



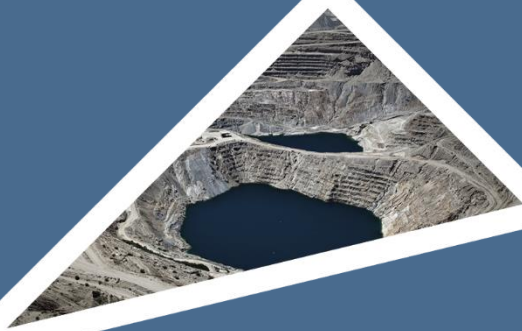
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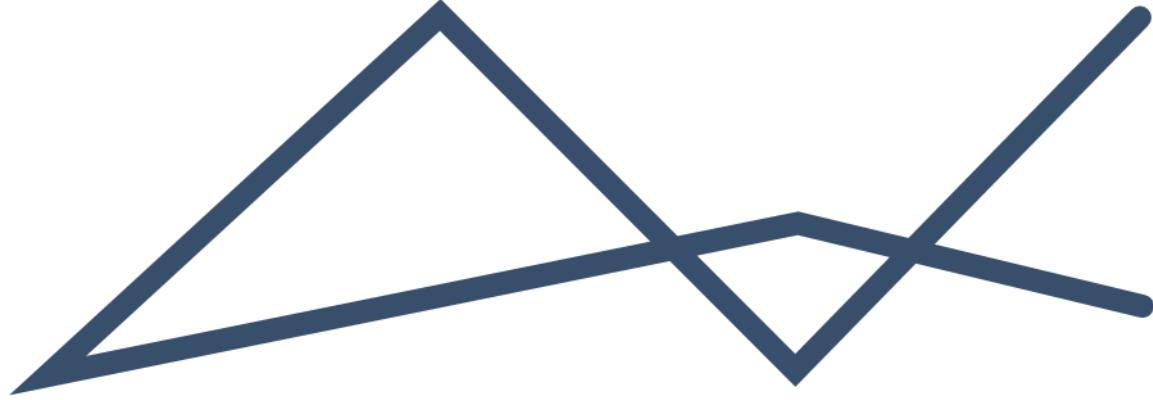
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FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN, INCORPORATING AN ANNUAL REHABILITATION PLAN AND ENVIRONMENTAL RISK ASSESSMENT

NIMBARGO RESOURCES (PTY) LTD: KOOKFONTEIN PROSPECTING RIGHT APPLICATION PROJECT

PR Reference Number: GP30/5/1/1/2 (10652) PR





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1 INTRODUCTION

Nimbargo Resources (Pty) Ltd (the Applicant) has submitted an application for a Prospecting Right (PR) in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and an Application for Environmental Authorization in terms of Chapter 4 of GNR 982 promulgated under the National Environmental Management Act (Act 107 of 1998) (NEMA) to prospect for sand (general), clay (general) and silica sand (general and silica). The DMRE has accepted the PR application on condition the EA application process is concluded.

The proposed project will aim to ascertain if economically viable mineral deposits exist within the application area. In order to undertake prospecting activities, Nimbargo Resources will require a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act (MPRDA, Act No.28 of 2002). The Applicant is also required to obtain an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998) which involves the submission of a Basic Assessment Report (BAR). Environmental Impact Management Services (Pty) Ltd (EIMS) have been appointed by Nimbargo Resources to compile the BAR (this report) in support of the Prospecting Right application, which in turn will be submitted to the DMRE for adjudication.

EIMS has been appointed as the independent consultants to assess the environmental impacts and requirements in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002, MPRDA) and the National Environmental Management Act (Act No.107 of 1998, NEMA). This includes submitting an application for a prospecting right and environmental authorisation as well as preparation of a Basic Assessment Report and EMPR for the proposed prospecting activity to the DMR.

In accordance with Section 24P of the NEMA the Applicant must, before the Minister responsible for mineral resources issues the EA, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts. This Final Rehabilitation, Decommissioning and Closure Plan (FRDCP) aims to meet this requirement and has been prepared in accordance with the requirements of the NEMA Financial Provisioning Regulations (2015) (NEMA GNR 1147).

According to the regulations, financial provision must be made for rehabilitation and remediation; decommissioning and closure activities at the end of prospecting, exploration, mining or production operations; and remediation and management of latent or residual environmental impacts which may become known in the future. In order to address these requirements, this document includes an annual rehabilitation plan, a final rehabilitation, decommissioning and mine closure plan, and an environmental risk assessment report.

Table 1 below lists the specific requirements that must be contained in each of the three plans as per the NEMA GNR 1147 Appendices 3, 4 and 5, as well as the associated section in this report where each requirement is addressed.

Table 1: NEMA GNR 1147 Appendix 3, 4 and 5 Requirements and Associated Sections Where They Are Addressed

No.	Requirement	Relevant Section
Annual Rehabilitation Plan – Appendix 3		
3 (a)	details of the person or persons that prepared the plan, and timeframes of implementation of the current, and review of the previous rehabilitation activities;	Section 2
3 (b)	the pertinent environmental and project context relating directly to the planned annual rehabilitation and remediation activity;	Section 3.1.1
3 (c)	results of monitoring of risks identified in the final rehabilitation, decommissioning and mine closure plan with a view to informing rehabilitation and remediation activities;	To be confirmed after the first implementation of



No.	Requirement	Relevant Section
		the Annual Rehabilitation Plan.
3 (d)	an identification of shortcomings experienced in the preceding 12 months;	Section 4
3 (e)	details of the planned annual rehabilitation and remediation activities or measures for the forthcoming 12 months;	Section 4
3 (f)	a review of the previous year's annual rehabilitation and remediation activities;	Section 4
3 (g)	costing;	Section 4
Final Rehabilitation, Decommissioning and Mine Closure Plan – Appendix 4		
3 (a)	details of the person or persons that prepared the plan;	Section 2
3 (b)	the context of the project, including material information and issues that have guided the development of the plan, an overview of the environmental context, the social context regarding closure activities and post-mining land use, stakeholder issues and comments, and the mine plan and schedule for operations;	Section 3.1
3 (c)	findings of an environmental risk assessment leading to the most appropriate closure strategy;	Section 3.2
3 (d)	design principles, including the legal and governance framework, the closure vision, objectives and targets, alternative closure and post closure options, a motivation for the preferred closure action, details of the closure and post closure period, details associated with any on-going research on closure options, and details of assumptions made to develop closure actions;	Section 3.4
3 (e)	a proposed final post-mining land use;	Section 0
3 (f)	closure actions required;	Section 3.5
3 (g)	a schedule of actions for final rehabilitation, decommissioning and closure;	Section 3.5
3 (h)	an indication of the organisational capacity that will be put in place to implement the plan, including the organisational structure;	Section 3.7
3 (i)	an indication of gaps in the plan;	Section 3.8
3 (j)	relinquishment criteria for each activity or infrastructure in relation to environmental aspects with auditable indicators;	Section 3.9
3 (k)	the closure cost estimation procedure;	Section 3.10
3 (l)	monitoring, auditing and reporting requirements which relate to the risk assessment, legal requirements and knowledge gaps;	Section 3.11
3 (m)	motivations for any amendments made to the final rehabilitation, decommissioning and mine closure plan, given the monitoring results in the previous auditing period and the identification of gaps as per 2(i).	Section 3.11



No.	Requirement	Relevant Section
Environmental Risk Assessment – Appendix 5		
3 (a)	details of the person or persons that prepared the plan;	Section 2
3 (b)	details of the assessment process used to identify and quantify the latent risks;	Section 5.1
3 (c)	management activities;	Section 5.2
3 (d)	costing;	Section 5.2
3 (e)	monitoring, auditing and reporting requirements.	Section 5.2

2 DETAILS OF THE SPECIALIST

The details of the professionals who contributed to the preparation of the annual rehabilitation plan (ARP), final rehabilitation, decommissioning and mine closure plan (FRDCP) and environmental risk assessment (ERA) are provided in Table 2.

Table 2: Details of Specialist¹

Name	Role	Qualifications/ Experience	Professional Registrations
Brian Whitfield	Environmental Scientist / EAP	BSc Honors degree: Botany ~17 years of experience	South African Council for Natural Scientific Professions- Registered Professional Natural Scientist (Environmental Science 400447/13)
Cheyenne Muthukarapan	Environmental Scientist / EAP	BSc. Environmental and Geographical Sciences, ~4 Years' experience	

3 FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN (FRDCP)

According to the NEMA GNR 1147 the objective of the final rehabilitation, decommissioning and closure plan, is to identify a post-prospecting land use that is feasible through-

- 1.1 Providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- 1.2 Outlining the design principles for closure;
- 1.3 Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;

¹ According to the 2015 Financial Provisioning Regulations "Specialist" is defined as "specialist" means an independent person or persons who is qualified by virtue of his or her demonstrable knowledge, qualifications, skills or expertise in the mining, environmental, resource economy and financial fields.



- 1.4 Detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- 1.5 Committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- 1.6 Identifying knowledge gaps and how these will be addressed and filled;
- 1.7 Detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- 1.8 Outlining monitoring, auditing and reporting requirements.

This section of the report aims to achieve these objectives.

3.1 PROJECT AND ENVIRONMENTAL CONTEXT

This section aims to provide context and focus attention on the material information and issues that have guided the development of this FRDCP. Further details on the project and environmental context can be obtained from the Basic Assessment Report.

3.1.1 PROJECT CONTEXT

Please refer to the detailed description of the project as provided for in Section 2 of the BAR. The planned prospecting activities, which would require inclusion in the FRDCP are extracted and described in Section 3.1.1.1 to Section 3.1.1.4.

3.1.1.1 LOCATION

The table below indicates the farm portions that fall within the Prospecting Right/ Environmental Authorisation Application Area.

Table 3: Locality Details

Farm Name (s)	Various portions of the Farms Damfontein; Kookfontein; Smaldeel; Farm Vlakfontein and Waldrift.
Application Area (Ha)	Refer to Table 4 below for a detailed list of properties included in the application area.
Magisterial District	The area is 2949.7522Ha
Distance and direction from nearest town	Sedibeng District Municipality
21-digit Surveyor General Code for each Portion	The area is located approximately 7km north of Vereeniging and 4km southwest from Meyerton, Sedibeng District, Gauteng Province.



Table 4: Properties within the Application Area

Nr.	Registered Land Description	Extent (Ha)	Title Deed/Diagram Deed	SG Code
1	Farm Kookfontein 545 IQ Portion 2	65.9697	T407/1973	T0IQ000000005450002
2	Farm Kookfontein 545 IQ Portion RE of 16	13.3971	T20698/1937	T0IQ000000005450016
3	Farm Kookfontein 545 IQ Portion 22	79.9464	T106019/2008	T0IQ000000005450022
4	Farm Kookfontein 545 IQ Portion 27	14.8849	T20524/1956	T0IQ000000005450027
5	Farm Kookfontein 545 IQ Portion 29	325.1100	T38756/2014	T0IQ000000005450029
6	Farm Kookfontein 545 IQ Portion 30	21.4100	T46345/1964	T0IQ000000005450030
7	Farm Kookfontein 545 IQ Portion 35	0.8800	T31763/1960	T0IQ000000005450035
8	Farm Kookfontein 545 IQ Portion 54			T0IQ000000005450054
9	Farm Kookfontein 545 IQ Portion 55	239.8600	T21553/2014	T0IQ000000005450055
10	Farm Kookfontein 545 IQ Portion 64	32.9150	T4134/1984	T0IQ000000005450064
11	Farm Kookfontein 545 IQ Portion 65	9.2024	T32934/1973	T0IQ000000005450065
12	Farm Kookfontein 545 IQ Portion 66	1.0680	T31527/2013	T0IQ000000005450066
13	Farm Kookfontein 545 IQ Portion 93	75.5238	T21555/2014	T0IQ000000005450093
14	Farm Kookfontein 545 IQ Portion 95	11.4480	T133049/2000	T0IQ000000005450095
15	Farm Kookfontein 545 IQ Portion RE of 97	30.1766	T106019/2008	T0IQ000000005450097



16	Farm Kookfontein 545 IQ Portion 98			T0IQ0000000054500098
17	Farm Kookfontein 545 IQ Portion 99	306.8451	T7728/2004	T0IQ0000000054500099
18	Farm Kookfontein 545 IQ Portion RE of 100	29.4237	T27726/2004	T0IQ00000000545000100
19	Farm Kookfontein 545 IQ Portion RE of 102	246.0913	T148120/2007	T0IQ00000000545000102
20	Farm Kookfontein 545 IQ Portion 105			T0IQ00000000545000105
21	Farm Kookfontein 545 IQ Portion 106			T0IQ00000000545000106
22	Farm Kookfontein 545 IQ Portion 108			T0IQ00000000545000108
23	Farm Kookfontein 545 IQ Portion 109			T0IQ00000000545000109
24	Farm Damfontein 541 IQ Portion 1	685.2300		T0IQ0000000054100001
25	Farm Damfontein 541 IQ Portion 2	94.6300	T34205/2014	T0IQ0000000054100002
26	Farm Damfontein 541 IQ Portion 36	68.9000	T121970/2006	T0IQ0000000054100036
27	Farm Damfontein 541 IQ Portion 37	39.6300	T121970/2006	T0IQ0000000054100037
28	Farm Smaldeel 542 IQ Portion 4	60.1600	T19577/2008	T0IQ0000000054200004
29	Farm Waldrift 599 IQ Portion 16	10.7336	T6244/2010	T0IQ0000000059900016
30	Farm Waldrift 599 IQ Portion 89	64.8284	T133050/2000	T0IQ0000000059900089
31	Farm Vlakfontein 546 IQ Portion 7	26.9547	T132692/1999	T0IQ0000000054600007
32	Farm Vlakfontein 546 IQ Portion 111	8.5700	T1269/1978	T0IQ0000000054600111
33	Farm Vlakfontein 546 IQ Portion 114	8.5653	T36908/2006	T0IQ0000000054600114



34	Farm Vlakfontein 546 IQ Portion 115	8.5653	T36908/2006	T0IQ0000000054600115
35	Farm Vlakfontein 546 IQ Portion 118	8.5653	T41994/2006	T0IQ0000000054600118
36	Farm Vlakfontein 546 IQ Portion 119	8.5653	T33765/2015	T0IQ0000000054600119
37	Farm Vlakfontein 546 IQ Portion 125	8.5653	T55067/2005	T0IQ0000000054600125
38	Farm Vlakfontein 546 IQ Portion 144	8.5653	T44945/2005	T0IQ0000000054600144
39	Farm Vlakfontein 546 IQ Portion 151	8.5653	T81463/1997	T0IQ0000000054600151
40	Farm Vlakfontein 546 IQ Portion 152	8.5653	T44945/2005	T0IQ0000000054600152
41	Farm Vlakfontein 546 IQ Portion 153	8.5653	T44945/2005	T0IQ0000000054600153
42	Farm Vlakfontein 546 IQ Portion 154	8.5653	T5978/1979	T0IQ0000000054600154
43	Farm Vlakfontein 546 IQ Portion 159	37.4252	T51311/2001	T0IQ0000000054600159
44	Farm Vlakfontein 546 IQ Portion 167	66.0962	T132692/1999	T0IQ0000000054600167
45	Farm Vlakfontein 546 IQ Portion 173	43.5399	T121981/2004	T0IQ0000000054600173
46	Farm Vlakfontein 546 IQ Portion 175	12.5335	T71399/2003	T0IQ0000000054600175
47	Farm Vlakfontein 546 IQ Portion 194	8.8544	T132692/1999	T0IQ0000000054600194
48	Farm Vlakfontein 546 IQ Portion 195	13.8426	T132692/1999	T0IQ0000000054600195
49	Farm Vlakfontein 546 IQ Portion 197	65.6097	T13816/1984	T0IQ0000000054600197
50	Farm Vlakfontein 546 IQ Portion 198	52.4090	T17085/2005	T0IQ0000000054600198
	TOTAL AREA (HA)	2949.7522		

