Iron Age settlement sites should be avoided and fenced-off for management protection. If impacted detailed archaeological mitigation should be undertaken. To be included in Cultural Resources Management Plan. 2) Stone Age tool scatters (Open-air sites) if impacted - Sampling of material for representative collection before destruction 3) Possible s should be fenced-off to manage/protect the sites. If required then the graves could be exhumed and relocated after the necessary permissions have been provided and detailed social consultation has been undertaken.	Medium

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					4) Terracing and recent homestead remains site should be recorded and mapped in detail should it be impacted on. The history of the site be should be researched. Otherwise avoid. 5) Iron Age Metal Working/Smelting Site - No prospecting activities allowed within 50 m to halt destructive erosion now exposing the sites. The site should be preserved and researched in detail. The site should be fenced-in, details archaeological research and Long-term Management through an Implemented Cultural Heritage Resources Management Plan. Liaison with specialists, Amafa Kwazulu-Natal and other related Departments. 6) Other potential heritage sites will be identified during the planning phase to ensure that such areas are avoided. Each prospecting site will be visited prior to any work starting to identify possible heritage sites. 7) Prospecting activities will be kept away from excluded and exempted areas. 9) Where boreholes are sited in proximity to any heritage sites and	

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					depending on the proximity to the drilling or trial pit site, appropriate measures such as flagging, pegging or installation of temporary fencing will be undertaken to ensure that the site is not impacted on during prospecting.	
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Damage to sensitive biodiversity areas CBA Irreplaceable)	Biodiversity (KZN Irreplaceable Areas)	108	1) No drilling or trial pit activities will take place in the KZN irreplaceable areas or in a 30 m buffer around these areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared.	Medium
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Damage to sensitive biodiversity areas (CBA Optimal)	Biodiversity (KZN Optimal Areas)	108	1) No drilling or trial pit activities will take place in the KZN Optimal areas and in a 30 m buffer around these areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared. 3) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken with the appropriate environmental	Medium

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					authorization - Listing 3 Activity included in this application.	
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Damage to wetland / riparian vegetation	Wetland / Riverine Vegetation	24	1) No prospecting activity within 100 m of watercourses or 50m to wetlands without authorisation from DWS 2)Controls will be aimed at reducing erosion and sediment washing from drill pads, access roads and other disturbed areas. 3) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into water courses, farm dams and wetlands. 4) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching.	Low
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Air Quality Impact (Dust)	Air Quality	8	1) Dust will be effectively controlled in all areas cleared from vegetation through water spraying or other soil stabilization techniques. 2) The impact on air quality can be reduced by considering alternative soil stabilisation techniques, like but not limited to, re-vegetating areas. 3) Other alternatives for stabilisation include the covering of areas with mulch or alternatively use organic material to cover areas where the vegetation has been cleared.	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Disturbance of commercial & community activities on site	Social and Economic Environment	2	1) Prospecting activities will be discussed with landowners / occupiers prior to work commencing. 2) Drill holes, trial pits and access routes not wanted by land owners on completion of prospecting activities will be rehabilitated	Low
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Storm water run-off from cleared areas could lead to siltation of water courses, farm dams and wetlands	Surface Water	18	1) Controls will be aimed at reducing erosion and sediment washing from drill pads, access roads and other disturbed areas. 2) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into watercourses, farm dams and wetlands. 3) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching.	Low
Workers & material on site	Operational	Contamination of soils through spills from sanitation facilities & litter	Soils	6	1) A chemical toilet will be used on site during prospecting and will be used in such a way as to prevent water pollution. The use of a chemical toilet will be undertaken in consultation with the landowner. 2) Full or leaking toilets must be reported to the Supervisor for corrective action or replacement. 3) Prospecting areas will be maintained in a clean and tidy	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					condition at all times. 4) All waste will be collected, separated and stored in properly constructed containers with lids and removed to an approved landfill or another site according to local municipal requirements. 5) Full waste bins must be reported to the Supervisor for collection and disposal at an approved landfill.	
Workers & material on site	Operational	Poaching / Killing of snakes & animals	Fauna	27	1) Employees will stay in town or in existing dwellings on site. 2) Hunting / poaching will not be allowed. 3) Maximum of three drill site will be active at any given time. 4) All employees will be present at the drill sites with appropriate supervision.	Low
Workers & material on site	Operational	Fire	Social and Economic & Ecology Environment	24	1) Vegetation around each exploration site within a 5m radius will be kept short to create a fire management zone. 2) Collection of firewood will not be allowed. 3) Open fires will be prohibited to people involved in prospecting. 4) No burning cigarettes or matches may be thrown down within the prospecting area. A bucket with sand will be provided for the disposal of	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					cigarettes and matches. 5) No smoking will be allowed near gas, paints or fuel storage areas. 6) Suitable welding blankets are to be used when welding or operating grinders and this equipment is to be serviced regularly. 7) Rubbish or vegetation may under no circumstances be burnt. All waste will be removed off site and disposed of at an approved landfill.	
Workers & material on site	Operational	Collection of fire wood, damage to property	Vegetation	24	1) Collection of firewood will not be allowed. 2) Maximum of three drill sites will be active at any given time. 3) All employees will be present at the drill sites with appropriate supervision 4) Complaints and outcomes of subsequent investigations will be recorded in a Complaints Register that will be available for inspection. 5) If damage to private property occurs as a result of prospecting activities, such damage will be repaired or owners will be compensated as appropriate.	Low
Workers & material on site	Operational	Contribution to the economy through employment	Social and Economic Environment	24	1) Due to the nature of prospecting, employment opportunities will be minimal. The prospecting crew is small (10 - 12 people) with specialised skills. Were possible,	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					local people will however be employed during the project. 2) Local people and businesses with appropriate skills will be identified and included in the project tender process. The applicant is committed to employ local people and make use of local businesses during the project, where possible.	
Workers & material on site	Operational	Snake bites	Safety	9	1) Visual inspections for snakes will be conducted before any work will commence in a specific area. 2) Workers will be instructed to be aware of the possible presence of snakes at all times. 3) Workers will be trained on what emergency actions to take in case of a snake bite.	Low
Workers & material on site	Operational	Spread of HIV/Aids to local community	Social and Economic Environment	48	1) Due to the nature of prospecting, a limited amount of employees (10 - 12 people) will come to site daily to work and then leave for their own accommodation at night. 2) Employees will stay in town or in existing dwellings on site. 3) Aids awareness talks will be conducted.	Low
Use of heavy machinery & vehicles on site for drilling or trial pit activities	Operational	Resource consumption (diesel - non-renewable resource)	Fossil fuels	24	1) Vehicles and equipment to be serviced regularly and maintained in good working condition	Low
Use of heavy machinery &	Operational	Contamination of soils	Soils	18	1) All chemicals, fuels and oils to be	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
vehicles on site for drilling or digging trial pits		through hydrocarbon leaks and spills from machinery & equipment			stored on site will be appropriately bunded. 2) Precautions will be taken to prevent spills and soil contamination (e.g. use of drip trays) 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedures. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism.	
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Use of groundwater for drilling or trial pits activities	Groundwater	6	1) Water will be sourced from a commercial supplier and delivered to site by water tanker. 2)Adequate provision will be made for storing drinking water on site in the form of 2500 litre water tanks.	Low
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment	Groundwater	18	1) Machinery and equipment will only be maintained over a drip tray, a thin concrete slab or a PVC lining to prevent soil and water contamination. 2) No vehicle will be extensively repaired on site. 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					up procedures. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism.	
Use of heavy machinery & vehicles on site for drilling	Operational	Contamination of water courses, wetlands and farm dams through hydrocarbon leaks and spills from machinery & equipment	Surface Water	36	1) The drilling fluid that will be used during prospecting must be biodegradable and not pose a water pollution threat. 2) Drilling sumps and containment measures will be designed to contain all drilling fluid. 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements top ensure correct clean-up procedure. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism. 5) No drill site or trial pit will be located within 100m from watercourses or within 500m from wetlands unless authorisation has been obtained from DWS.	Low
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Compaction of soils through movement of heavy vehicles and	Soils	8	1) Stay on predefined areas and routes. 2) Scarify access roads and stockpile	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
		machinery on site			areas to a depth of 500 mm and restore topsoil cover. 3) Re-seed or plant vegetation indigenous to the area.	
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Damage to vegetation	Vegetation	24	1) Vehicles will only stay on dedicated roads (turning circles). 2) No movement of heavy machinery outside dedicated routes. 3) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.	Low
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Damage to CBA Irreplaceable & Optimal Areas	Biodiversity	108	1) No prospecting activities will occur within CBA Irreplaceable areas and in a buffer of 30 m buffer around these areas. 2) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken with the appropriate environmental authorization - Listing 3 Activity included in this application. 3) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared. 4) No movement of heavy machinery outside dedicated routes.	Medium