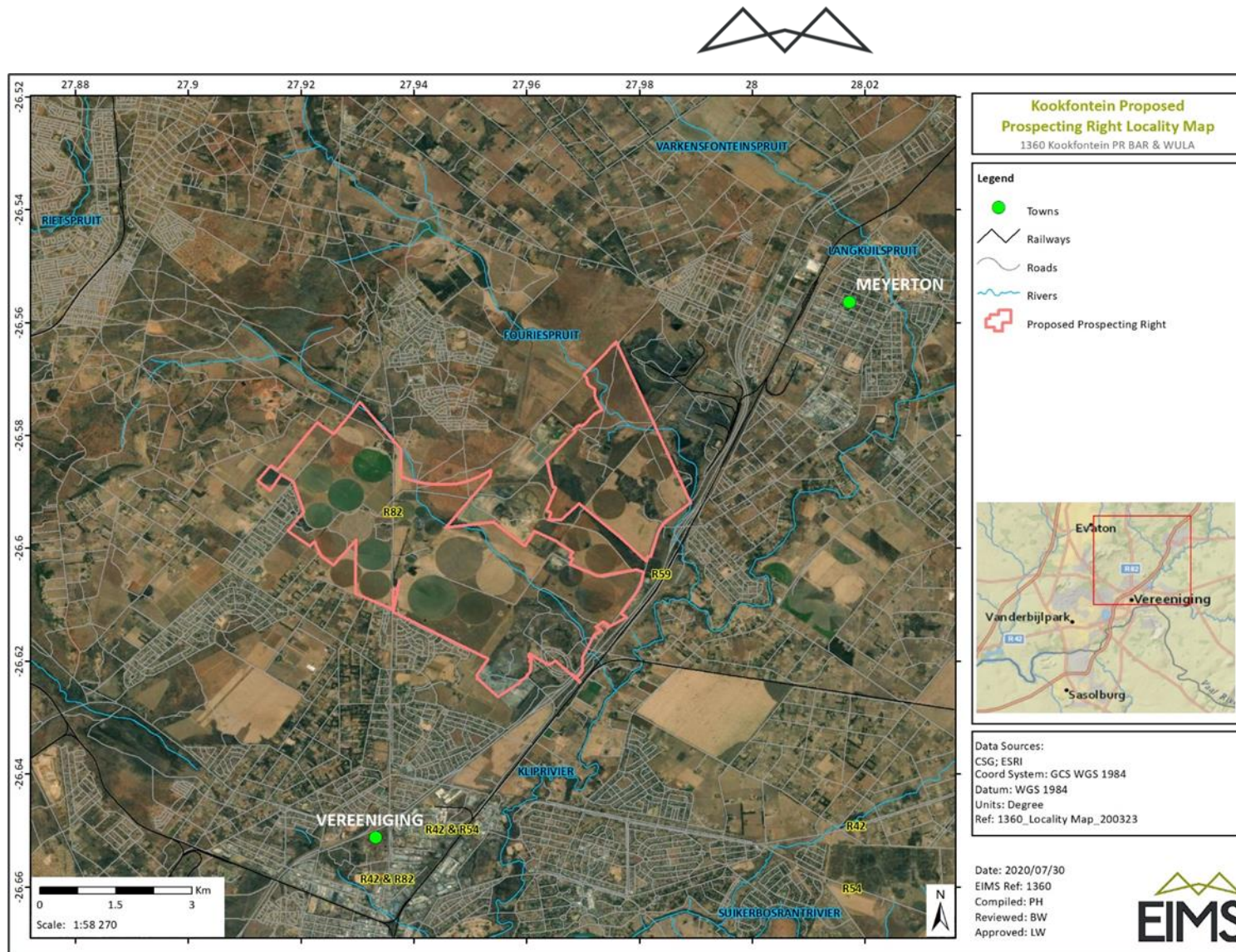


Figure 1: Locality Map



3.1.1.2 DESCRIPTION OF PROPOSED ACTIVITIES

Both non-invasive and invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme (PWP). The application will follow a phased approach, where the prospecting work program is divided into several sequential phases.

Figure 1 above depicts the proposed prospecting area, the proposed areas of interest within the application area will be defined within the course of prospecting activities. It is anticipated that the invasive program will consist of 58 boreholes with a footprint of approximately 400 m² each. Vegetation will be cleared at the borehole locations within the application area. Existing roads will be used to access the proposed borehole sites as far as possible. Temporary access roads if required will not exceed 3.5m in width.

At the end of each phase there will be a brief period of compiling and evaluating results. The results will not only determine whether prospecting proceeds, but also the manner in which it will go forward. The applicant will only action the next phase of prospecting, once satisfied with the results obtained in the previous phases. In addition, smaller, non-core parts of the prospecting work program will be undertaken, if warranted. A description of the planned invasive and non-invasive activities is detailed below:

1. Description of planned non-invasive activities (Phase 1): These activities do not disturb the land where prospecting will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc.
 - Desktop studies
 - Accessing all available public information on the geology, mineral occurrence and topography;
 - Accessing all information on past work carried out in the area from geophysics, geochemistry, image interpretation, drilling and mining;
 - Any information accessed will be reviewed, collated and achieved for reference.
 - Spatial Database Compilation
 - Compilation of spatial information into a GIS database for access, correlation and evaluation.
 - The GIS system will be used and maintained for the period of prospecting right exploration programme and regularly updated as new information is generated by the exploration programme.
 - Land Survey: All spatial information accessed and collected in the field will be standardised using the WGS84 datum.
 - Remote sensing
 - As part of the initial review, public domain aerial photos will be acquired and a detailed geological and structural interpretation will be done on these to aid in identifying target areas that are not readily evident on the ground and to provide an independent interpretation of the geology of the area.
 - Satellite imagery will also be acquired to provide a more regional viewpoint of the area of interest. As before a detailed geological and structural interpretation will be done on these images to provide a more regional viewpoint on the target areas. Satellite imagery is used to complement the aerial photos interpretations as the combination of multi-spectral bands can be used to highlight certain lithology's, vegetation types, soil types, alteration minerals, etc.
 - Geophysical Survey to be undertaken
 - Both airborne and ground geophysical surveys may be undertaken for the prospecting right area. This is dependent on the results of the desktop study. These surveys will be used in conjunction with the data available to the public from the Council for Geoscience.



- A small airborne magnetic/radiometric survey using drone technology may be carried out over the proposed prospecting area to map the structural geology of the area.
- Follow up ground geophysical surveys will be carried out on coincident targets from the compilation of geological and geophysical data. These surveys may include ground gravity, ground electromagnetics, IP and controlled source audio magnetotellurics (CSAMT).

2. **Description of planned invasive activities (Phase 2):** The proposed project will include drilling activities which result in land disturbances. Details of the drilling is provided in the section below:

Drilling: It is not possible at this stage to locate exactly where drilling will be carried out as this will be determined by the results of geophysical and geological work carried out in Phase 1 of the prospecting programme. In order to limit amendments of the PWP & EMP on the location of drill holes, it will be assumed that a drill hole as per Figure 2 below will be located in intervals of 500 meters (indicated resource as per SAMREC code) with no more than 2 holes being actively drilled at any given time. The initial holes will be drilled on the prospecting area that forms part of this application. A maximum amount of 71 holes will be drilled. As stated in the PWP, environmental sensitivity was not taken into account for the proposed drill sites identified in Figure 2.

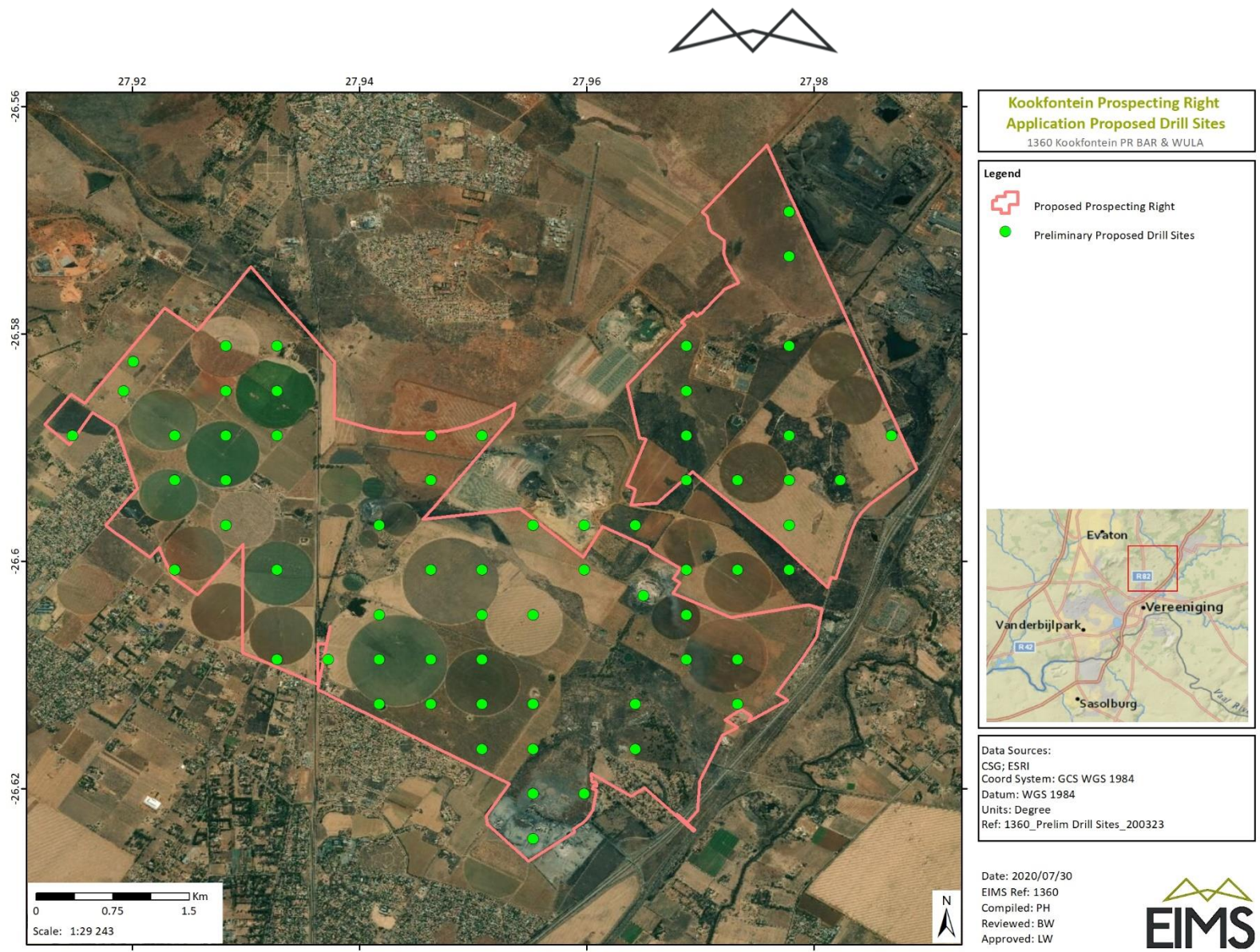


Figure 2: Preliminary Dill sites



3. **Description of pre-feasibility studies (Phase 3):** Following the invasive prospecting activities and laboratory analysis the following activities will be covered during the pre-feasibility study:

- Geological Modelling with suitable software to generate contour plans of all quality parameters as well as the depth and thickness of the ore body;
- Initial mining method evaluation with a superficial cost study and financial model;
- A preliminary marketing study to determine the pricing and demand for the product; and
- A funding plan.

3.1.1.3 SUMMARY OF PROPOSED ACTIVITIES AND ASSOCIATED TIMEFRAMES

Table 5 below provides a summary of the proposed phases, associated activities and time frames for the duration of the PWP.

Table 5: Timeframes each of the proposed activities

Phase	Activity	Year 1	Year 2	Year 3
Phase 1 (Month 0-12)	Non-Invasive Prospecting Geophysical Survey, Field surveys, Literature Studies, Obtaining historical borehole and trenching data and resource information	X		
Phase 2 (Month 12-24)	Invasive Prospecting Infill Drilling and Lab Analysis of cores/samples.		X	
Phase 3 (Month 24-36)	Non-Invasive Prospecting Analytical Desktop and Feasibility Studies			X

3.1.1.4 LISTED AND SPECIFIED ACTIVITIES

Name of Activity	Details of Activity	Aerial extent of the Activity	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
Activities directly related to prospecting of a mineral resource, including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and	Prospecting Activities, including: <ul style="list-style-type: none"> • Drilling • Drill site establishment • hydrocarbon storage 	2949.7522Ha	X	GNR 983 Activity 20	N/A



Name of Activity	Details of Activity	Aerial extent of the Activity	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks.					
Prospecting Activities		2.84Ha	X	GNR 983 Listing 20 (as amended 2017)	N/A
Including:					
Drill site establishment		A drill site of approximately 40m ² will be established that will require: <ul style="list-style-type: none"> • Clearing of vegetation for sumps and the drill entrance point • Earth sumps for water recycling • Laydown for drill rods, fuel and chemical storage and chemical toilets 	X	GNR 983 Activity 20 (as amended 2017)	N/A
Borehole Drilling (up to 20m deep)		1m ²			N/A
The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation		1-20 Ha	X	GNR985 Activity 27 (as amended 2017)	N/A
The clearance of an area of 300 square meters or more of		300m ²	X	GNR985	



Name of Activity	Details of Activity	Aerial extent of the Activity	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.				Activity 12 (as amended 2017)	
Temporary Access Road (if required). Not exceeding 3.5m in width.		Plan to use existing access roads as far as possible.			
Temporary 'Camp site', core / equipment store and site office. Staff will be accommodated off site unless permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established.		0.05 Ha			
Hydrocarbon Storage		Drill site establishments may result in small volumes of hydrocarbons being stored on site including: <ul style="list-style-type: none"> • Diesel • Drill Rod / Machine lubricants It is not expected that the volume of hydrocarbons stored on site will exceed 80m ³ . This activity is	X	GNR 983 Activity 20 (as amended 2017)	



Name of Activity	Details of Activity	Aerial extent of the Activity	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
		therefore considered as part of drill site establishment.			

3.1.2 ENVIRONMENTAL AND SOCIAL CONTEXT

The description and definition of the pre-prospecting environmental context is critical to ensure that the ultimate closure objectives and associated end land-use are achieved. In this regard please refer to Section 6 of the BAR for a detailed description of the receiving environment applicable to this specific project. Based on the description of the receiving environmental and social context, this FRDCP is based on the understanding that no prospecting activities will be undertaken within the following constraint areas:

- Watercourses and Wetlands;
- Heritage sites or features;
- Existing servitudes for powerlines; and
- Residential Areas.

The description of the baseline environment (on site and surrounding) was obtained from the studies undertaken by the specialist team and in conjunction with EIMS. All specialist studies undertaken for the proposed project are included as supporting technical appendices to the BAR. The key environmental aspects related to the application area are summarised in the remainder of this Section.

3.1.2.1 TOPOGRAPHY

The prospecting area covers various farm portions, over an area of approximately 2949.7522 Ha. Topographically, the prospecting area ranges in altitudes from approximately 1454m amsl to 1525m amsl. This is predominantly due to existing mining operations in the area. The area is also characterised by extensive agricultural areas from the west to east. As can be seen in Figure 3, the average elevation from the most northern point to the most south point of the project area is approximately 1477 m amsl and the average slope is 3.3%. Figure 4 shows that the average elevation from the most western point to the most eastern point of the project area is 1483m amsl and the average slope is 1%.

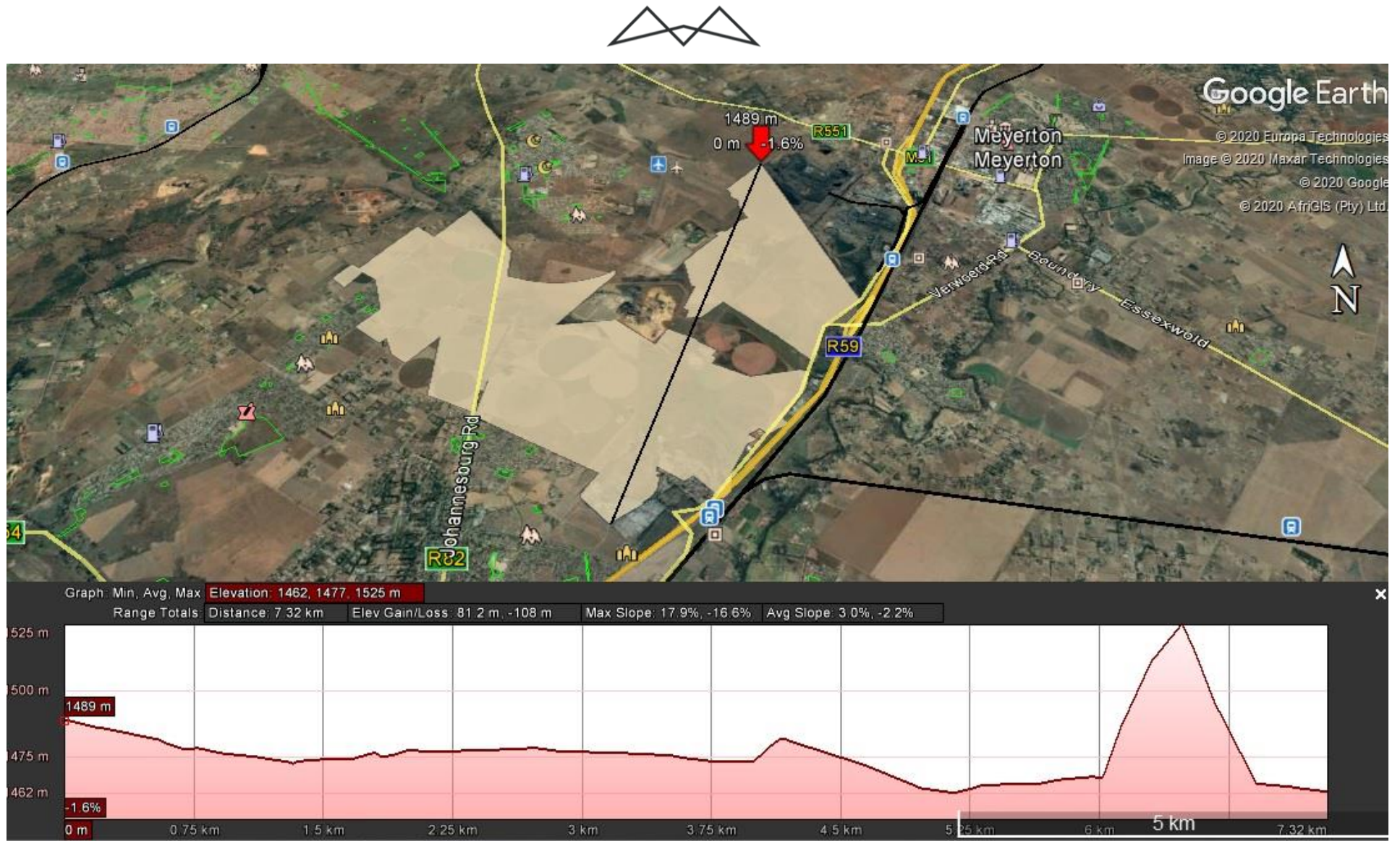


Figure 3: Elevation profile of the proposed prospecting area (north to south)

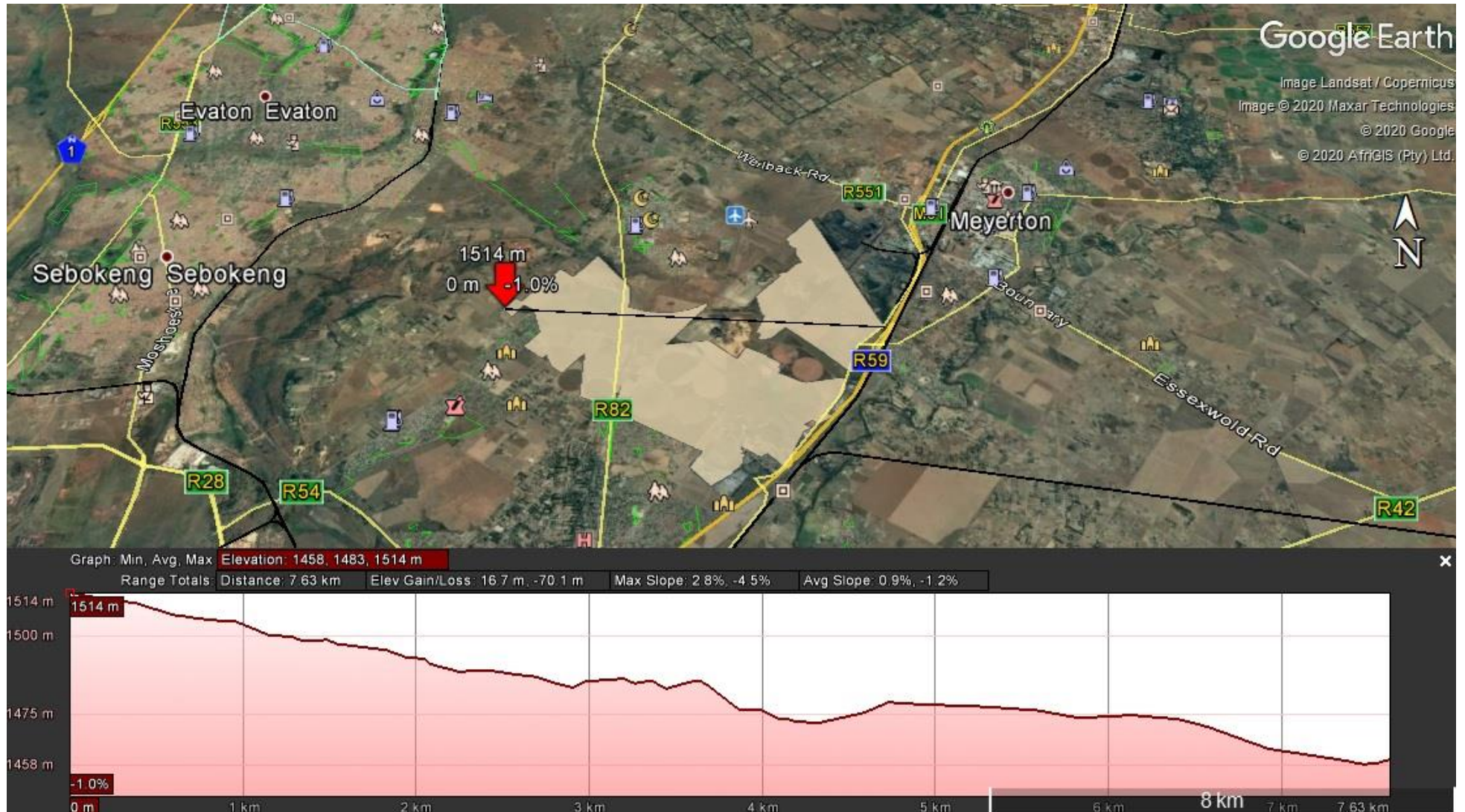


Figure 4: Elevation profile of the proposed prospecting area (west to east)



3.1.2.2 CLIMATE

The climate is warm and temperate in Vereeniging. In winter, there is much less rainfall in Vereeniging than in summer. This location is classified as Cwb by Köppen and Geiger. The average annual temperature is 16.5 °C. annual rainfall is approximately 659 mm per year. The least amount of rainfall occurs in August with an average of approximately 6 mm. In January, the precipitation reaches its peak, with an average of 110 mm. The temperatures are highest on average in January, at around 21.7°C. At 9.0°C on average, July is the coldest month of the year. (en.climate-data.org, 2020)

3.1.2.3 GEOLOGY AND SOILS

The geology of the proposed Kookfontein study area is primarily underlain by the Vryheid Formation (Ecca Group, Undifferentiated Karoo), Precambrian dolomites and associated marine sedimentary rocks that are allocated to the Malmani Subgroup (Chuniespoort Group, Transvaal Supergroup), as well as Quaternary superficial deposits. According to the PalaeoMap on the SAHRIS database, the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Undifferentiated Karoo) is Very High, while that of the Malmani Subgroup and Quaternary deposits are both High (Almond and Pether 2008, SAHRIS website). Groenewald and Groenewald (2014) allocated a High Sensitivity to the Malmani Subgroup as they noted that, in addition to the stromatolites, potentially fossiliferous Late Caenozoic Cave breccias within the “Transvaal dolomite” outcrop area could be present. These breccias are not individually mapped on geological maps (Butler, 2020).

Soil sampling during the site visit revealed mainly dark orthic topsoils underlain by a G-horizon which were classified as a Katspruit soil form, although some areas contained a more gritty, sandy substrate which was classified as a Kroonstad soil form. Descriptions of these dominant soil forms are shown in Figure 6.

3.1.2.4 HYDROGEOLOGY

No detailed hydrogeology study has been undertaken as part of this application due to the low impact the proposed prospecting drilling (20m deep) will have on the groundwater. No abstraction of groundwater is included in this application and no pollution of the groundwater is foreseen due to the prospecting activities.

3.1.2.5 LAND COVER

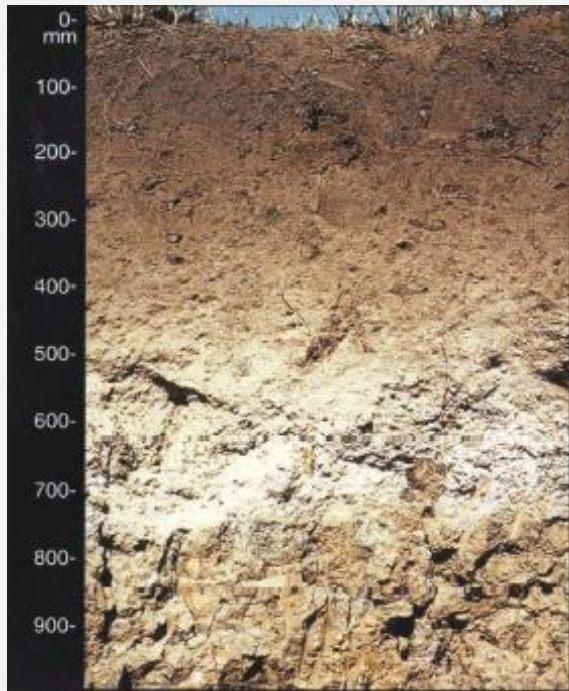
As illustrated in Figure 7, the application area is mostly cultivated land with areas of grassland, forested land, wetlands and mines and quarries. Patches of mines and quarry areas can be found on the northern and central portion of the application area. Grassland is present in patches across the Kookfontein project area, predominately in the northern and southern area.



Figure 5: Geology of the application area

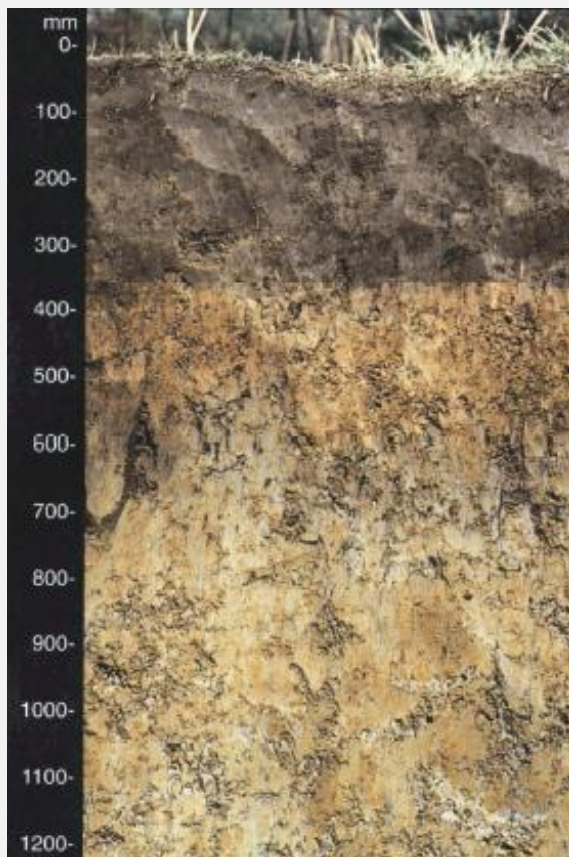


Kroonstad



The terrain was mid-slope to channel. Saturation was typically permanent to seasonal. The soil shows an orthic A horizon over an E over a G horizon. The G-horizon acts as a plug with virtually no permeability and as a result water moves laterally downslope leaching the E-horizon.

Katspruit:



Widespread associated with a number of permanent zones. Permanent. Orthic over G horizon. In the Katspruit soil form an orthic A horizon overlies a G horizon which is typical moist with grey matrix colours. Mottling may or may not occur down to a depth of 50 cm. Many of the Katspruit soils associated with the valley bottom systems in the area are not characteristically saturated at depth. This is largely the result of incision of the stream channel, which serves to drain these areas. The soil profile thus dries out.