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					5) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.	
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Damage to riparian and wetland vegetation	Vegetation	27	1) No prospecting activities will be allowed closer than 100 m from water courses & farm dams or within 500 m from wetlands without authorisation from DWS 2) Vehicles will only stay on dedicated roads (turning circles). 3) No movement of heavy machinery outside dedicated routes. 4) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.	Low
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Release of gaseous emissions	Air Quality	36	1) Vehicles and equipment will be maintained in a good working order.	Low
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Air Quality Impact (Dust)	Air Quality	24	1) Speed limits on gravel roads will be 40 km/hr to reduce dust and noise generation. 2) Dust will be effectively controlled in all disturbed areas through water spraying or other soil stabilization techniques. 3) The type and compaction of road building material, can reduce the	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					amount of dust generated.	
Use of heavy machinery & vehicles on site for drilling or digging trial pit activities	Operational	Increase in ambient noise levels	Social and Economic Environment	8	1) Speed limits on gravel roads will be 40 km/hr to reduce dust and noise generation. 2) Prospecting activities will be restricted to day light hours.	Low
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Visual intrusion	Social and Economic Environment	8	1) A maximum of three drill sites to be drilled at any one time 2) Concurrent rehabilitation	Low
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Disturbance of fauna species in the vicinity	Fauna	48	1) Prospecting activities will be kept away from CBA Irreplaceable and other excluded and exempted areas and in a buffer of 30 m buffer around these areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit activity site to confirm that no threatened species, ecologically sensitive areas or conservation important areas are present in sections to be cleared. 3) Areas of ecological significance (CBA Optimal) will be avoided and if disturbance cannot be avoided, it will be undertaken in accordance with legislation - Listing Notice 3 Activity included in this application. 4) No bird nests will be disturbed 5) Maximum of three sites to be drilled at any time.	Low

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					6) Concurrent rehabilitation.	
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Proliferation of invasive plant species	Vegetation	36	1) Machinery will be cleared of dust/mud and seed prior to relocation to the next site to prevent the spread of alien invasive species.	Low
Closure						
Concurrent rehabilitation	Closure	Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion	Land Use & Land Capability	16	1) Remaining refuse, chemicals, fuels and waste materials will be removed from the site following the completion of the prospecting programme. Such waste will be disposed of to an approved landfill. 2) Erosion and sediment controls as well as the disturbed area will be rehabilitated. 3) An inspection on whether there is evidence of weeds or pest invasion as a result of prospecting activities will be undertaken and appropriate remediation actions will be implemented as required.	Low
Concurrent rehabilitation	Closure	Use stockpiled top soil to close sumps and trial pits	Soils	60	1) Scarify access roads and stockpile storage areas to a depth of 500 mm. 2) Restore topsoil cover. 3) Re-seed or plant vegetation indigenous to the area.	Low
Close drill hole	Closure	Restoration of land use and land capability	Land Use & Land Capability	18	1) Exploration boreholes are to be capped when no drilling work is being undertaken. 2) Exploration boreholes which will not be used during production to be	Positive impact

NAME OF ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFI-CANCE if not mitigated	MITIGATION TYPE	SIGNIFI-CANCE if mitigated
					sealed with cement once exploration work has been completed.	

The supporting impact assessment conducted by the EAP is attached as an appendix, marked **Appendix 5.**

9.4 SPECIALIST STUDIES

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

Table 9: List of Specialist studies

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
No specialist studies required for the prospecting application	No specialist studies required for the prospecting application	No specialist studies required for the prospecting application	No specialist studies required for the prospecting application

Attach copies of Specialist Reports as appendices

Motivation on why no specialist studies were conducted:

As a qualified professional (See CV Attached) the EAP of this application has executed a desktop study and research to describe the environmental features of the project area.

The desktop vegetation investigation included the following:

(a) Classification of the main biome and description of the dominant vegetation type;

(b) Investigation of the dominant indigenous species within this region;

(c) Listing the endemic species;

(d) Listing the IUCN Red Data species; and

(e) The desktop invertebrate and mammal investigation, included the following:

(f) Endemic species;

(g) Baseline occurrences of species within the area;

(h) IUCN Red Data species

(i) Specialist reports for assessments conducted on or close to the proposed prospecting area

The following provincial and national legislation and best-practice documents are relevant to this study:

(a) KwaZulu-Natal Systematic Conservation Plan (KZNSCP) - 2010

(b) KwaZulu-Natal (KZN) Biodiversity Sector Plans 2014

(c) National Environmental Management Protected Areas Act (Act 57 of 2003)

(d) National Environmental Management Biodiversity Act (Act 10 of 2004)

(e) National Protected Area Expansion Strategy

(f) National Biodiversity Assessment (2004, updated 2011)

(g) National Freshwater Ecosystems Priority Atlas (2011)

(h) Mining and Biodiversity Guidelines. Mainstreaming biodiversity into the mining sector

(i) National Forests Act, 1998 (Act No. 84 of 1998)

The following information resources were consulted in order to ascertain whether any environmental features of biodiversity conservation concern occur, or could possibly occur within the study area:

(a) CITES;

(b) IUCN Red Data List;

(c) SANBI Red List of South African Plants;

(d) List of Protected Trees - National Forests Act, 1998 (Act No. 84 of 1998);

(e) ToPS List – Government Gazette Notice No. 389 of 2013: “Publication of Lists of species that are Threatened or Protected, Activities that are prohibited and Exemption from Restriction”;

(f) National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004);

(g) SANBI Biodiversity GIS:

(h) National Information

(i) Important Bird Areas (2015)

(j) DEA South African National Land-Cover (2013)

(k) Mining Guidelines (2013)

(l) Vegetation Map of Southern Africa (2012)

(m) National Biodiversity Assessment (2011)

(n) National Freshwater Ecosystem Priority Areas (2011)

(o) National List of Threatened Ecosystems (2011)

(p) Protected Areas (2010)

(q) National Land Cover (2009)

(r) National Wetlands Inventory (2006)

(s) National Spatial Biodiversity Assessment (2004)

(t) Soils (1940)

(u) Provincial Information

(v) KwaZulu-Natal Systematic Conservation Plan (KZNSCP) - 2010

(w) KwaZulu-Natal (KZN) Biodiversity Sector Plans 2014

(x) Specialist reports for assessments conducted on or close to the proposed prospecting area

The desktop study enabled the identification of sensitive environmental areas / habitats on the proposed site. These sensitive areas were considered during the impact assessment process. Mitigation measures / buffers are recommended to ensure that these areas are not impacted on.

The area of disturbance is considered small (0.17 ha), all impacts were rated as low - medium without mitigation and as low with the implementation of mitigation measures. Furthermore, adequate financial provision is made for rehabilitation. It should be noted that SAHRA has been consulted and their recommendation will be included in the Final BAR. Should SAHRA require it a Heritage Assessment will be conducted.

Apart from the Heritage Assessment no other specialist studies are required as the desktop study effectively identified sensitive areas, all impacts were considered to be of low - medium significance and appropriate mitigation and management measures are recommended.

9.5 ENVIRONMENTAL IMPACT STATEMENT

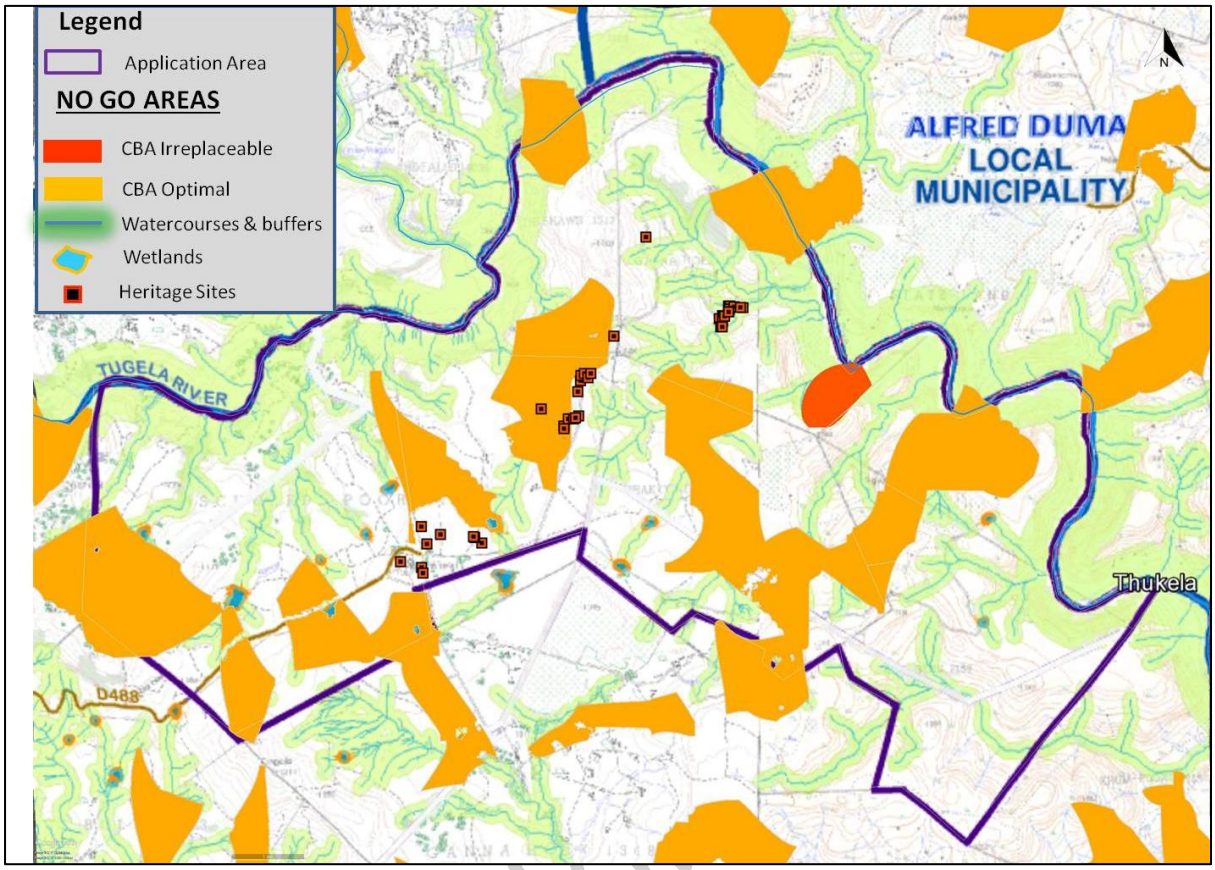
l) Environmental impact statement

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

The drilling will be done by a diamond drill rig, the drill team will not require site infrastructure and will stay in town or in existing dwellings on site. Water will be sourced from a commercial supplier and delivered to site by water tanker. The main impacts are associated with the heritage sites, CBA areas and surface water features present on the proposed prospecting area. The prospecting programme will be designed to avoid the CBA Irreplaceable area, identified heritage sites and to leave a buffer zone of 100 m from water courses and 500m from wetlands. A buffer of 30 m will be kept around CBA areas. Should the prospecting activities avoid the no-go areas as identified (Figure 48) the possible environmental impacts associated with the proposed prospecting are considered very low.