Figure 6: Cross section of soil profiles of the proposed prospecting area (SASA, 1999)

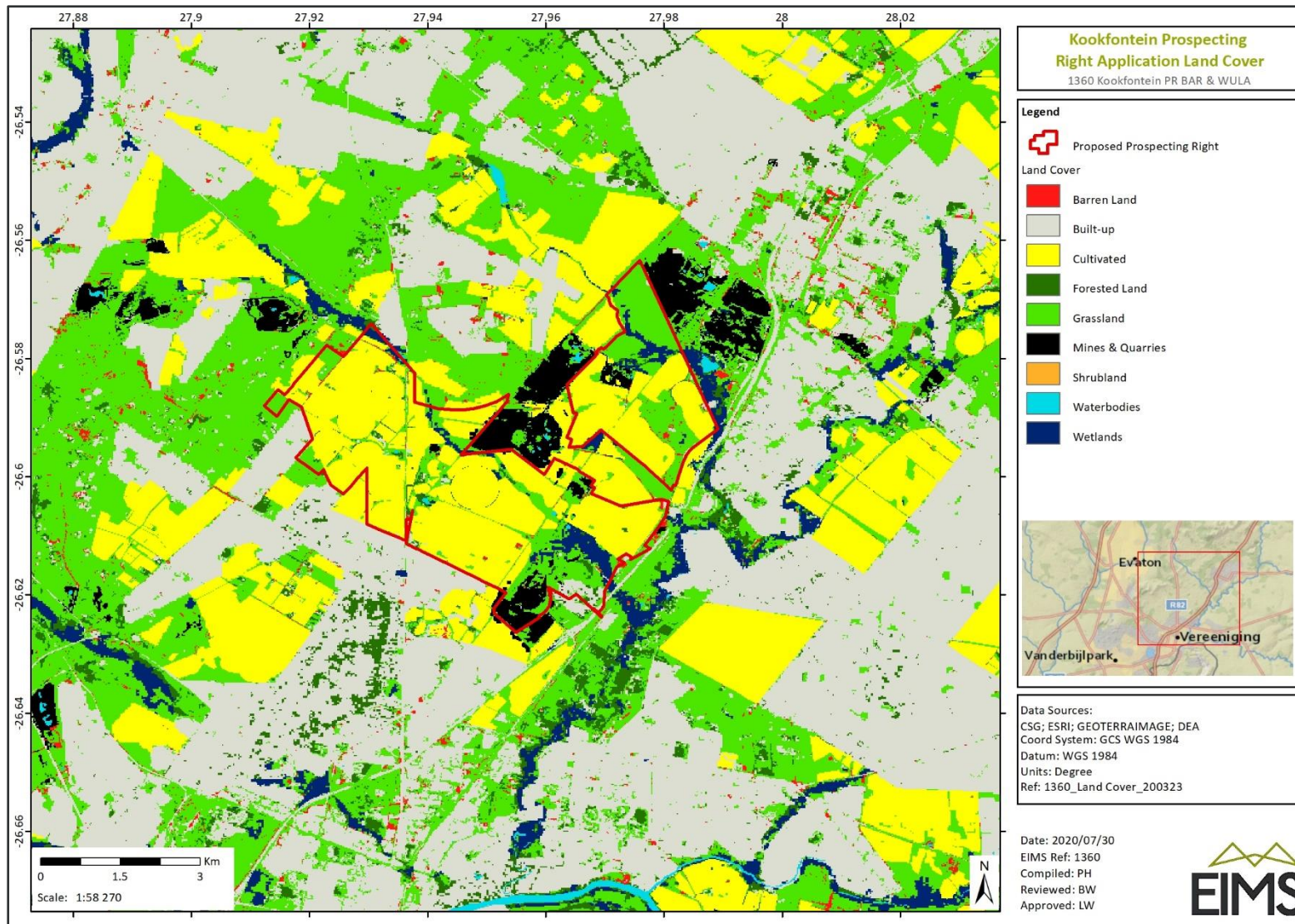


Figure 7: Land Cover



3.1.2.6 ECOSYSTEM PROTECTION LEVEL AND THREAT STATUS

The Soweto Highveld Grassland vegetation type is found in Mpumalanga, Gauteng and to a little extent also in neighbouring Free State and North-West Provinces. This vegetation type typically comprises of an undulating landscape on the Highveld plateau supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. Scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover (Mucina & Rutherford, 2006).

Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno et al., 2019).

According to Mucina and Rutherford (2006), the Soweto Highveld Grassland vegetation type is classified as Endangered (EN). The national target for conservation protection for this vegetation type is 24% (Figure 8), but only a few areas are statutorily conserved (52.7%) in Waldrift, Krugersdorp, Leeuwkuil, Suikerbosrand, Rolfe's Pan Nature Reserves or privately conserved in Johanna Jacobs, Tweefontein, Gert Jacobs, Nikolaas and Avalon Nature Reserves and the Heidelberg Natural Heritage Site.

The proposed prospecting area was superimposed on the ecosystem protection level map for this type of vegetation to assess the protection status of terrestrial ecosystems associated with the development (Figure 9). Based on Figure 9 the terrestrial ecosystems associated with the proposed prospecting area are rated as not protected for the entire project area. This means that these ecosystems are considered not to be adequately protected in areas such as national parks or other formally protected areas.

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Skowno et al., 2019). Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Skowno et al., 2019).

The project area was superimposed on the terrestrial ecosystem threat status. As seen in the figures below, the project area is situated within an ecosystem that are listed as VU.

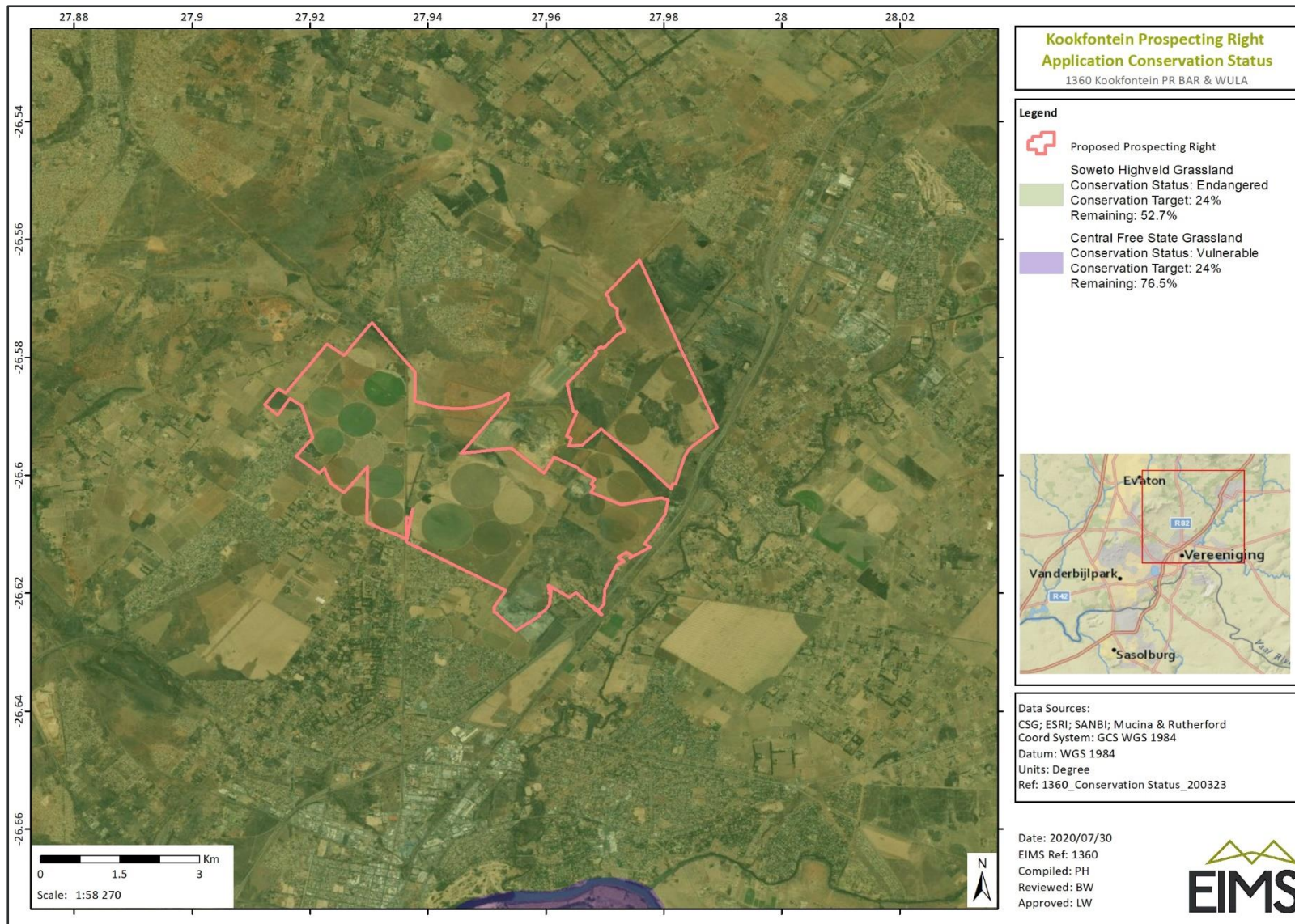


Figure 8: Conservation Status in terms of Vegetation type (Mucina and Rutherford; 2006)

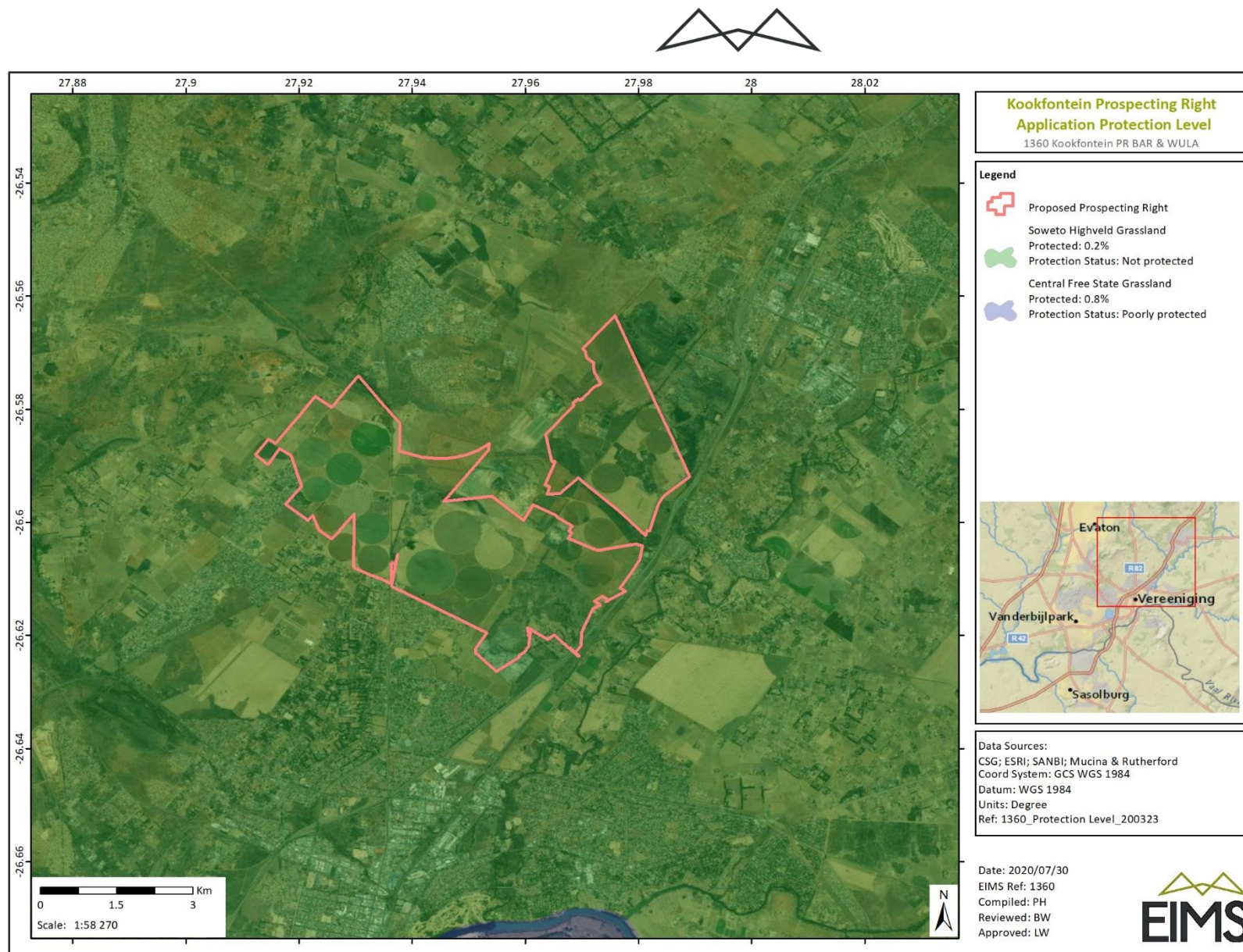


Figure 9: Ecosystem Protection Level in terms of Vegetation type (Mucina and Rutherford; 2006)



Figure 10: The project area showing the regional ecosystem threat status of the associated terrestrial ecosystems (NBA, 2018).



3.1.2.7 RAMSAR SITES & WORLD HERITAGE SITES

There are no Ramsar sites or World heritage sites within the application area.

3.1.2.8 TERRESTRIAL ECOSYSTEMS

The project area is situated within the grassland biome. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). The grassland biome comprises many different vegetation types. The project area is situated within the Soweto Highveld Grassland vegetation type according to Mucina & Rutherford (Figure 11). Based on the Plants of Southern Africa (BODATSA-POSA, 2019) database, 361 plant species have the potential to occur in the project area and its surroundings. Of the 361-plant species, two (2) species is listed as being species of conservation concern (SCC). This species is *Gnaphalium nelsonii* and *Lithops lesliei* subsp. *lesliei*. They are described in Section 9.7 of the Ecological Specialist Report (Appendix E: Specialist Reports).

Table 6: Plant Species of Conservation Concern expected to occur in the prospecting area (BODATSA-POSA, 2016)

Family	Taxon	Author	IUCN	Ecology	Habitat
Asteraceae	<i>Gnaphalium nelsonii</i>	Burt Davy	NT	Indigenous; Endemic	Seasonally wet places in grassland and savanna, and along dry watercourses.
Aizoaceae	<i>Lithops lesliei</i> subsp. <i>lesliei</i>	(N.E.Br.) N.E.Br.	NT	Indigenous	Primarily in arid grasslands, usually in rocky places, growing under the protection of forbs and grasses

3.1.2.9 GAUTENG CONSERVATION PLAN (CRITICAL BIODIVERSITY AREAS (CBAS))

The Gauteng Conservation Plan (Version 3.3) (GDARD, 2014b) classified areas within the province on the basis of its contribution to reach the conservation targets within the province. These areas are classified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to ensure sustainability in the long term. The CBAs are classified as either 'Irreplaceable' (must be conserved), or 'Important'.

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met.

The project area falls across both a CBA: Important and an ESA classified area (Figure 12). Sections of the project area is still unclassified.