Based on the presented impact assessment the EAPs are of the opinion that the Dunrose Investments 174 prospecting project should be authorised.

Figure 48: No-Go Map



Source: EcoPartners

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers .Attach as Appendix 4

The location of proposed boreholes, will be established to comply with Joint Ore Reserves Committee (JORC) status drilling grids stepping out from known coal measures to be determined from the non-invasive geological mapping, and will be mainly located alongside existing and previously mapped roads and/or tracks on the properties. A preliminary activity map is provided in Figure 49.

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

Positive impacts associated with the proposed prospecting:

(a) Employment contributing to the economy

(b) The economic value of the mineral resource is determined

(c) Contribution to knowledge base in terms of Heritage Resources

Negative impacts associated with the proposed prospecting:

(a) Removal / damage of natural vegetation

(b) Damage to sensitive biodiversity areas - CBA Irreplaceable & Optimal Areas

(c) Loss of soil resources - trial pit areas

(d) Damage to ephemeral watercourses & wetlands

(e) Increase in erosion due to vegetation clearance & compaction

(f) Use of vehicles on site – compaction

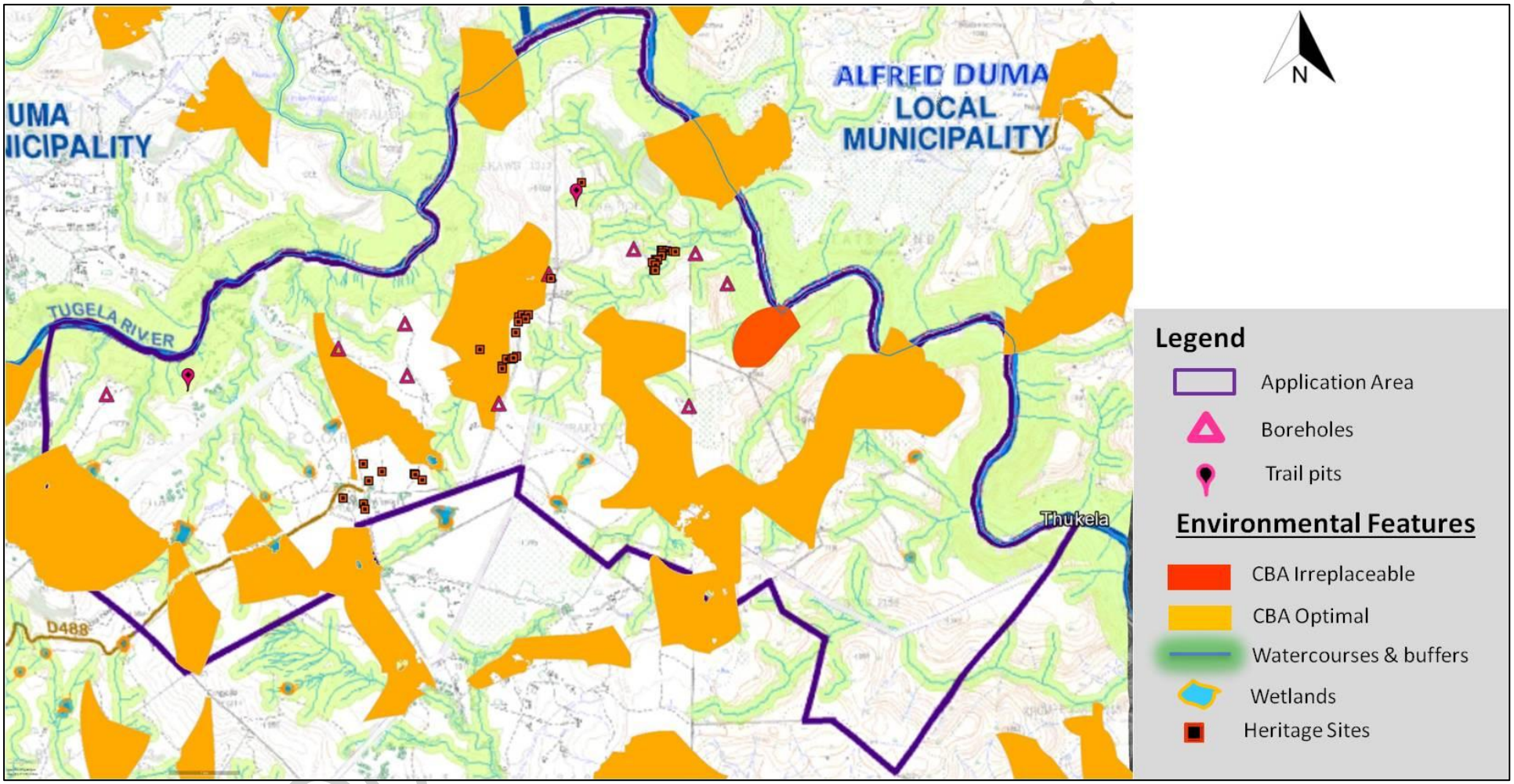
(g) Change of current land use

(h) Destruction of cultural heritage sites and artifacts

(i) Contamination of soils

(j) Litter

Figure 49: Activity Map



Source: EcoPartners

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

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

The objectives of the impact management process are as follows:

Air Quality:

To ensure that the prospecting activities has a minimal adverse impact on air quality. Dust limitation and suppression to be applied.

Groundwater:

To ensure that the prospecting activities have minimal adverse impact on the surrounding groundwater water quality and prevents pollution of existing groundwater resources.

Soils

To ensure that the prospecting activities does not have a negative impact on land and soils by mitigating potential erosion, preventing contamination and pollution.

Biodiversity

To ensure that the prospecting activities do not have an adverse impact on the CBA Irreplaceable and CBA Optimal areas. To ensure that no prospecting activities occur in CBA irreplaceable area situated on Portion 1 of the farm Gannahoek 1317 or in a buffer 30m form CBA areas. .

Socio-Economic

To aid in the improvement of the current local economy and improve the social environment of communities affected by the prospecting activities.

Visual

To limit the visual impact of the prospecting activities. A maximum of three drill rigs to be used and concurrent rehabilitation to be implemented

Noise

To control noise pollution stemming from the prospecting activities through the restriction of operational hours.

Heritage

To ensure that the prospecting activities avoid the heritage sites that have been identified and avoid adverse impacts on unidentified heritage resources of significance. Interaction with local residents to identify and confirm heritage sites. Marking and avoidance of sites if identified.

Waste

To ensure that the proposed prospecting operation adopts and implements waste management principles that are environmentally responsible.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

Prospecting should not occur within 50m of the any identified heritage resource.

No prospecting activities should occur in CBA Irreplaceable area located on Portion 1 of the farm Gannahoek 1317 and in a 30m buffer around CBA areas.

Prospecting should not occur within 100m from any watercourse or 500 m from any wetland without authorisation from DWS.

Water to be sourced from a commercial supplier and delivered to site by water tanker.

Boreholes, trial pits and access tracks to be located in areas that will result in the least ground disturbance

During the planning phase for each borehole or trial pit, specific controls must be identified and implemented, based on site conditions.

A field survey must be undertaken before drilling or trial pit activities commence at each drilling or trial pit activity site to confirm that no threatened species, cultural

heritage sites, ecologically sensitive areas or conservation important areas are present in sections to be cleared.

Collection of firewood will not be allowed.

Where an access road is needed, the relevant occupant and owner will be consulted prior to the development of that access to ensure that consensus is reached on the manner and the placement and how it will be rehabilitated at the end of the drilling programme.

o) Description of any assumptions, uncertainties and gaps in knowledge.
(Which relate to the assessment and mitigation measures proposed)

The presence of conservation important species on other portions apart from Schurfde Poort 1147 Portion 1.

Presence of other heritage sites on areas not previously assessed.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised
i) Reasons why the activity should be authorized or not.

This is a proposed prospecting application to determine the value of the coal resource. The holes will be drilled to a maximum depth of 75 m and will only be 0.3 - 0.5m in diameter.

Drilling will have low impact on then natural environment and is not expected to impact on unidentified heritage artefacts. The prospecting programme is limited to 10 boreholes and two trial pits over a total area of 6333.2240 ha. Prospecting activities will not occur within the CBA Irreplaceable area on Portion 1 of the farm Gannahoek 1317 or within a 30m buffer around CBA areas. No permanent structures or infrastructure will be required on site. Workers will stay in town or in existing dwellings on site. Water will be sourced from a commercial supplier and delivered to site by water tanker and will not be abstracted for surface or groundwater resources.

Rehabilitation will be done concurrently with prospecting. After drilling, when each site is left, a clearing team will restore the site and monitor its recovery. Any completed hole that is not required for groundwater monitoring, will be sealed with

cement to prevent groundwater contamination. All trial pits, sumps, cut-off trenches and berms will be rehabilitated.

The area will be shaped to avoid ponding of water. Vegetation will be allowed to establish on the topsoiled trial pit areas by means of natural colonisation, from the rich seed bed present in the topsoil as well as seed blown in from adjacent areas. The success of rehabilitation and vegetation establishment will be monitored on a 6 monthly basis (early winter and after the first rains).

Compacted areas (access roads, stockpile storage areas) will be scarified to a depth of 500 mm and topsoil cover will be restored. Indigenous vegetation will be encouraged to grow on the site. Remaining refuse, chemicals, fuels and waste materials will be removed from the site following the completion of the prospecting programme. Such waste will be disposed of to an approved landfill. An inspection on whether there is evidence of weeds or pest invasion as a result of prospecting activities will be undertaken and appropriate remediation actions will be implemented if required.

ii) Conditions that must be included in the authorisation

No prospecting activities will occur in the Irreplaceable Critical Biodiversity Area. Drill holes and trial pits will not be located closer than a 100 m to a watercourse or within 500 m from a wetland without authorisation from the Department of Water and Sanitation. Water to be sourced from a commercial supplier and delivered to site by water tanker. Holes and trial pits will not be located within 50 m from identified heritage resources and a buffer of a 100 m will be kept from provincial roads and all houses / dwellings that occur on the proposed prospecting area. A 30m buffer to be kept around CBA areas.

q) Period for which the Environmental Authorisation is required

3 years.

r) Undertaking

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

Dunrose Investments 174 (Pty) Ltd herewith confirm both its capacity and willingness to make the financial provision required should the prospecting right be granted.

9.6 FINANCIAL PROVISION

s) Financial Provision
State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

Grand Total = R 46,190.85

i) Explain how the aforesaid amount was derived.

General Surface Rehabilitation

The prospecting plan consists of drilling 10 boreholes and examining 2 trial pits. The existing road network on the property will be used where possible, to access the sites and no new infrastructure will be constructed. The exploration boreholes will be drilled to an average depth of 75 m. Additional pitting will be restricted to two small areas (*20 m long x 5 m wide*).

Drilling will take place at a maximum of three holes at a time. The drill sites will be cleared of obstructions and debris and then drilled. Rehabilitation will occur concurrently with drilling.

Experience in other sites have indicated that including the turning circle of vehicle, the area disturbed at the drill sites rarely exceeds 100m^2 or 0.01 ha per hole. For the drilling of the envisaged 10 holes (or 0.10 ha), and digging 2 trial pits (or 0.02 ha). The use of the existing road network on the property will be used where possible, however, provision is made for 500 m^2 new routes to be built. In total the areas to be affected will be approximately 0.17 ha. Fencing will be temporary.

2-3 years Maintenance and Aftercare

Should there be a need for maintenance and aftercare post the prospecting stage to ensure that the prospected areas have returned to their original state, an area of 0.15 ha, that includes all drill holes and trial pit sites, will be considered.

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

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

The financial support for Dunrose Investments 174 Pty (Ltd) proves the availability of funds to undertake prospecting the desired mineral.

9.7 SPECIFIC INFORMATION

t) Specific Information required by the competent Authority

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

(1) Impact on the socio-economic conditions of any directly affected person

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix .

Prospecting could affect the existing activities (commercial tourism & hunting, wood collecting subsistence farming & cattle grazing) of the communities where the proposed drill holes are located in the natural areas. Kindly refer Appendix 5 for the social economic impacts.

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

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

Several heritage sites were identified on the proposed prospecting area.

Stone walling / Iron Age settlement sites should be avoided and fenced-off for management protection. If impacted detailed archaeological mitigation should be undertaken. To be included in Cultural Resources Management Plan.

Stone Age tool scatters (Open-air sites) if impacted - Sampling of material for representative collection before destruction.

Possible graves should be fenced-off to manage/protect the sites. If required then the graves could be exhumed and relocated after the necessary permissions have been provided and detailed social consultation has been undertaken.

Terracing and recent homestead remains site should be recorded and mapped in detail should it be impacted on. The history of the site be should be researched. Otherwise avoid.

Iron Age Metal Working/Smelting Site - No prospecting activities allowed within 50m to halt destructive erosion now exposing the sites. The site should be preserved and researched in detail. The site should be fenced-in, details archaeological research and Long-term Management through an Implemented Cultural Heritage Resources Management Plan. Liaison with specialists, Amafa Kwazulu-Natal and other related Departments.

Other potential heritage sites will be identified during the planning phase to ensure that such areas are avoided. Each prospecting site will be visited prior to any work starting to identify possible heritage sites.

Prospecting activities will be kept away from excluded and exempted areas.

Where boreholes are sited in proximity to any heritage sites and depending on the proximity to the drilling or trial pit site, appropriate measures such as flagging, pegging or installation of temporary fencing will be undertaken to ensure that the site is not impacted on during prospecting. No specialist investigation has been conducted to date.

u) Other matters required in terms of sections 24(4)(a) and (b) of the Act.
(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 5).

Please refer to Appendix 5 for the Impact Table.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME

10 ENVIRONMENTAL MANAGEMENT PROGRAMME

1) Draft environmental management programme.

a) Details of the EAP,

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

Please refer to the Details of the EAP included in Part A, section 1(a).

b) Description of the Aspects of the Activity

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

The aspects of the activity are described in Part A Section 1(h).

c) Composite Map

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

Please refer to Appendix 2.

d) Description of Impact management objectives including management statements

i) Determination of closure objectives.

(Ensure that the closure objectives are informed by the type of environment described)

The overall goal for closure of the prospecting site is to re-instate the predetermined land-use of the land owners, neighbours and community, ensuring that the land is stable and safe in the long-term.

The closure objectives apply to the prospecting area in its final closed state and not whilst the site is in transformation towards this state. They nevertheless provide guidance during the operational phase. Closure objectives relate to the following:

Physical stability: To back-fill boreholes & pits on the prospecting site to ensure continuation of the land use after completion of prospecting activities.

Environmental quality: To ensure that local environmental quality is not adversely affected by possible physical effects and chemical contaminants arising from the prospecting site after completion of prospecting activities.

Health and safety: To limit the possible health and safety threats to humans and animals using the rehabilitated prospecting area after completion of prospecting activities.

Land capability/land-use: To ensure continuation or to the re-instate a suitable land capability over as large as possible area affected during prospecting.

Aesthetic quality: To leave behind a rehabilitated prospecting site that is neat and tidy, giving an acceptable overall aesthetic appearance.

Biodiversity: To encourage the re-establishment of indigenous and/ or appropriate vegetation on the rehabilitated prospecting site, such that the biodiversity is largely re-instated over time, as well as protect the undisturbed areas to maintain/enhance the biodiversity of these areas. The prospecting area should be rehabilitated to limit the impact on the current land use

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

The drilling rig will require approximately $4m^3$/day. Water will be sourced from a commercial supplier and delivered to site by water tanker.

iii) Has a water use licence has been applied for?

No Water use license is required for the prospecting application. Water will be sourced from commercial supplier and transported in via road tanker.

Should prospecting activities occur within 100m of any watercourse or within 500m from any wetland authorisation from DWS will be required.

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

Table 10: Impact mitigation

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
*(**E.g. For prospecting** - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining,-** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)*	*(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).*	*of disturbance (volumes, tonnages and hectares or m²)*	*(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	*(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	*Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.*
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0.17 ha (drill sites, trial pits and access routes)	1) Boreholes, trial pits and access tracks will be located in areas that will result in the least ground disturbance. 2) Permission will be obtained from landowners before trees are felled, pick and transport permits will be obtained in the event that it is a conservation important species. 3) Where an access road is needed, the relevant occupant and owner will be consulted prior to the development of that access road to ensure that consensus is reached on the manner and the placement and how it will be rehabilitated at the end of the drilling	Concurrent rehabilitation in line with sustainable development practices	During drill site establishment

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			programme. 4) Vegetation clearance will be limited to 0.01 ha per drill hole		
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0.12 ha (drill sites without access roads)	1) Topsoil will be stripped to a depth of 250 mm from all disturbed areas and stored outside the 1:50 year flood levels of watercourses, within the firebreak area. 2) Topsoil will be adequately protected from being blown away or being eroded. 3) Boreholes and access tracks will be located in areas that will result in minimal ground disturbance.	Storage of topsoil in line with Regulation 70 of GN 527 (2004)	During drill site establishment & drill operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	The drilling of 10 drill holes of 0.3 to 0.5m in diameter - creation of 2 trial pits	1) During the planning phase for each borehole or trial pit, specific controls will be identified and implemented, based on site conditions. 2) Only 10 drill holes and two trial pits will be made 3) Areas will be rehabilitated concurrently	Number of boreholes and trial pits stipulated in Prospecting Work Programme	During drilling operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0.17ha (drill sites, trial pits and access routes)	1) Land disturbed will be rehabilitated to a stable and permanent form, suitable for subsequent land use. 2) Exact location of drill holes, trial pits and new access routes will be determined through communication with the land owner	Concurrent rehabilitation in line with sustainable development practices	Prior to drill site establishment
Vegetation clearance, Site establishment , Drilling activities, digging of trial pits & movement of people and equipment on site	Operational	0. 17 ha (drill sites, trial pits, access routes)	1) Stone walling / Iron Age settlement sites should be avoided and fenced-off for management protection. If impacted, detailed archaeological mitigation should be undertaken. To be	Avoidance in line with National Heritage Resources Act (No. 25 of 1999)	Prior to drill site establishment

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			included in Cultural Resources Management Plan. 2) Stone Age tool scatters (Open-air sites) if impacted - Sampling of material for representative collection before destruction 3) Possible sites should be fenced-off to manage/protect the sites. If required then the graves could be exhumed and relocated after the necessary permissions have been provided and detailed social consultation has been undertaken. 4) Terracing and recent homestead remains site should be recorded and mapped in detail should it be impacted on. The history of the site be should be researched. Otherwise avoid. 5) Iron Age Metal Working/Smelting Site - No prospecting activities allowed within 50 m to halt destructive erosion now exposing the sites. The site should be preserved and researched in detail. The site should be fenced-in, details archaeological research and Long-term Management through an Implemented Cultural Heritage Resources Management Plan. Liaison with specialists, Amafa Kwazulu-Natal and other related Departments. 6) Other potential heritage sites will be identified during the planning phase to ensure that such areas are avoided.		