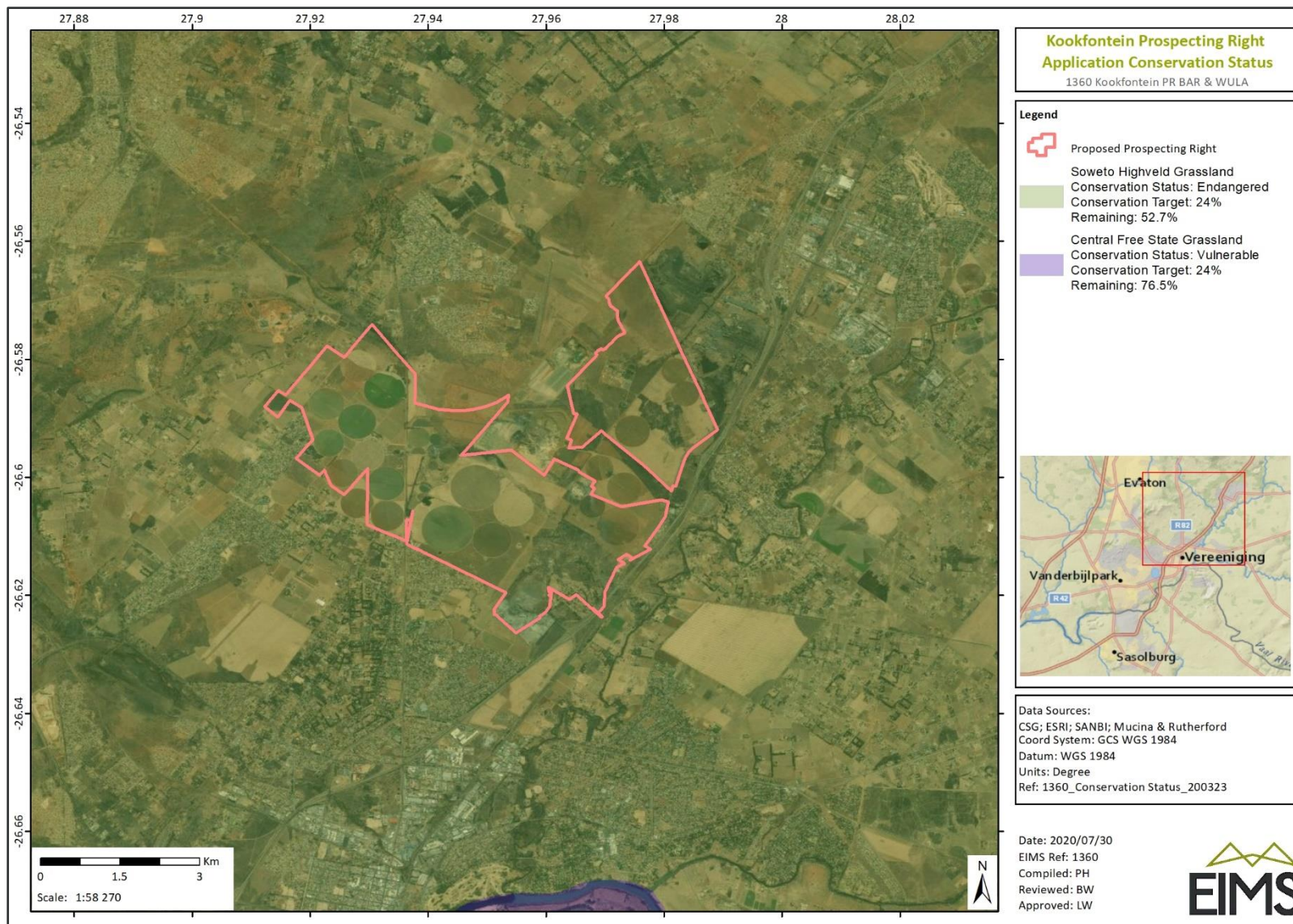


Figure 11: Vegetation types based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2018)

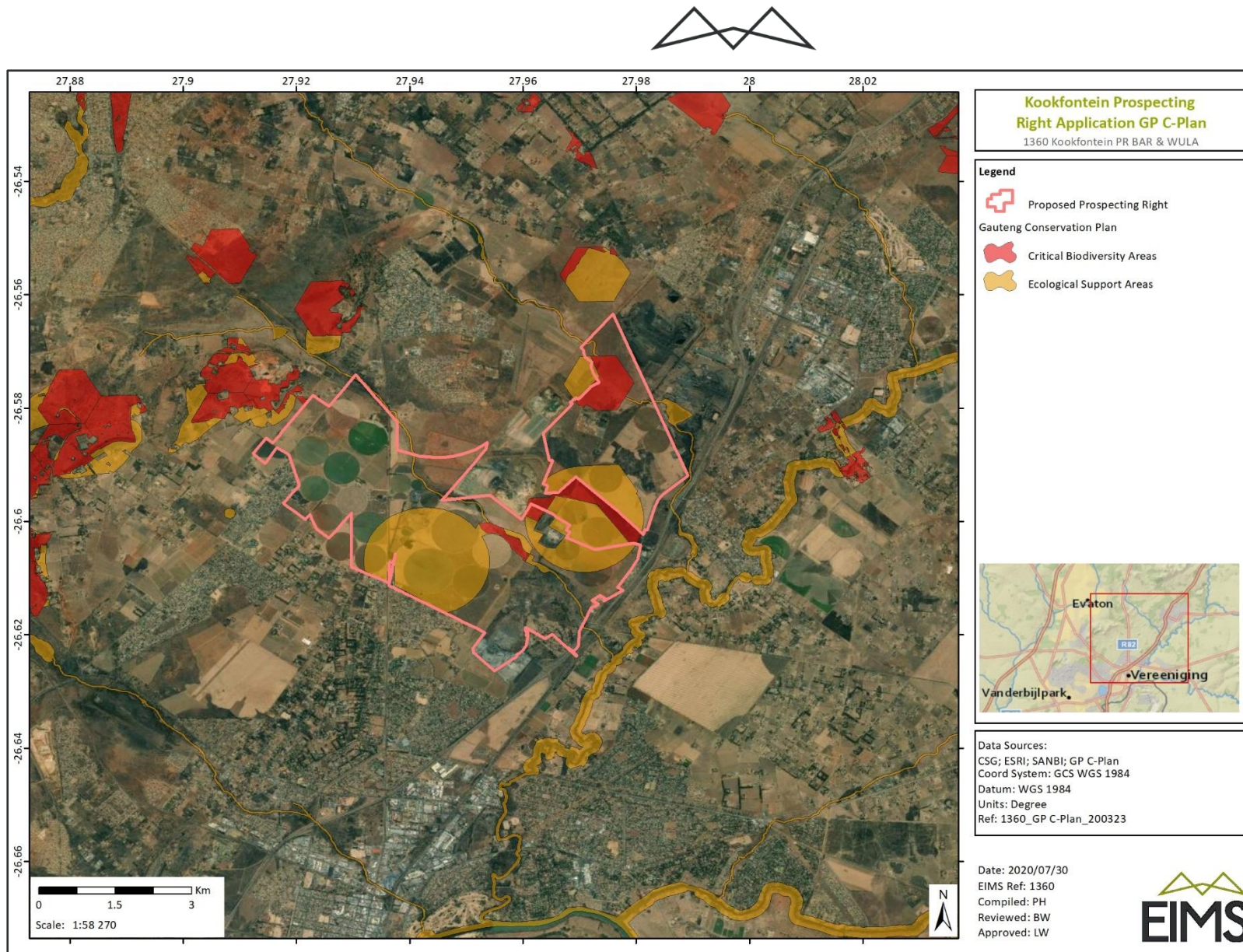


Figure 12: Critical Biodiversity Areas within the proposed project area



3.1.2.10 MINING AND BIODIVERSITY GUIDELINES

The Mining and Biodiversity Guidelines (2013) was developed by the Department of Mineral Resources, the Chamber of Mines, the South African National Biodiversity Institute and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth and environmental sustainability. The Guideline is envisioned as a tool to “foster a strong relationship between biodiversity and mining which will eventually translate into best practice within the mining sector. In identifying biodiversity priority areas which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service point of view as well as the implications for mining in these areas:

- A. Legally protected areas, where mining is prohibited;
- B. Areas of highest biodiversity importance, which are at the highest risk for mining;
- C. Areas of high biodiversity importance, which are at a high risk for mining; and
- D. Areas of moderate biodiversity importance, which are at a moderate risk for mining. Table 7 shows the four different categories and the implications for mining within each of these categories.

The Guideline provides a tool 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. It 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.

Overall, proponents of a mining activity in biodiversity priority areas should demonstrate that:

- There is significant cause to undertake mining – by commenting on whether the biodiversity priority area coincides with mineral or petroleum reserves that are strategically in the national interest to exploit. Reference should also be made to whether alternative deposits or reserves exist that could be exploited in areas that are not biodiversity priority areas or are less environmentally sensitive areas;
- Through the process of a rigorous EIA and associated specialist biodiversity studies the impacts of the proposed mining are properly assessed following good practice. It is critical that sufficient time and resources are budgeted to do so early in the planning and impact assessment process, including appointing appropriate team of people with the relevant skills and knowledge as required by legislation;
- Cumulative impacts have been considered;
- The mitigation hierarchy has been systematically applied and alternatives have been rigorously considered;
- The issues related to biodiversity priority areas have been incorporated into a robust EMP as the main tool for describing how the mining or prospecting operation’s environmental impacts are to be mitigated and managed; and
- Good practice environmental management is followed, monitoring and compliance enforcement is ensured.



Table 7: The mining and biodiversity guidelines categories

Category	Biodiversity priority areas	Risk for mining	Implications for mining
A. Legally protected	Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002)	Mining prohibited	Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it. In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.
B. Highest biodiversity importance	Critically endangered and endangered ecosystems Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs Ramsar Sites	Highest risk for mining	Environmental screening, environmental impact assessment (EIA) and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licenses, and environmental authorisations. If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being. An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into license agreements and/or authorisations.
C. High biodiversity importance	Protected area buffers (including buffers around National Parks, World	High risk for mining	These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem



	<p>Heritage Sites* and Nature Reserves)</p> <p>Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas)</p> <p>Other identified priorities from provincial spatial biodiversity plans</p> <p>High water yield areas</p> <p>Coastal Protection Zone</p> <p>Estuarine functional zone</p>		<p>services for particular communities or the country as a whole.</p> <p>An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and limitations for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>
<p>D. Moderate biodiversity importance</p>	<p>Ecological support areas</p> <p>Vulnerable ecosystems</p> <p>Focus areas for protected area expansion (land-based and offshore protection)</p>	<p>Moderate risk for mining</p>	<p>These areas are of moderate biodiversity value.</p> <p>EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>

Portions in the north and central part of the project area is classified as “highest biodiversity importance” with their associated highest risks for mining. The central part of the project area is classified as “moderate biodiversity importance” with its associated moderate risk for mining

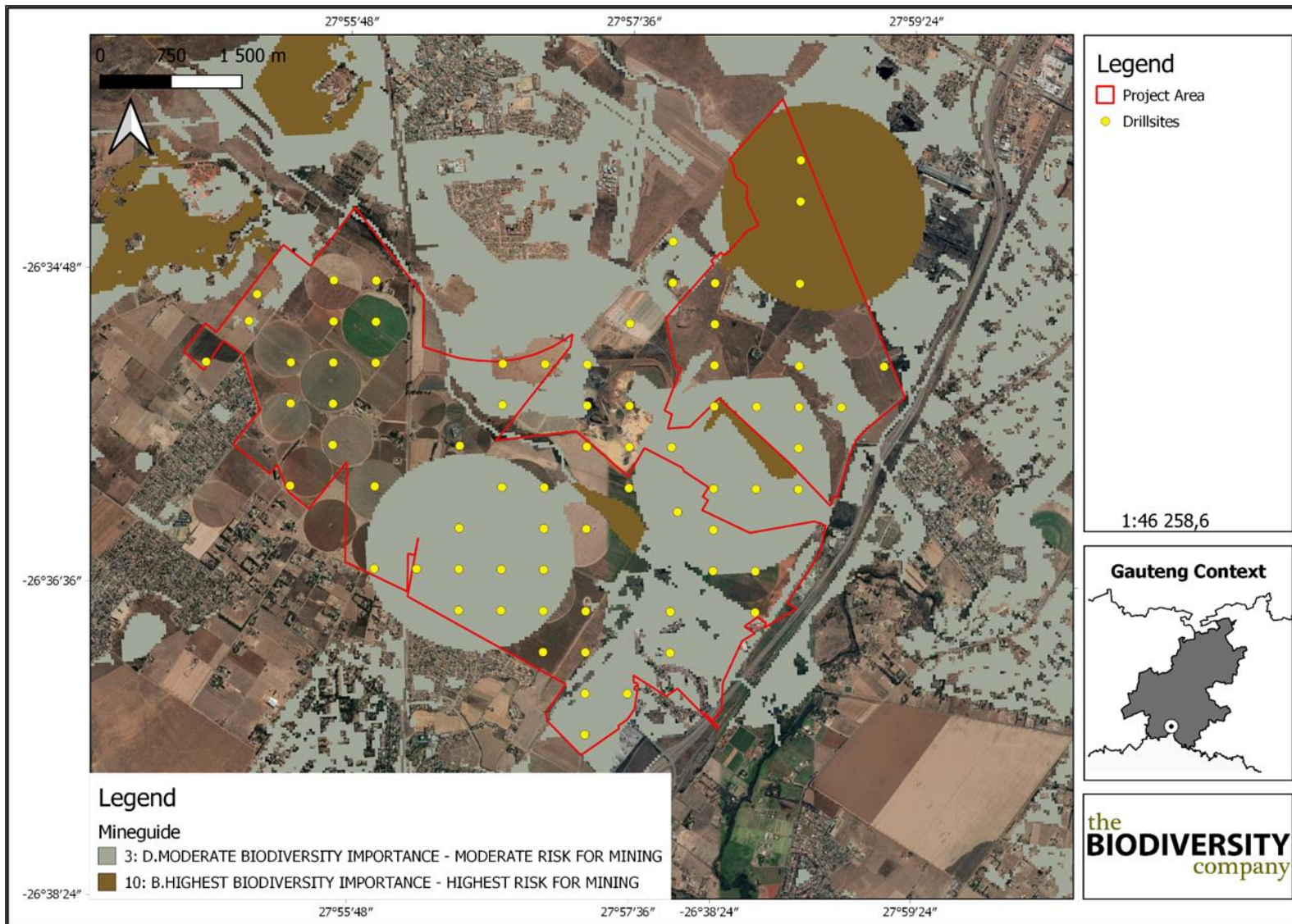


Figure 13: The project area superimposed on the Mining and Biodiversity Guideline spatial dataset (2013)



3.1.2.11 VEGETATION ASSESSMENT

The vegetation assessment was conducted throughout the extent of the project area. A total of 107 tree, shrub and herbaceous plant species were recorded in the project area during the field assessment. Some of the plant species recorded can be seen in Figure 14.



Figure 14: Some of the flora species recorded in the project area: A) *Selago densiflora*, B) *Boophone disticha*, C) *Cleome maculata*, D) *Ledebouria revoluta*, E) *Hypoxis iridifolia*, and F) *Helichrysum inornatum*

3.1.2.11.1 PROTECTED PLANT SPECIES

Several individuals of three protected plant species within Gauteng (*Boophone disticha*, *Crinum bulbispermum* and *Hypoxis hemerocallidea*) were observed and marked during the field survey, and their locations mapped can be seen in Figure 15. These plants are protected due to them being collected for their medicinal values and has led to a decrease in their numbers. Protected plant species can either be relocated in situ (preferred option) or a permit to destroy can be obtained.