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Each prospecting site will be visited prior to any work starting to identify possible heritage sites. 7) Prospecting activities will be kept away from excluded and exempted areas. 8) Where boreholes are sited in proximity to any heritage sites and depending on the proximity to the drilling or trial pit site, appropriate measures such as flagging, pegging or installation of temporary fencing will be undertaken to ensure that the site is not impacted on during prospecting.		
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0. 17 ha (drill sites, trial pits, access routes)	1) No drilling or trial pit activities will take place in the KZN irreplaceable areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared.	Avoidance in line with National Biodiversity Act (10 of 2004)	Prior to drill site establishment
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0. 17 ha (drill sites, trial pits, access routes)	1) No drilling or trial pit activities will take place in the KZN Optimal areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared. 3) Areas of ecological significance will be avoided and if disturbance is	Avoidance in line with National Biodiversity Act (10 of 2004) / Authorisation	Prior to drill site establishment

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			required, it will be undertaken with the appropriate environmental authorization - Listing 3 Activity included in this application.		
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0. 17 ha (drill sites, trial pits, access routes)	1) No prospecting activity within 100 m of watercourses or 50m to wetlands without authorisation from DWS 2)Controls will be aimed at reducing erosion and sediment washing from drill pads, access roads and other disturbed areas. 3) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into water courses, farm dams and wetlands. 4) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching. 5) A buffer of 30m to be kept around CBA areas	Protection of wetland and riparian vegetation & buffers in line with National Water Act (Act 36 of 1998)	During drill site establishment & drilling operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0. 17 ha (drill sites, trial pits & access routes)	1) Dust will be effectively controlled in all areas cleared from vegetation through water spraying or other soil stabilization techniques. 2) The impact on air quality can be reduced by considering alternative soil stabilisation techniques, like but not limited to, re-vegetating areas. 3) Other alternatives for stabilisation include the covering of areas with mulch or alternatively use organic material to cover areas where the vegetation has	National Dust Control Regulations GN 827 (2013)	During drill site establishment & drilling operations

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			been cleared.		
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0.17ha (drill sites, trial pits & access routes)	1) Prospecting activities will be discussed with landowners / occupiers prior to work commencing. 2) Drill holes, trial pits and access routes not wanted by land owners on completion of prospecting activities will be rehabilitated	Concurrent rehabilitation in line with sustainable development practices	During to drill site establishment & drilling operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	0.17ha (drill sites, trial pits & access routes)	1) Controls will be aimed at reducing erosion and sediment washing from drill pads, access roads and other disturbed areas. 2) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into watercourses, farm dams and wetlands. 3) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching.	Storm water management in line with National Water Act (36 of 1998)	For duration of prospecting activities on site
Workers & material on site	Operational	0.17ha (drill sites, trial pits & access routes)	1) A chemical toilet will be used on site during prospecting and will be used in such a way as to prevent water pollution. The use of a chemical toilet will be undertaken in consultation with the landowner. 2) Full or leaking toilets must be reported to the Supervisor for corrective action or replacement. 3) Prospecting areas will be maintained in a clean and tidy condition at all times. 4) All waste will be collected, separated and stored in properly constructed	Maintenance and replacement of chemical toilets in line with Regulation 71 of GN 527 (2004). Waste collection and disposal in line with Regulation 69 of GN 527 of 2004 and with National Environmental Management: Waste Act (59 of 2008)	For duration of prospecting activities on site

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			containers with lids and removed to an approved landfill or another site according to local municipal requirements. 5) Full waste bins must be reported to the Supervisor for collection and disposal at an approved landfill.		
Workers & material on site	Operational	6333.224 ha (Total size of prospecting area - 10 - 12 workers on site)	1) Employees will stay in town or in existing dwellings on site. 2) Hunting / poaching will not be allowed. 3) Maximum of three drill site will be active at any given time. 4) All employees will be present at the drill sites with appropriate supervision.	No poaching in line with Animals Protection Act (No. 71 of 1962)	For duration of prospecting activities on site
Workers & material on site	Operational	6333.224 ha (Total size of prospecting area)	1) Vegetation around each exploration site within a 5m radius will be kept short to create a fire management zone. 2) Collection of firewood will not be allowed. 3) Open fires will be prohibited to people involved in prospecting. 4) No burning cigarettes or matches may be thrown down within the prospecting area. A bucket with sand will be provided for the disposal of cigarettes and matches. 5) No smoking will be allowed near gas, paints or fuel storage areas. 6) Suitable welding blankets are to be used when welding or operating grinders and this equipment is to be serviced regularly.	Fire prevention in line with Regulation 65 of GN 527 (2004) and with National Veldt and Forest Fire Act	For duration of prospecting activities on site

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			7) Rubbish or vegetation may under no circumstances be burnt. All waste will be removed off site and disposed of at an approved landfill.		
Workers & material on site	Operational	6333.224 ha (Total size of prospecting area - 10 - 12 workers on site)	1) Collection of firewood will not be allowed. 2) Maximum of three drill sites will be active at any given time. 3) All employees will be present at the drill sites with appropriate supervision 4) Complaints and outcomes of subsequent investigations will be recorded in a Complaints Register that will be available for inspection. 5) If damage to private property occurs as a result of prospecting activities, such damage will be repaired or owners will be compensated as appropriate.	Conditions stipulated in Access Agreement	For duration of prospecting activities on site
Workers & material on site	Operational	10 - 12 workers on site	1) Due to the nature of prospecting, employment opportunities will be minimal. The prospecting crew is small (10 - 12 people) with specialised skills. Were possible, local people will however be employed during the project. 2) Local people and businesses with appropriate skills will be identified and included in the project tender process. The applicant is committed to employ local people and make use of local businesses during the project, where possible.	Contractual agreements between the service provider and the applicant	For duration of prospecting activities on site
Workers & material on site	Operational	10- 12	1) Visual inspections for snakes will be		For duration of

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
		workers on site	conducted before any work will commence in a specific area. 2) Workers will be instructed to be aware of the possible presence of snakes at all times. 3) Workers will be trained on what emergency actions to take in case of a snake bite.		prospecting activities on site
Workers & material on site	Operational	10 - 12 workers on site	1) Due to the nature of prospecting, a limited amount of employees (10 - 12 people) will come to site daily to work and then leave for their own accommodation at night. 2) Employees will stay in town or in existing dwellings on site. 3) Aids awareness talks will be conducted.	National Strategic Plan on HIV, STIs and TB 2012-2016	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or trial pit activities	Operational	Maximum of 3 x drill rigs, 3 x field vehicles, 1 x water bowser,	1) Vehicles and equipment to be serviced regularly and maintained in good working condition	Maintenance of vehicles and equipment in line with responsible environmental management practice	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Maximum of 3 x drill rigs, 3 x field vehicles, 1 x water bowser	1) All chemicals, fuels and oils to be stored on site will be appropriately bunded. 2) Precautions will be taken to prevent spills and soil contamination (e.g. use of drip trays) 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up	Prevention of soil pollution in line with Regulation 70 of GN 527 (2004)	For duration of prospecting activities on site

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			requirements to ensure correct clean-up procedures. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism.		
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	10 drill sites	1) Water will be sourced from a commercial supplier and delivered to site by water tanker and stored in water bowsers. 2) Adequate provision will be made for storing drinking water on site in the form of 2500 litre water tanks.	Responsible use of groundwater resources in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	6333.224 ha (Total size of prospecting area)	1) Machinery and equipment will only be maintained over a drip tray, a thin concrete slab or a PVC lining to prevent soil and water contamination. 2) No vehicle will be extensively repaired on site. 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedures. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism.	Prevention of groundwater pollution in line with National Water Act (36 of 1998)	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling	Operational	0.17ha (drill sites, trial pits & access routes)	1) The drilling fluid that will be used during prospecting must be biodegradable and not pose a water pollution threat. 2) Drilling sumps and containment	Prevention of groundwater pollution in line with National Water Act (36 of 1998)	For duration of prospecting activities on site

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			measures will be designed to contain all drilling fluid. 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements top ensure correct clean-up procedure. 4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site or other legal disposal mechanism. 5) No drill site or trial pit will be located within 100m from watercourses or within 500m from wetlands unless authorisation has been obtained from DWS.		
Use of heavy machinery & vehicles on site for drilling	Operational	10 Boreholes	1) For the purpose of future monitoring programmes, impact assessments and concurrent rehabilitation, the depth of water strikes will be recorded during exploration drilling. 2) The static groundwater level will be monitored in prospecting boreholes that intersected water after completion and before concurrent rehabilitation for future monitoring, impact assessment and concurrent rehabilitation purposes. 3) Any completed hole that is not required for groundwater monitoring, will be sealed to prevent groundwater contamination.	Prevention of groundwater pollution in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or	Operational	0. 17 ha (drill sites,	1) Stay on predefined areas and routes. 2) Scarify access roads and stockpile	Concurrent rehabilitation in line	Concurrently on completion of drilling