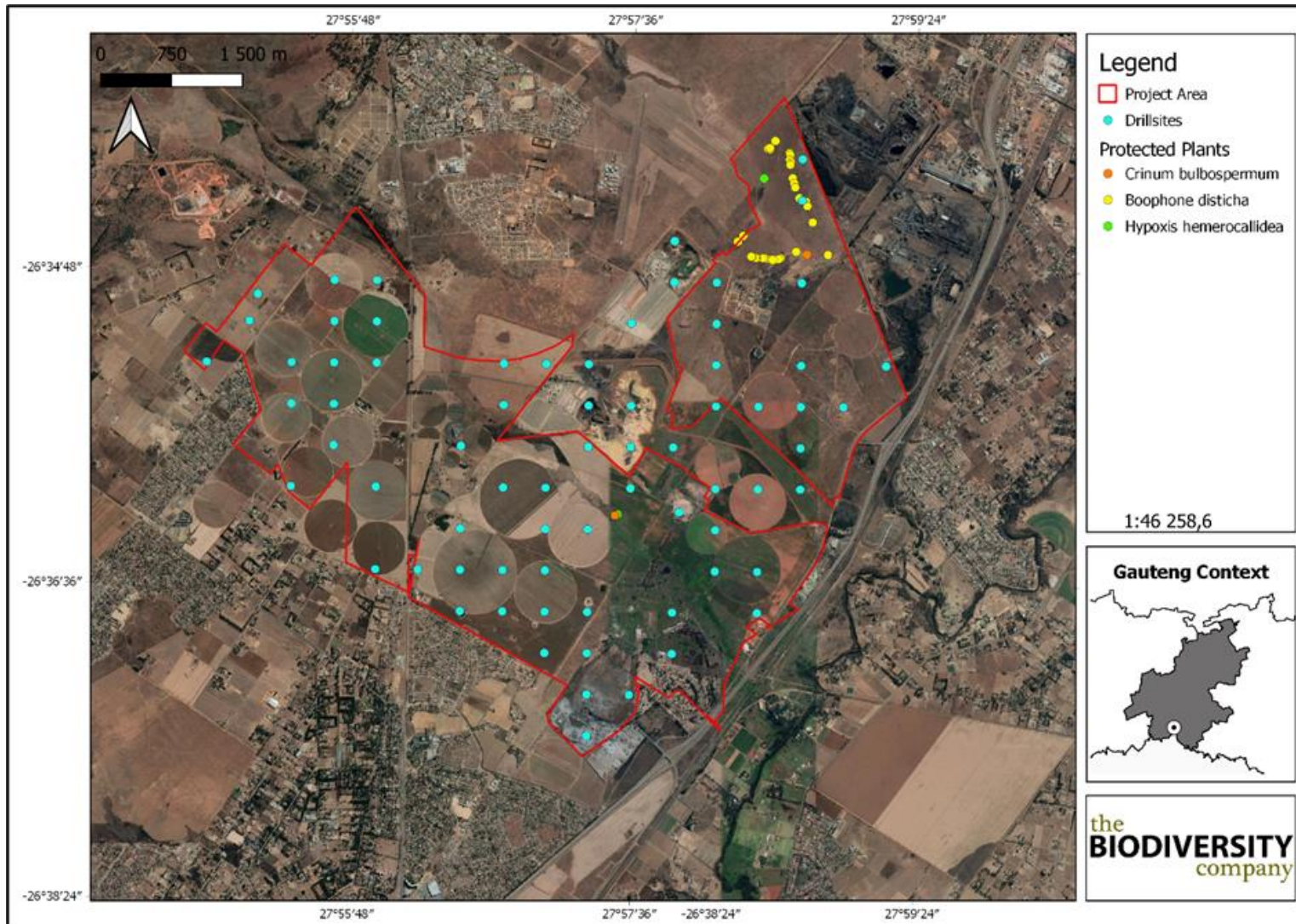


Figure 15: Locations of the protected plant species marked during the specialist field survey.



3.1.2.11.2 ALIEN AND INVASIVE PLANTS

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition, and function of these systems. Therefore, it is important that these plants are controlled and eradicated by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, 1 August 2014, and was amended in February 2018 in the Government Gazette No. 41445. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse.

Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing
- Take steps to manage the listed invasive species in compliance with:
 - Section 75 of the Act;
 - The relevant invasive species management programme developed in terms of regulation 4; and
 - Any directive issued in terms of section 73(3) of the Act.

Twenty (20) alien and/or invasive plants were recorded during the field survey within the project area. It is recommended that an Alien Plant Species Management Plan be implemented within the project areas in order to prevent the prospecting activities and movement exacerbating the infestation.



3.1.2.12 FAUNA

3.1.2.12.1 AVIFAUNA

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 273 bird species have the potential to occur in the vicinity of the project area. The full list of potential bird species is provided in Appendix E of the BAR.

Of the potential bird species, twelve (12) species are listed as SCC either on a regional or global scale (Table 9 4). The SCC include the following:

- Two (2) species that are listed as EN on a regional basis;
- Three (3) species that are listed as VU on a regional basis; and
- Seven (7) species that are listed as NT on a regional basis.
- On a global scale five (5) species as NT

Table 8: List of bird species of regional or global conservation importance that are expected to occur in close vicinity to the project area (South African Bird Atlas Project, Version 2 (SABAP2)).

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT	Moderate
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC	Low
<i>Circus ranivorus</i>	Marsh-harrier, African	EN	LC	High
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied	VU	LC	High
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	High
<i>Falco vespertinus</i>	Falcon, Red-footed	NT	NT	High
<i>Glareola nordmanni</i>	Pratincole, Black-winged	NT	NT	Moderate
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC	Moderate
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	NT	Moderate
<i>Phoenicopterus minor</i>	Flamingo, Lesser	NT	NT	Low
<i>Phoenicopterus ruber</i>	Flamingo, Greater	NT	LC	Low
<i>Rostratula benghalensis</i>	Painted-snipe, Greater	NT	LC	Moderate
<i>Sterna caspia</i>	Tern, Caspian	VU	LC	Moderate

Important Bird & Biodiversity Areas (IBAs) are the sites of international significance for the conservation of the world's birds and other conservation significant species as identified by Birdlife International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity (Birdlife, 2017). The project area is approximately 9.8km away from the Suikerbosrand Nature Reserve IBA and therefore no IBAs will be affected by this prospecting right application.



3.1.2.12.2 MAMMALS

The IUCN Red List Spatial Data (IUCN, 2017) lists 79 mammal species that could be expected to occur within the project area. Of these species, 11 are medium to large conservation dependant species, such *Ceratotherium simum* (Southern White Rhinoceros) and *Tragelaphus oryx* (Common Eland) that, in South Africa, are generally restricted to protected areas such as game reserves. These species are not expected to occur in the project area and are removed from the expected SCC list. They are however still included in the expected species list (Refer to Appendix E of the BAR).

Of the remaining 68 small to medium sized mammal species, fourteen (14) (20.5%) are listed as being of conservation concern on a regional or global basis (Table 9 5). The list of potential species includes:

- Two (2) that are listed as EN on a regional basis;
- Four (4) that are listed as VU on a regional basis; and
- Six (6) that are listed as NT on a regional scale.
- On a global scale, 1 species is listed as EN, 2 are listed as VU and 5 as NT (Table 9)

Table 9: List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses

Species	Common Name	Conservation Status			Likelihood of occurrence
		Regional (2016)	(SANBI, IUCN (2017))	IUCN (2017)	
<i>Aonyx capensis</i>	Cape Clawless Otter	NT		NT	High
<i>Atelerix frontalis</i>	South Africa Hedgehog	NT		LC	High
<i>Crocidura maquassiensis</i>	Makwassie musk shrew	VU		LC	Moderate
<i>Eidolon helvum</i>	African Straw-colored Fruit Bat	LC		NT	Low
<i>Felis nigripes</i>	Black-footed Cat	VU		VU	Low
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU		NT	High
<i>Leptailurus serval</i>	Serval	NT		LC	High
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU		EN	Moderate
<i>Ourebia ourebi</i>	Oribi	EN		LC	Low
<i>Panthera pardus</i>	Leopard	VU		VU	Low
<i>Parahyaena brunnea</i>	Brown Hyaena	NT		NT	Low
<i>Pelea capreolus</i>	Grey Rhebok	NT		NT	Low
<i>Poecilogale albinucha</i>	African Striped Weasel	NT		LC	Moderate



<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC	Low
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3.1.2.12.3 REPTILES AND AMPHIBIANS

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the Reptile Map database provided by the Animal Demography Unit (ADU, 2019) 57 reptile species have the potential to occur in the project area (Appendix E). One of the expected species are SCCs (IUCN, 2017).

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the Amphibian Map database provided by the Animal Demography Unit (ADU, 2019) 21 amphibian species have the potential to occur in the project area. No amphibian SCCs are expected to occur in the project area.

Table 10: Reptiles species of conservation concern that may occur in the project area as well as their global and regional conservation statuses (IUCN, 2017; SANBI, 2016).

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Crocodylus niloticus</i>	Nile Crocodile	VU	LC	Low

3.1.2.13 WATERCOURSES

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA) 2018. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018.

Ecosystem threat status (ETS) of river ecosystem types is based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LC, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer et al., 2019; Skowno et al., 2019).

Figure 16 shows that a not protected wetland and a poorly protected wetland can be found in the project area. Both a not protected and a poorly protected river can also be found in the project area. Figure 17 shows that these wetlands are CR and LC respectively while the river has an ecosystem threat status of CR.

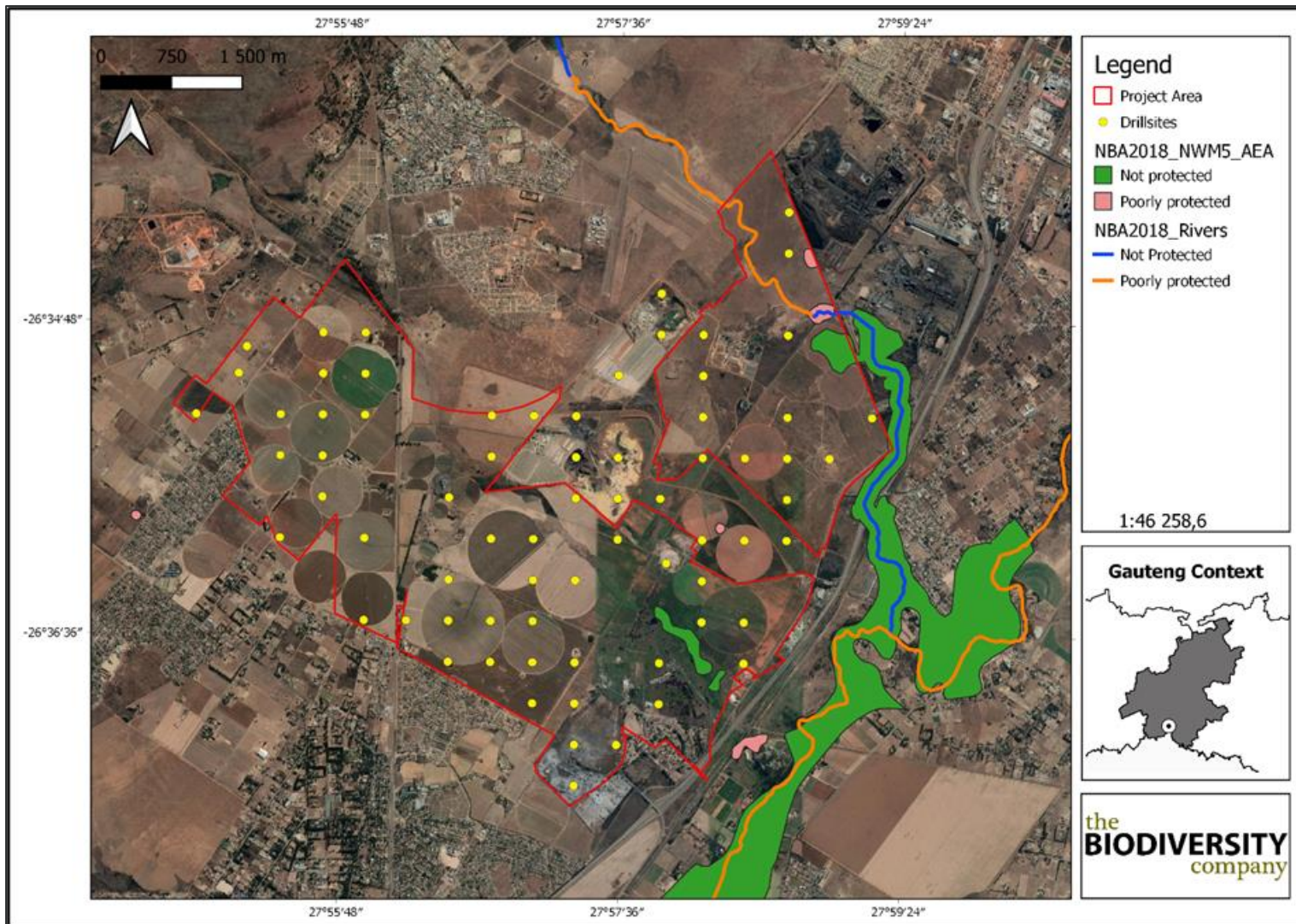


Figure 16: The project area in relation to the protection status of the wetland (NBA, 2018).

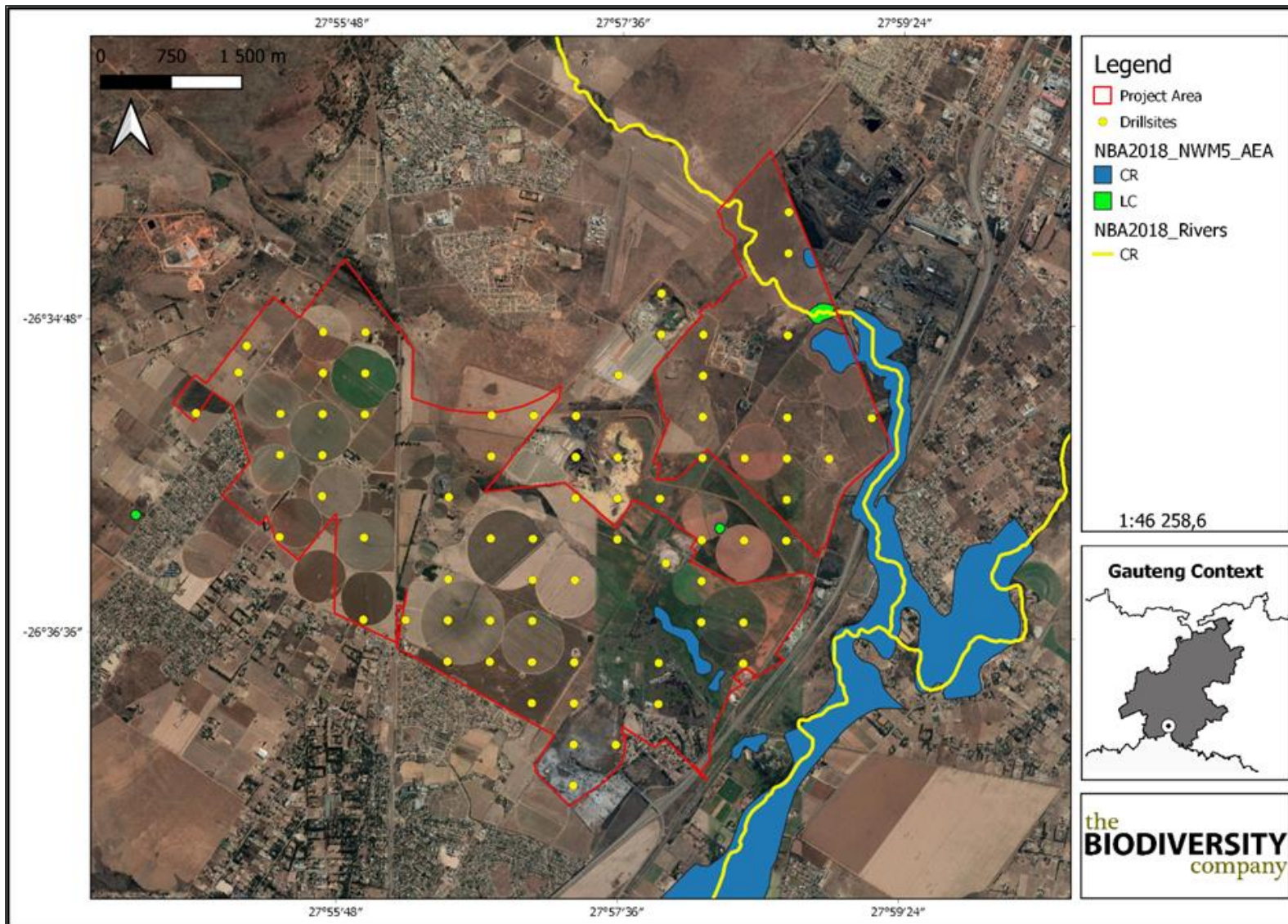


Figure 17: The project area in relation to the threat status of the wetland (NBA, 2018).



3.1.2.14 **CULTURAL AND HERITAGE**

The heritage impact assessment and desktop palaeontological impact assessment identified various heritage resources within the study area, including burial grounds and graves, historical structures, palaeontological resources and archaeological resources that could be impacted during project activities.

3.1.2.14.1 BURIAL GROUNDS AND GRAVES

The Heritage Impact Assessment (HIA) identified six graves and burial grounds that would be impacted due to activities associated with the drill site establishment. Mitigation measures would include avoidance of these sites with a buffer of at least 50m.

The pre-mitigation Environmental Risk impact significance is rated as Medium negative, and with the implementation of the required mitigation measures, the post-mitigation ER impact would become Low negative. The overall Environmental significance will be Low to Medium negative.

3.1.2.14.2 HISTORICAL STRUCTURES

The HIAS study identified five sites containing historical structures within the Kookfontein study area. Mitigation measures would include avoidance of these sites with a buffer of at least 50m (especially site KF008) (Figure 18).

The pre-mitigation Environmental Risk impact significance is rated as Medium negative, and with the implementation of the required mitigation measures the post-mitigation ER impact will be Low. The overall Environmental significance would be Medium negative.

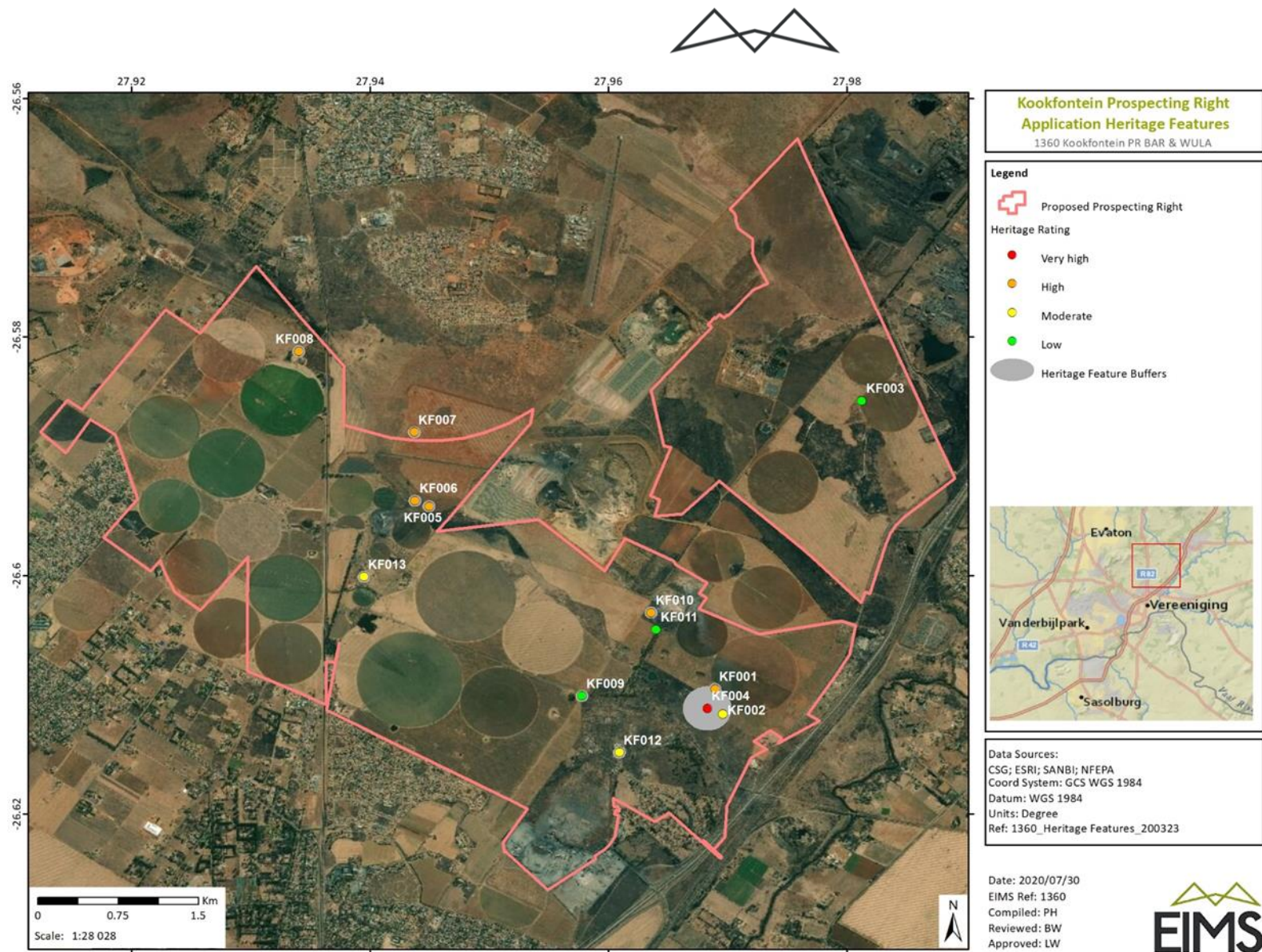


Figure 18: Map showing heritage sensitivity rating of identified heritage resources



3.1.2.14.3 PALAEOLOGY

The geological map of the study area overlain on the SAHRIS palaeo-sensitivity map Figure 19, th indicates that the majority of the geological formations underlying the study area have a High to Very High palaeontological sensitivity (red/orange colour). This indicates that there is a Very High possibility of finding fossils in the Vryheid Formation while the possibility of finding fossils in the Malmani and Quaternary deposits is High. It is therefore recommended that a field assessment and protocol for finds is required to be undertaken.

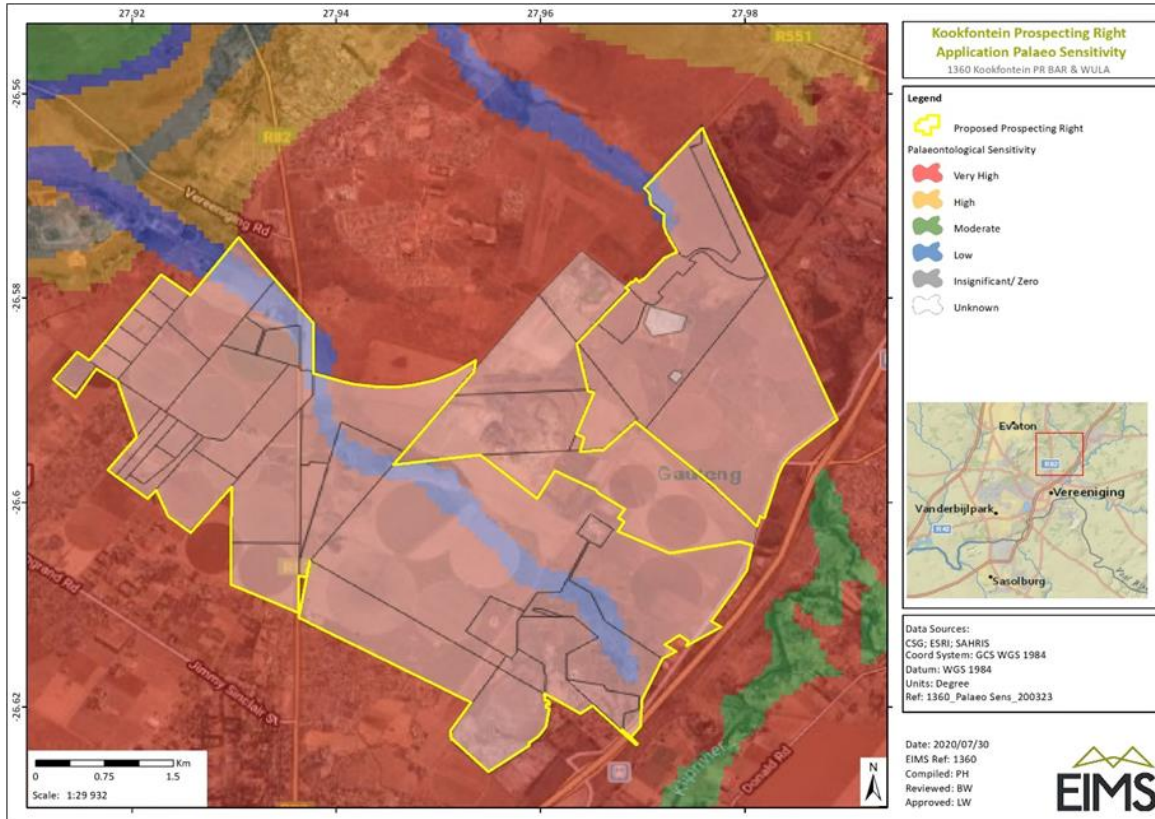


Figure 19: Extract of the 1: 250 000 SAHRIS Palaeo-sensitivity Map (Kookfontein Application Area)

Colour	Sensitivity	Required Action
Red	Very High	Field assessment and protocol for finds is required
Orange/Yellow	High	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
Green	Moderate	Desktop study is required
Blue	Low	No palaeontological studies are required however a protocol for finds is required
Grey	Insignificant/Zero	No palaeontological studies are required
White/Clear	Unknown	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.



3.1.2.14.4 ARCHAEOLOGY

There is one known formally protected archaeological site (Redan rock engraving site) located within the study area and at least one previously archaeological find spot was identified in a previous study. This site should be demarcated as a “no go” area with a buffer zone of at least 200m.

The pre-mitigation Environmental Risk impact significance for the Provincial Heritage Site (Redan) is rated as High negative, and with the implementation of the required mitigation measures the post-mitigation ER impact will be Low negative. The overall Environmental significance would be Medium negative.

3.1.2.15 DESCRIPTION OF CURRENT LAND USES

The proposed properties are situated west of the R59 tar road that passes past the project area Vereeniging to Meyerton. Several farm roads and servitude gravel roads cross these properties. Existing power lines are also situated across these properties.

The proposed properties are expected to be generally flat, with a few drainage lines across most of the properties. The area is predominantly characterised by intensive agriculture and grazing, agricultural smallholdings and farmsteads, with some mining activities, residential urban development and industrial development.

3.1.2.16 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON SITE

The most notable infrastructure located within the application area includes the following:

- Households;
- Industries;
- Mining areas;
- Power Lines;
- Randwater Pipeline;
- A Landfill;
- Roads; and
- Waste Treatment Works.

3.1.2.17 SOCIO-ECONOMIC

The proposed Kookfontein Prospecting Project will be situated on several farm portions as identified in Table 4. The area is located approximately 7km north of Vereeniging and 4km southwest from Meyerton. The application area falls within the Emfuleni Local Municipality (LM) as well as the Midvaal LM, within the Sedibeng District Municipality in the Gauteng Province. The prospecting area falls within ward 16 of Emfuleni LM and ward 3 of Midvaal LM within the Sedibeng District Municipality (SDM).

Emfuleni LM has the smallest land cover of all the local municipalities within the SDM with an area of 987.45 km². Emfuleni LM has two main city/town centres, namely, Vereeniging and Vanderbijlpark and forms the centre of what was formerly known as the Vaal triangle, renowned for its contribution to the iron and steel industry in South Africa. Emfuleni LM also contains six large peri-urban townships namely Evaton, Waldrift, Rust-er-Vaal, Roshness and Deonairpark.

According to Census 2011, the Emfuleni LM has a total population of 721 663 people, of which 85.4% are black African, 12% are white, 1.2 % are coloured and 1% are Indian/Asian. Other groups make up 0,4% of the population. The education levels in the LM are low. Of those aged 20 years and older, 36.7% have some secondary schooling, 3.6% have completed primary schooling, 32.4 % completed Grade 12/matric, 12.9% have some higher education, and 4 % of have no schooling.



The main economic activity within the Emfuleni LM is manufacturing. Manufacturing contributes 36.5 % of the municipalities gross value add (GVA, approximately R16.9 billion) and 87% of the SDM total manufacturing output. Of the 202 543 economically active people (employed and unemployed but looking for work), 34.7% (107 555) are unemployed. 20145 people are classified as discouraged work-seekers. Of the 85 594 economically active youth (aged 15 – 35), 45% are unemployed.

There are 220 135 households in the municipality, with an average household size of 3,1 persons per household. Of the households in the municipality, 69.9% have access to piped (tap) water inside the dwelling/institution, 88.2% have a flush toilet connected to sewage systems, 89.8% have weekly refuse removal and 92.2% have electricity for lighting.

The Census 2011 shows that there is a broad distribution of incomes across households in the Emfuleni LM with the largest portion, 16.4% of households earning between R19 601 – R38 200 per annum. Approximately, 14.5% of all households earn no income.

Midvaal Local Municipality (LM) is an administrative area in the SDM. The LM is the largest of the 3 municipalities in the SDM covering an area of 1 722 km². The Midvaal LM consists of predominantly rural area with extensive farming constituting approximately 50% of the total area.

According to the Midvaal IDP, the Midvaal LM has a total population of 95301 people, of which 58.5% are black African, 39.1% are white, 1.6 % are coloured and 0.8% are Indian/Asian. The education levels in the LM are low. Of the total LM population, 34.40% have some secondary schooling, 3.80% have completed primary schooling, 32.3 % completed Grade 12/matric, 15.3% have some higher education, and 5.2% of have no schooling.

The main economic activities within the LM are manufacturing, finance, government, community and social services and wholesale and retail trade. Of the LM economic activities manufacturing contributes 27.6 %, finance contributes 24.1%, government, community and social services contributes 23.6% and wholesale and retail trade contribute 15.1%. Cumulatively, these activities contribute to 90.4% to the local economy. Of the 45956 economically active people (employed and unemployed but looking for work), 18.8% (8620) are unemployed. 1939 people are classified as discouraged work-seekers.

There are 29 965 households in the municipality, with an average household size of 3,05 persons per household. Of the households in the municipality, 64.9% have access to piped (tap) water inside the dwelling/institution, 58% have a flush toilet connected to sewage systems, 82.1% have weekly refuse removal and 79.3% have electricity for lighting.

The Demacon Midvaal Economic Analysis (2015) shows that there is a broad distribution of incomes across households in the Midvaal LM with the largest portion, 16.5%, of households earning between R21 350- R42 698 per annum. Approximately, 13.9% of all households earn no income.

3.1.3 STAKEHOLDER ISSUES AND COMMENTS

A public participation process as required by the NEMA 2014 EIA regulations will be undertaken for the proposed prospecting activities. In this regard please refer to Section 6.2 and Appendix B of the BAR for a comprehensive record of the process followed and comments received. Once comments have been received, an extract from the Public Participation Report (PPR) which relate to final rehabilitation, decommissioning and closure activities will be provided in this section. The comments and issues raised through the public participation will be considered and inform the compilation of this FRDCP.

3.2 ENVIRONMENTAL RISK ASSESSMENT

Section 8 of the BAR provides a detailed description of the environmental impact/risk identification and assessment (including the methodology and findings) undertaken for the proposed prospecting activity. This risk assessment assesses each identified environmental impact by considering the consequence of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/likelihood of the impact occurring. The BAR further considers other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, to determine a prioritisation factor (PF) which is applied to the Environmental Risk to determine the overall significance.



Table 11 lists the environmental impacts and risks identified and assessed in the EIA/ Basic Assessment, which relate to final rehabilitation, decommissioning and closure of the prospecting activity. The EMPr addresses the management and mitigation of environmental impacts associated with the preceding phases whilst the annual environmental rehabilitation plan (to be prepared and reviewed annually) will provide for the planning and financial provisioning for the concurrent and progressive rehabilitation and remediation activities.