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
digging trial pits		trial pits and access routes)	areas to a depth of 500 mm and restore topsoil cover. 3) Re-seed or plant vegetation indigenous to the area.	with sustainable development practices	activities at drill site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	0. 17 ha (drill sites, trial pits an access routes)	1) Vehicles will only stay on dedicated roads (turning circles). 2) No movement of heavy machinery outside dedicated routes. 3) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.	Concurrent rehabilitation in line with sustainable development practices	Concurrently on completion of drilling activities at drill site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	0. 17 ha (drill sites, trial pits an access routes)	1) No prospecting activities will occur within CBA Irreplaceable areas or in 30 m buffer around CBA areas. 2) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken with the appropriate environmental authorization - Listing 3 Activity included in this application. 3) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared. 4) No movement of heavy machinery outside dedicated routes. 5) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it.	Avoidance in line with National Biodiversity Act (10 of 2004) / Authorisation	Prior to drill site establishment

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	0. 17 ha (drill sites, trial pits an access routes)	1) No prospecting activities will be allowed closer than 100 m from water courses & farm dams or within 500 m from wetlands without authorisation from DWS 2) Vehicles will only stay on dedicated roads (turning circles). 3) No movement of heavy machinery outside dedicated routes. 4) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area, if the landowner is not still utilising it. 5) A buffer of 30 m nust be kept around CBA areas	Buffers in line in requirements from DWS . Concurrent rehabilitation in line with sustainable development practices	Concurrently on completion of drilling activities at drill site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Maximum of 3 x drill rigs, 3 x field vehicles, 1 x water bowser	1) Vehicles and equipment will be maintained in a good working order.	Maintenance of vehicles and equipment in line with responsible environmental management practice	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	0. 17 ha (drill sites, trial pits and access routes)	1) Speed limits on gravel roads will be 40 km/hr to reduce dust and noise generation. 2) Dust will be effectively controlled in all disturbed areas through water spraying or other soil stabilization techniques. 3) The type and compaction of road building material, can reduce the amount of dust generated.	National Dust Control Regulations GN 827 (2013)	During drill site establishment & drilling operations
Use of heavy machinery &	Operational	Maximum	1) Speed limits on gravel roads will be	Noise Standards -	For duration of

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
vehicles on site for drilling or digging trial pit activities		of 3 x drill rigs, 3 x field vehicles, 1 x water bowser	40 km/hr to reduce dust and noise generation. 2) Prospecting activities will be restricted to day light hours.	SANS 10103:2008	prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Maximum of 3 x drill rigs	1) A maximum of three drill sites to be drilled at any one time 2) Concurrent rehabilitation		For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	0. 17 ha (drill sites, trial pits and access routes)	1) Prospecting activities will be kept away from CBA Irreplaceable and other excluded and exempted areas. 2) A field survey will be undertaken before drilling or trial pit activities commence at each drilling or trial pit activity site to confirm that no threatened species, ecologically sensitive areas or conservation important areas are present in sections to be cleared. 3) Areas of ecological significance (CBA Optimal) will be avoided and if disturbance cannot be avoided, it will be undertaken in accordance with legislation - Listing Notice 3 Activity included in this application. 4) No bird nests will be disturbed 5) Maximum of three sites to be drilled at any time. 6) Concurrent rehabilitation.	Number of boreholes and trial pits stipulated in Prospecting Work Programme	During drilling operations
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	0. 17 ha (drill sites, trial pits	1) Machinery will be cleared of dust/mud and seed prior to relocation to the next site to prevent the spread of	Prevention of proliferation of invasive plant species	For duration of prospecting activities on site

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
		and access routes)	alien invasive species.	in line with National Environmental Management Biodiversity Act (10 of 2004)	
Closure					
Concurrent rehabilitation	Closure	0. 17 ha (drill sites, trial pits and access routes)	1) Remaining refuse, chemicals, fuels and waste materials will be removed from the site following the completion of the prospecting programme. Such waste will be disposed of to an approved landfill. 2) Erosion and sediment controls as well as the disturbed area will be rehabilitated. 3) An inspection on whether there is evidence of weeds or pest invasion as a result of prospecting activities will be undertaken and appropriate remediation actions will be implemented as required.	Concurrent rehabilitation in line with sustainable development practices	During drilling operations after site has been rehabilitated
Concurrent rehabilitation	Closure	0. 17 ha (drill sites, trial pits and access routes)	1) Scarify access roads and stockpile storage areas to a depth of 500 mm. 2) Restore topsoil cover. 3) Re-seed or plant vegetation indigenous to the area.	Concurrent rehabilitation in line with sustainable development practices	During drilling operations after site has been rehabilitated
Close drill hole	Closure	10 Boreholes	1) Exploration boreholes are to be capped when no drilling work is being undertaken. 2) Exploration boreholes which will not be used during production to be sealed with cement once exploration work has been completed.	Capping of boreholes in line with sustainable management principles	For duration of prospecting activities on site

e) Impact Management Outcomes

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

Table 11: Impact management

ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
(whether listed or not listed). (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).	In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)		(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. • Modify through alternative method. • Control through noise control; Control through management and monitoring remedy through rehabilitation..	(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Removal of / damage to natural vegetation	Vegetation	Control through limiting area	Rehabilitate impacted area to be in line with current land use
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil	Soils	Control through storing of topsoil and protecting topsoil stockpiles	Impact avoided through storage of topsoil
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill	Operational	Changes to the shape or form of the land	Topography	Remedy through concurrent rehabilitation of drill sites & trial pits	Rehabilitate impacted area to be in line with

ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
sites					current land use
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Impact on current land use	Land Use & Land Capability	Control via communication with land owner	Minimise disturbance to and alternation of current land use practices
Vegetation clearance, Site establishment , Drilling activities, digging of trial pits & movement of people and equipment on site	Operational	Destruction of cultural heritage sites and artefacts	Cultural Heritage	Stop through avoidance of sites, fencing or buffer of 50m & identification of other sites and protecting	Avoid impact - identify as no go area. SAHRA authorisation.
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Damage to sensitive biodiversity areas CBA Irreplaceable)	Biodiversity (KZN Irreplaceable Areas)	Stop through avoidance of drilling & pitting in CBA Irreplaceable areas and identification of other areas	Impact avoided
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Damage to sensitive biodiversity areas (CBA Optimal)	Biodiversity (KZN Optimal Areas)	Stop through avoidance of drilling in CBA Optimal Areas or Control through Authorisation Conditions	Impact avoided / Authorisation - Listing Notice 3 Activity
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Damage to wetland / riparian vegetation	Wetland / Riparian Vegetation	Avoid through buffers / Control through authorisation	No destruction of wetland or riparian vegetation
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Air Quality Impact (Dust)	Air Quality	Control through dust suppression	Dust suppression to ensure dust fall out is below thresholds stipulated in Dust Control Regulations
Vegetation clearance for establishment of trial pits &	Operational	Disturbance of commercial & community activities on site	Social and Economic	Control via communication with land owner / Occupier	Minimise disturbance of

ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
cutting of vegetation at drill sites			Environment		current activities on area
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Operational	Storm water run-off from cleared areas could lead to siltation of water courses, farm dams and wetlands	Surface Water	Control through establishment of erosion control structures / features	Avoid storm water runoff from cleared areas into watercourses, dams & wetlands
Workers & material on site	Operational	Contamination of soils through spills from sanitation facilities & litter	Soils	Control through placement of facility and regular maintenance. Collection of waste	Impact to be controlled to avoid contamination of soil
Workers & material on site	Operational	Poaching / Killing of snakes & animals	Fauna	Control through supervision and operational hours on site	No loss of cattle and/ or wildlife
Workers & material on site	Operational	Fire	Social and Economic & Ecology Environment	Avoid through Code of Conduct & Control through Fire Breaks	No fires
Workers & material on site	Operational	Collection of fire wood, damage to property	Vegetation	Control through supervision and operational hours on site	No complaints from land owners, no collection of fire wood
Workers & material on site	Operational	Contribution to the economy through employment	Social and Economic Environment	Employment of local people and businesses where possible	Creation of employment opportunities
Workers & material on site	Operational	Snake bites	Safety	Control through supervision, training and awareness.	Impact to be avoided
Workers & material on site	Operational	Spread of HIV/Aids to local community	Social and Economic Environment	Control through awareness	Impact to be avoided
Use of heavy machinery &	Operational	Resource consumption (diesel -	Fossil fuels	Control through	Well maintained

ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
vehicles on site for drilling or trial pit activities		non-renewable resource)		maintenance	equipment & vehicles (annually)
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Contamination of soils through hydrocarbon leaks and spills from machinery & equipment	Soils	Avoid through engineering controls. Remedy through clean-up	No hydrocarbon spillages
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Use of groundwater for drilling or trial pits activities	Groundwater	Avoid through sourcing of water from commercial supplier	No abstraction of groundwater
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment	Groundwater	Avoidance through engineering controls and clean-up	No groundwater contamination
Use of heavy machinery & vehicles on site for drilling	Operational	Contamination of water courses, wetlands and farm dams through hydrocarbon leaks and spills from machinery & equipment	Surface Water	Avoidance through engineering controls and clean-up	No surface water contamination
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Compaction of soils through movement of heavy vehicles and machinery on site	Soils	Avoid through limiting area. Remedy through concurrent rehabilitation	Limit areas of compaction. Rehabilitate impacted area to be in line with current land use
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Damage to vegetation	Vegetation	Avoid through limiting area. Remedy through concurrent rehabilitation	Limit areas. Rehabilitate impacted area to be in line with current land use
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Damage to CBA Irreplaceable & Optimal Areas	Biodiversity	Stop through avoidance of drilling & pitting in CBA Irreplaceable areas/ Control through Authorisation Buffer of 30 m	Impact avoided / Authorisation - Listing Notice 3 Activity

ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Damage to riparian and wetland vegetation	Vegetation	Avoid through buffers. Remedy through concurrent rehabilitation	No activity closer than 100 m from water courses or 500 m from wetlands without authorisation from DWS. Limit areas. Rehabilitate impacted area to be in line with current land use
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Release of gaseous emissions	Air Quality	Control through maintenance	Well maintained equipment & vehicles (annually)
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Air Quality Impact (Dust)	Air Quality	Control through speed limit & dust suppression	Dust suppression to ensure dust fall out is below thresholds stipulated in Dust Control Regulations
Use of heavy machinery & vehicles on site for drilling or digging trial pit activities	Operational	Increase in ambient noise levels	Social and Economic Environment	Control through speed limit & operational times	Ambient noise levels to be below thresholds stipulated in SANS 10103:2008 for sub-urban sound environment-
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Visual intrusion	Social and Economic Environment	Control through limiting amount of drill rigs on property	No complaints from land owners.
Use of heavy machinery &	Operational	Disturbance of fauna species in the	Fauna	Remedy through	Rehabilitate

ACTIVITY	PHASE	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
vehicles on site for drilling or digging trial pits		vicinity		concurrent rehabilitation of drill sites & trial pits	impacted area to be in line with current land use
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Operational	Proliferation of invasive plant species	Vegetation	Avoid through cleaning of machinery	No proliferation of invasive plant species
Closure					
Concurrent rehabilitation	Closure	Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion	Land Use & Land Capability	Remedy through concurrent rehabilitation of drill sites & trial pits	Rehabilitate impacted area to be in line with current land use
Concurrent rehabilitation	Closure	Use stockpiled top soil to close sumps and trial pits	Soils		Rehabilitate impacted area to be in line with current land use
Close drill hole	Closure	Restoration of land use and land capability	Land Use & Land Capability	Control through capping of boreholes	Capping of all boreholes

f) 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).

Table 21: Management Actions

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
whether listed or not listed. (E.g. Excavations, blasting, stockpiles,	*(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination,*	*(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust*	*(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2*	*Describe the time period when the measures in the environmental management programme*

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).	*groundwater contamination, air pollution etc….etc…)*	*control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation..*	*herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	*must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- .Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.*
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Removal of / damage to natural vegetation	Control through limiting area	Concurrent rehabilitation in line with sustainable development practices	During drill site establishment
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil	Control through storing of topsoil and protecting topsoil stockpiles	Storage of topsoil in line with Regulation 70 of GN 527 (2004)	During drill site establishment & drill operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Changes to the shape or form of the land	Remedy through concurrent rehabilitation of drill sites & trial pits	Number of boreholes and trial pits stipulated in Prospecting Work Programme	During drilling operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Impact on current land use	Control via communication with land owner	Concurrent rehabilitation in line with sustainable development practices	Prior to drill site establishment

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Vegetation clearance, Site establishment , Drilling activities, digging of trial pits & movement of people and equipment on site	Destruction of cultural heritage sites and artefacts	Stop through avoidance of sites, fencing or buffer of 50m & identification of other sites and protecting	Avoidance in line with National Heritage Resources Act (No. 25 of 1999)	Prior to drill site establishment
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to sensitive biodiversity areas CBA Irreplaceable)	Stop through avoidance of drilling & pitting in CBA Irreplaceable areas and identification of other areas. Buffer 30 m	Avoidance in line with National Biodiversity Act (10 of 2004)	Prior to drill site establishment
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to sensitive biodiversity areas (CBA Optimal)	Stop through avoidance of drilling in CBA Optimal Areas or Control through Authorisation Conditions, buffer 30 m	Avoidance in line with National Biodiversity Act (10 of 2004) / Authorisation	Prior to drill site establishment
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to wetland / riparian vegetation	Avoid through buffers / Control through authorisation	Protection of wetland and riparian vegetation & buffers in line with National Water Act (Act 36 of 1998)	During drill site establishment & drilling operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Air Quality Impact (Dust)	Control through dust suppression	National Dust Control Regulations GN 827 (2013)	During drill site establishment & drilling operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Disturbance of commercial & community activities on site	Control via communication with land owner / Occupier	Concurrent rehabilitation in line with sustainable development practices	During to drill site establishment & drilling operations
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Storm water run-off from cleared areas could lead to siltation of water courses, farm dams and wetlands	Control through establishment of erosion control structures / features	Storm water management in ine with National Water Act (36 of 1998)	For duration of prospecting activities on site

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Workers & material on site	Contamination of soils through spills from sanitation facilities & litter	Control through placement of facility and regular maintenance. Collection of waste	Maintenance and replacement of chemical toilets in line with Regulation 71 of GN 527 (2004). Waste collection and disposal in line with Regulation 69 of GN 527 of 2004 and with National Environmental Management: Waste Act (59 of 2008)	For duration of prospecting activities on site
Workers & material on site	Poaching / Killing of snakes & animals	Control through supervision and operational hours on site	No poaching in line with Animals Protection Act (No. 71 of 1962)	For duration of prospecting activities on site
Workers & material on site	Fire	Avoid through Code of Conduct & Control through Fire Breaks	Fire prevention in line with Regulation 65 of GN 527 (2004) and with National Veldt and Forest Fire Act	For duration of prospecting activities on site
Workers & material on site	Collection of fire wood, damage to property	Control through supervision and operational hours on site	Conditions stipulated in Access Agreement	For duration of prospecting activities on site
Workers & material on site	Contribution to the economy through employment	Employment of local people and businesses where possible	Contractual agreements between the service provider and the applicant	For duration of prospecting activities on site
Workers & material on site	Snake bites	Control through supervision, training and awareness.		For duration of prospecting activities on site
Workers & material on site	Spread of HIV/Aids to local community	Control through awareness	National Strategic Plan on HIV, STIs and TB 2012-2016	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or trial pit activities	Resource consumption (diesel - non-renewable resource)	Control through maintenance	Maintenance of vehicles and equipment in line with responsible environmental	For duration of prospecting activities on site

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			management practice	
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of soils through hydrocarbon leaks and spills from machinery & equipment	Avoid through engineering controls. Remedy through clean-up	Prevention of soil pollution in line with Regulation 70 of GN 527 (2004)	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Use of groundwater for drilling or trial pits activities	Avoid through sourcing of water from commercial supplier	Responsible use of groundwater resources in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment	Avoidance through engineering controls and clean-up	Prevention of groundwater pollution in line with National Water Act (36 of 1998)	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling	Contamination of water courses, wetlands and farm dams through hydrocarbon leaks and spills from machinery & equipment	Avoidance through engineering controls and clean-up	Prevention of groundwater pollution in line with National Water Act (36 of 1998)	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Compaction of soils through movement of heavy vehicles and machinery on site	Avoid through limiting area. Remedy through concurrent rehabilitation	Concurrent rehabilitation in line with sustainable development practices	Concurrently on completion of drilling activities at drill site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to vegetation	Avoid through limiting area. Remedy through concurrent rehabilitation	Concurrent rehabilitation in line with sustainable development practices	Concurrently on completion of drilling activities at drill site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to CBA Irreplaceable & Optimal Areas	Stop through avoidance of drilling & pitting in CBA Irreplaceable areas/ Control through	Avoidance in line with National Biodiversity Act (10 of 2004) / Authorisation	Prior to drill site establishment

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
		Authorisation		
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to riparian and wetland vegetation	Avoid through buffers. Remedy through concurrent rehabilitation	Buffers in line in requirements from DWS. Concurrent rehabilitation in line with sustainable development practices	Concurrently on completion of drilling activities at drill site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Release of gaseous emissions	Control through maintenance	Maintenance of vehicles and equipment in line with responsible environmental management practice	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Air Quality Impact (Dust)	Control through speed limit & dust suppression	National Dust Control Regulations GN 827 (2013)	During drill site establishment & drilling operations
Use of heavy machinery & vehicles on site for drilling or digging trial pit activities	Increase in ambient noise levels	Control through speed limit & operational times	Noise Standards - SANS 10103:2008	For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Visual intrusion	Control through limiting amount of drill rigs on property		For duration of prospecting activities on site
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Disturbance of fauna species in the vicinity	Remedy through concurrent rehabilitation of drill sites & trial pits	Number of boreholes and trial pits stipulated in Prospecting Work Programme	During drilling operations
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Proliferation of invasive plant species	Avoid through cleaning of machinery	Prevention of proliferation of invasive plant species in line with National Environmental Management Biodiversity Act (10 of 2004)	For duration of prospecting activities on site
Closure				
Concurrent rehabilitation	Reducing soil compaction of disturbed area and access roads to improve	Remedy through concurrent rehabilitation of drill sites & trial pits	Concurrent rehabilitation in line with sustainable development practices	During drilling operations after site has been rehabilitated

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
	drainage and control erosion			
Concurrent rehabilitation	Use stockpiled top soil to close sumps and trial pits		Concurrent rehabilitation in line with sustainable development practices	During drilling operations after site has been rehabilitated
Close drill hole	Restoration of land use and land capability	Control through capping of boreholes	Capping of boreholes in line with sustainable management principles	For duration of prospecting activities on site

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

The following closure objectives will be applicable for concurrent rehabilitation:

Land disturbed will be rehabilitated to a stable and permanent form suitable for subsequent land use e.g. eco-tourism, farming and cattle grazing.

The final land use will be similar to surrounding land-use i.e. natural areas (over time) and cattle grazing

There will be no adverse environmental effect outside the small disturbed areas (0.17 ha) and the affected area will be shaped to ensure effective drainage.

The closure objectives are to reduce disturbance wherever possible so that normal land use can continue after closure.

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

The closure objectives as outlined above will be made available to all land owners and I&APs during the period for comment on the BAR. Comments received in terms of the environmental objectives in terms of closure will be inserted here.

Because the closure objectives are to reduce disturbance wherever possible so that normal land use can continue after closure, closure will not adversely affect the rights of the landowners or I&APs.

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

Please note this is an application for the prospecting of coal. Approximately 10 holes will be drilled and 2 trial pits (20m long x 5m wide) will be created. Drilled holes and trial pits will be closed/ rehabilitated concurrently with drilling.

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

Safety after the completion of the prospecting activities will be done by concurrent rehabilitation of drill holes. Overburden & coal will be recorded and the holes filled back upon completion. The two trial pits will also be rehabilitated concurrently. Overburden and topsoil will be replaced.

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

Please refer to Quantum Appendix 6.

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

Dunrose 174 Investments (Pty) Ltd herewith confirms both its capacity and willingness to make the financial provision required should the prospecting right be granted.

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

g) Monitoring of Impact Management Actions
h) Monitoring and reporting frequency
i) Responsible persons
j) Time period for implementing impact management actions
k) Mechanism for monitoring compliance

Although no significant impacts were identified after the appliance of mitigation measures monitoring requirements for all impacts identified are provided below to ensure that all activities are effectively managed.

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
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Removal of / damage to natural vegetation	Visual checks that no more than 0.01 ha vegetation is removed per drill hole	Site supervisor	Performance Assessment & Reporting as stipulated in EA Application for Closure Certificate
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil	Ensure removal of 250 mm topsoil and storage thereof. Visual checks to ensure topsoil stockpile is protected from being blown away or being eroded.	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Changes to the shape or form of the land	Drill equipment - 0.3 to 0.5m drill rigs. Trial pits limited to 2	Site supervisor	Performance Assessment & Reporting as stipulated in EA Application for Closure Certificate
Vegetation clearance for establishment of	Impact on current land use	Communication with land owner. Access agreement	Site supervisor	Performance Assessment & Reporting as stipulated in

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
trial pits & cutting of vegetation at drill sites		conditions		EA Application for Closure Certificate
Vegetation clearance, Site establishment , Drilling activities, digging of trial pits & movement of people and equipment on site	Destruction of cultural heritage sites and artefacts	Communication with land occupiers and land owners to identify other sites of cultural importance. Identification of such sites as no-go areas	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to sensitive biodiversity areas CBA Irreplaceable)	Avoid prospecting activities in sensitive areas, buffer 30 m.	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to sensitive biodiversity areas (CBA Optimal)	Avoid drilling activities in sensitive areas / Conditions of Authorisation, buffer 30m.	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Damage to wetland / riparian vegetation	Compliance to set buffers / Conditions of authorisation	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Air Quality Impact (Dust)	Dust suppression - dry season	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Vegetation clearance	Disturbance of commercial &	Communication with land	Site supervisor	Performance Assessment &

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
for establishment of trial pits & cutting of vegetation at drill sites	community activities on site	owner. Access agreement conditions		Reporting as stipulated in EA Application for Closure Certificate
Vegetation clearance for establishment of trial pits & cutting of vegetation at drill sites	Storm water run-off from cleared areas could lead to siltation of water courses, farm dams and wetlands	Sediment and erosion controls - e.g. cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Workers & material on site	Contamination of soils through spills from sanitation facilities & litter	Regular maintenance of chemical toilets. Replacement if required. Collection and disposal of waste	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Workers & material on site	Poaching / Killing of snakes & animals	Daily attendance checks and register	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Workers & material on site	Fire	Visual checks to ensure fire breaks is in place and Code of Conduct is adhered to	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Workers & material on site	Collection of fire wood, damage to property	Complaints register & daily attendance register	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Workers & material on site	Contribution to the economy through employment	Contractual agreement	Site supervisor	Invoicing Performance Assessment & Reporting as stipulated in EA
Workers & material on site	Snake bites	Toolbox talks	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Workers & material	Spread of HIV/Aids to local	Toolbox talks	Site supervisor	Performance Assessment &

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
on site	community			Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or trial pit activities	Resource consumption (diesel - non-renewable resource)	Maintenance records	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of soils through hydrocarbon leaks and spills from machinery & equipment	Visual checks at storage and vehicle parking areas. Material Safety Data Sheets	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Use of groundwater for drilling or trial pits activities	No abstraction of water from boreholes / Water bowser	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment	Drip trays, PVC Liners. Material Safety Data Sheets	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling	Contamination of water courses, wetlands and farm dams through hydrocarbon leaks and spills from machinery & equipment	Drip trays, PVC Liners. Material Safety Data Sheets	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Compaction of soils through movement of heavy vehicles and machinery on site	Determination of access routes (drill grid). Rehabilitation of drill sites & access routes	Site supervisor	Performance Assessment & Reporting as stipulated in EA Application for Closure Certificate
Use of heavy machinery & vehicles	Damage to vegetation	Determination of access routes (drill grid). Rehabilitation of drill	Site supervisor	Performance Assessment & Reporting as stipulated in

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
on site for drilling or digging trial pits		sites & access routes		EA Application for Closure Certificate
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to CBA Irreplaceable & Optimal Areas	Avoid prospecting activities in CBA Irreplaceable / Conditions of authorisation, buffer 30 m.	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Damage to riparian and wetland vegetation	Determination of access routes, drill holes and pitting areas in line with buffers. Rehabilitation of drill sites & access routes / DWS Authorisation Conditions	Site supervisor	Performance Assessment & Reporting as stipulated in EA Application for Closure Certificate
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Release of gaseous emissions	Maintenance records	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Air Quality Impact (Dust)	Dust suppression - dry season	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pit activities	Increase in ambient noise levels	Complaints register	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Visual intrusion	Prospecting Work Programme	Site supervisor	Performance Assessment & Reporting as stipulated in EA
Use of heavy	Disturbance of fauna species	Drill equipment - Trial pits	Site supervisor	Performance Assessment &

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
machinery & vehicles on site for drilling or digging trial pits	in the vicinity	limited to 2		Reporting as stipulated in EA Application for Closure Certificate
Use of heavy machinery & vehicles on site for drilling or digging trial pits	Proliferation of invasive plant species	Works Instruction	Site supervisor	Performance Assessment & Reporting as stipulated in EA Application for Closure Certificate
Closure				
Concurrent rehabilitation	Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion	Visual checks to determine level of rehabilitation	Site supervisor	Performance Assessment & Reporting as stipulated in EA Application for Closure Certificate
Concurrent rehabilitation	Use stockpiled top soil to close sumps and trial pits	Visual checks to determine level of rehabilitation	Site supervisor	Performance Assessment & Reporting as stipulated in EA Application for Closure Certificate
Close drill hole	Restoration of land use and land capability	Visual checks to ensure capping of boreholes	Site supervisor	Performance Assessment & Reporting as stipulated in EA Closure Application

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

In terms of regulation 26(e) of the EIA Regulations, 2014 the competent authority must specify the frequency of auditing of compliance with the conditions of the environmental authorisation and of compliance with the EMPr. According to the regulation the frequency of the auditing of compliance with the conditions of the environmental authorisation and of compliance with the EMPr may not exceed intervals of five years. It is recommended that an environmental audit be conducted every two years by an independent external auditor and the results of the audit be provided to the regional manager. The environmental audit report must be compiled in accordance with Appendix 7 of the EIA Regulations, 2014.

m) Environmental Awareness Plan

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

All employees will be required to undergo site induction. Additionally daily toolbox talks will be held each morning before the activities for the day are commenced.

The Site Induction training will focus on the following:

Discussion of environmental impacts as indicated in the Impact Assessment Table (Appendix 5)

(a) Waste management –The removal of all waste from site to prevent litter

(b) Water usage – Conservation of water, correlation between water & erosion.

(c) Driving protocol – Pre-start vehicle checks prior to driving, adhering to speed limits on dirt roads.

(d) Environmental mitigation – Example no collection of wood, no open fires, no snaring of animals, no poaching, no unnecessary destruction of vulnerable natural vegetation, clean-up of hydrocarbon spills, etc.

(e) Emergency procedure – Type of emergencies, type of alarms, emergency equipment, location of assembly point and identification of emergency wardens.

(f) During the daily toolbox talks the following will be discussed:

(g) Any environmental or health and safety incidents that may have occurred the previous day

(h) Status of housekeeping on site

(i) Ad hoc refresher in terms of emergency procedures

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

Please refer to the following:

(a) Appendix 5 for the Impact Table

(b) Table 10 presented above in Part B 1 (d) (iv).

n) Specific information required by the Competent Authority
(Among others, confirm that the financial provision will be reviewed annually).

(a) Prospecting Work Programme

(b) The Financial Provision reviewed on an annual basis

(c) Performance assessment

(d) External Audits

2) UNDERTAKING

The EAP herewith confirms

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

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

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

d) that the information provided by the EAP to interested and affected parties any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein.

(Draft electronic copy)

Signature of the environmental assessment practitioner:

EcoPartners (Pty) Ltd

Name of company:

Date: May 2017

-END-

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