The applicable conceptual closure strategy to avoid, manage and mitigate the impacts and risks are also included in Table 11 together with the re-assessment of the environmental risk. The environmental risk assessment of the impacts associated with final rehabilitation, decommissioning and closure will inform the most appropriate closure strategy for the prospecting activity. It is expected that, in most cases, if all the management and mitigation measures identified in the EIA/ Basic Assessment and EMPr are adhered to and successfully implemented, then no latent or residual environmental impacts will remain. Impacts that are classified as high risk post-mitigation will be considered as latent environmental impacts and financial provision will be provided to remediate these specific impacts. Please see Section 5 for further details.



Table 11: Impact Assessment for Rehabilitation, Decommissioning and Closure.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
Site establishment / de establishment	Damage and Destruction of graves: Burial Grounds and Graves (KF001, KF002, KF005, KF006, KF007, KF010))	Prospecting Areas, Site area	Construction Decommissioning	-16.00	<ul style="list-style-type: none"> Fencing of the identified graves and burial grounds and strict avoidance of these sites with a buffer zone of at least 50m. 	-7.56
	Damage/destruction to structures: Historical structures- Klip Power & Springfield Colliery (KF009, KF011, KF012, KF013)	Prospecting Areas, Site area	Construction Decommissioning	-14.00	<ul style="list-style-type: none"> Avoidance of these sites with a buffer zone of at least 50m. 	-6.25
	Impact on Air quality from dust	Prospecting Areas, Site area	Construction Decommissioning	-4.50	<ul style="list-style-type: none"> Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and dumps especially. This includes wetting of exposed soft soil surfaces; adherence to speed limits and not conducting activities on windy days which will increase the likelihood of dust being generated. 	-2.50
	Generation and disposal of waste	Prospecting Areas, Site area	Construction Decommissioning	-6.00	<ul style="list-style-type: none"> Waste management must be a priority and all waste must be collected and stored effectively. 	-4.50



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> • Litter, spills, fuels, chemicals and human waste must be avoided in and around the project area. • A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. • Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site. • Refuse bins will be emptied and secured Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					waste storage period will be 10 days.	
	Noise	Prospecting Areas, Site area	Construction Decommissioning	-4.50	<ul style="list-style-type: none"> Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals. 	-3.00
	Safety and security risks to landowners and lawful occupiers	Prospecting Areas, Site area	Construction Decommissioning	-6.00	<ul style="list-style-type: none"> Strict Site access control. 	-4.00
	Interference with existing land uses	Prospecting Areas, Site area	Construction Decommissioning	-7.00	<ul style="list-style-type: none"> Consultation with Landowners. 	-5.85
	Deterioration and damage to existing access roads and tracks	Prospecting Areas, Site area	Construction Decommissioning	-8.00	<ul style="list-style-type: none"> Strict Site access control. Demarcation of access roads to be used. 	-5.00
	Destruction, further loss and fragmentation of the vegetation community	Prospecting Areas, Site area	Construction Decommissioning	-17.00	<ul style="list-style-type: none"> Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property by making use of spatial data. 	-7.50



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> • Areas of indigenous vegetation, even secondary vegetation communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. Maintain small patches of natural vegetation within the prospecting site to accelerate restoration and succession of cleared patches. • When vegetation is cleared, hand cutting techniques should be used as far possible in order to avoid the use of heavy machinery. • All construction/operational and access vehicles and machinery must make use of the existing roads. • All laydown, chemical toilets etc. should be restricted to least concern sensitivity areas. • Any materials may not be stored for extended periods of time and must be removed from the project area once 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<p>the construction/closure phase has been concluded.</p> <ul style="list-style-type: none"> • No permanent structures should be permitted at drill sites. • Buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. • No storage of vehicles or equipment will be allowed outside of the designated project areas. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. • All structure footprints to be rehabilitated and landscaped after prospecting is complete. • Rehabilitation of the disturbed areas as a result of prospecting activities the project area must be made a priority. • Topsoil must also be utilised, and any disturbed area must 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<p>be re-vegetated with plant and grass species which are endemic to this vegetation type.</p> <ul style="list-style-type: none"> • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. • Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion. • It should be made an offence for any staff to /take bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. • Any topsoil that is removed during construction must be appropriately removed and stored according to the national and provincial guidelines. This includes on-going maintenance of such 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
	Loss of CBA and ESA, sections of area classed as moderate and highest biodiversity importance as well as portions of an area classified as a protected area.	Prospecting Areas, Site area	Construction Decommissioning	-21.25	<p>topsoil piles so that they can be utilised during decommissioning phases and re-vegetation.</p> <ul style="list-style-type: none"> • Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. • Clearing of vegetation should be minimized and avoided where possible. Maintain small patches of natural vegetation within the prospecting site to accelerate restoration and succession of cleared patches. • When vegetation is cleared, hand cutting techniques should be used as far possible in order to avoid the use of heavy machinery. • All construction/operational and access must make use of the existing roads. 	-6.19



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> • All laydown, chemical toilets etc. should be restricted to least concern sensitivity areas. • Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. • No permanent structures should be permitted at drill sites. Buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. • No storage of vehicles or equipment will be allowed outside of the designated project areas. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. • All structure footprints to be rehabilitated and landscaped after prospecting is complete. 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> • Rehabilitation of the disturbed areas as a result of the prospecting activities in the project area must be made a priority. • Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank • Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion. • It should be made an offence for any staff to /take bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> Any topsoil that is removed during construction must be appropriately removed and stored according to the national and provincial guidelines. This includes ongoing maintenance of such topsoil piles so that they can be utilised during decommissioning phases and re-vegetation. 	
	Introduction of alien species, especially plants	Prospecting Areas, Site area	Construction Decommissioning	-14.00	<ul style="list-style-type: none"> Compilation of and implementation of an alien vegetation management plan. The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. 	-5.00



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
	Erosion due to storm water runoff and wind	Prospecting Areas, Site area	Construction Decommissioning	-14.00	<ul style="list-style-type: none"> • A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the likely presence of SCCs. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank • Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. 	-9.38



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, rock chips, vibration and poaching).	Prospecting Areas, Site area	Construction Decommissioning	-16.00	<ul style="list-style-type: none"> • Speed limits must still be enforced to ensure that road killings and erosion is limited. • A qualified environmental control officer must be on site when construction begins to identify SCC that will be directly disturbed and to relocate fauna/flora that are found during the prospecting activities. • The area must be walked though prior to construction to ensure no faunal species remain in the habitat and get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated. • Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals. • No trapping, killing, or poisoning of any wildlife is to be allowed. 	-8.44



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> • The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna. • Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas such as the wetland. • Fluorescent and mercury vapor lighting should be avoided and sodium vapor (yellow) lights should be used wherever possible. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. • Speed limits must still be enforced to ensure that road killings and erosion is limited. • Schedule prospecting activities and operations during least sensitive periods, 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					to avoid migration, nesting and breeding seasons. <ul style="list-style-type: none"> The holes need to be sealed to ensure that no fauna species can fall in the drill hole. 	
	Potential leaks, discharges, pollutants from drilling machines and storage leaching into the surrounding environment	Prospecting Areas, Site area	Construction Decommissioning	-14.00	<ul style="list-style-type: none"> A spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Leaking equipment and vehicles must be repaired immediately or be removed 	-5.00



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					from project area to facilitate repair. <ul style="list-style-type: none"> Storm Water run-off & Discharge Water Quality. 	
Temporary Storage of hydrocarbons (Diesel or chemicals for toilets)	Potential leaks, discharges, pollutant from drilling machines and storage leaching into the surrounding environment	Drilling	Construction Operation Decommissioning	-14.00	<ul style="list-style-type: none"> All laydown, chemical toilets etc. should be restricted to least concern sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No permanent structures should be permitted at drill sites. Buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated project areas. A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area. 	-5.00



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> • A site plan of the camp must be provided indicating domestic waste areas, chemical storage areas, fuel storage area, site offices and placement of ablution facilities. • All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner so as to prevent pollution of the environment or harm to people or animals. • The Contractor should inform all site staff to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities • Any possible contamination of topsoil by hydrocarbons, concrete or concrete water must be avoided. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<p>collected shall be disposed of at a licensed disposal facility.</p> <ul style="list-style-type: none"> • Where a registered disposal facility is not available close to the prospecting area, the Contractor shall provide a method statement with regard to waste management. • Under no circumstances may domestic waste be burned on site. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility • Appropriate measures must be implemented to prevent spillage and appropriate steps must be taken to prevent pollution in the event of a spill; and way that does not pose any danger of pollution even during times of high rainfall. • Adequate spill prevention and clean-up procedures should be developed and implemented during the prospecting activities. 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none"> • The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site. • No storage of vehicles or equipment will be allowed outside of the designated prospecting area. • Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. • No servicing of equipment on site unless absolutely necessary. • Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. • The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site. • All vehicles and equipment must be well maintained to ensure that there are no oil or fuel leakages. • All contaminated soil / yard stone shall be treated in situ 	



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					or removed and be placed in containers. <ul style="list-style-type: none"> • A specialist Contractor shall be used for the bioremediation of contaminated soil where the required remediation material and expertise is not available on site. • Compacting of soil must be avoided as far as possible, and the use of heavy machinery must be restricted in areas outside of the proposed exploration sites to reduce the compaction of soils. • Should any major spills of hazardous materials take place, such should be reported in terms of the Section 30 of the NEMA. 	
Undertake Decommissioning and closure and rehabilitation as per the annual and final rehabilitation plan	Damage and Destruction of graves: Burial Grounds and Graves (KF001, KF002, KF005. KF006, KF007, KF010))	Decommissioning	Decommissioning	-16.00	<ul style="list-style-type: none"> • Fencing of the identified graves and burial grounds and strict avoidance of these sites with a buffer zone of at least 50m. 	-7.56
	Damage/destruction to structures: Historical	Decommissioning	Decommissioning	-14.00	<ul style="list-style-type: none"> • Avoidance of these sites with a buffer zone of at least 50m 	-7.56



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
	structures- Klip Power & Springfield Colliery (KF009, KF011, KF012, KF013)					
	Damage/destruction of structures: Farmstead (KF008)	Decommissioning	Decommissioning	-15.00	<ul style="list-style-type: none"> Avoidance of these sites with a buffer zone of at least 50m. 	-6.25
	Damage/destruction of site: Redan Archaeological Site (KF004)	Decommissioning	Decommissioning	-20.00	<ul style="list-style-type: none"> Site should be flagged as a "no go" area and be demarcated with a buffer zone of at least 200m. 	-10.00
	Continued encroachment of an indigenous and EN vegetation community by alien invasive plant species as well as erosion due to disturbed soils Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic	Decommissioning	Decommissioning	-15.00	<ul style="list-style-type: none"> Any topsoil that is removed during construction must be appropriately removed and stored according to the national and provincial guidelines. This includes ongoing maintenance of such topsoil piles so that they can be utilised during decommissioning phases and re-vegetation. Drill sites must be decommissioned and rehabilitated on completion of drilling each hole, and not left to be rehabilitated on completion of the drilling programme. 	-8.44



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
	disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).					
	Damage and Destruction of graves: Burial Grounds and Graves (KF001, KF002, KF005, KF006, KF007, KF010))	Prospecting Areas, Site area	Rehabilitation	-12.00	<ul style="list-style-type: none"> Fencing of the identified graves and burial grounds and strict avoidance of these sites with a buffer zone of at least 50m. 	--7.56
	Damage/destruction to structures: Historical structures- Klip Power & Springfield Colliery (KF009, KF011, KF012, KF013)	Prospecting Areas, Site area	Rehabilitation	-10.50	<ul style="list-style-type: none"> Avoidance of these sites with a buffer zone of at least 50m. 	-6.25
	Damage/destruction of structures: Farmstead (KF008)	Prospecting Areas, Site area	Rehabilitation	-11.25	<ul style="list-style-type: none"> Avoidance of these sites with a buffer zone of at least 50m. 	-10.00
	Damage/destruction of site: Redan Archaeological Site (KF004)	Prospecting Areas, Site area	Rehabilitation	-16.00	<ul style="list-style-type: none"> Site should be flagged as a "no go" area and be demarcated with a buffer zone of at least 200m. 	-9.75



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
Monitoring of rehabilitation efforts	Erosion due to improper rehabilitation	Closure and Rehabilitation	Rehabilitation/ Post-rehabilitation	-11.00	<ul style="list-style-type: none"> • The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority. • The monitoring activities during this period will include but not be limited to: • Biodiversity monitoring. • Removed vegetation should be preserved and replaced for rehabilitation of the drill sites. Rehabilitation should be completed for the closure of each hole, and not at the end of the drilling programme. • Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management. 	-8.75



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE IN WHICH IMPACT IS ANTICIPATED	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE	SIGNIFICANCE IF MITIGATED
					<ul style="list-style-type: none">Restoration success should be monitored through a follow-up site visit during the next growing season in order to identify remedial actions	

It is important to note that the environmental risk assessment will be revised and updated on an annual basis to ensure that this FRDCP remains applicable to the actual and predicted environmental impacts and risks.



3.3 ENVIRONMENTAL INDICATORS AND MONITORING

Table 12 provides a list of the identified environmental impacts identified for the rehabilitation, decommissioning and closure of the prospecting activity. In addition, environmental indicators are identified for each impact, together with proposed monitoring requirements. The indicators and monitoring will aim to inform ongoing rehabilitation and remediation activities. These indicators will also inform the assessment of whether the closure objectives have been adequately met.

Table 12: Environmental Indicators and Monitoring Requirements

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Prospecting boreholes: 58 sites, with a maximum of 20 m in depth.	Prospecting	40m ² , short term	<ul style="list-style-type: none"> • Drill sites must be limited to areas regarded as least concern sensitivity as depicted in the sensitivity map; • All high sensitivity areas must be avoided and declared “No-go” areas; • Fencing of the identified graves and burial grounds and strict avoidance of these sites with a buffer zone of at least 50m; • Avoidance of historical sites with a buffer zone of at least 50m; • Archaeological Site (Redan Engraving site) to be marked as a no-go area with at least a 200m buffer; • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further; • Clearing of vegetation should be minimized and avoided where possible; • Maintain small patches of natural vegetation within the prospecting site to accelerate restoration and succession of cleared patches; • Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for 	Prospecting boreholes: 58 sites, with a maximum of 20 m in depth.	Prospecting



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			<p>all roads and dumps especially. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated;</p> <ul style="list-style-type: none"> • Local residents should be notified of any potentially noisy activities or work and these activities should be undertaken at reasonable times of the day. These works should not take place at night or on weekends; • Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals; • Outside lighting should be designed and limited to minimize impacts on fauna; • All outside lighting should be directed away from highly sensitive areas such as the wetland. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (yellow) lights should be used wherever possible; • When working near to a potential sensitive area, the contractor must limit the number of simultaneous activities to the minimum; • Schedule prospecting activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons; • The holes need to be sealed to ensure that no fauna species can fall in the drill hole; • Ensure proper storage of fuels; • On-site vehicles must be limited to approved access routes and areas on the site so as to 		



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			<p>minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic;</p> <ul style="list-style-type: none"> • Workforce should be kept within defined boundaries and to agreed access routes; • No invasive prospecting activities to be undertaken within 50m of a watercourse; • Should any watercourse be affected, then the necessary water use licences should be obtained from the Department of Water and Sanitation; and • No abluion or site laydown areas are to be located within 150m of a watercourse. 		
Borehole Closure	Decommissioning and Closure	Short term and localized	<ul style="list-style-type: none"> • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank; • Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion; • All structure footprints to be rehabilitated and landscaped after prospecting is complete; • Rehabilitation of the disturbed areas existing in the project area must be made a priority; • Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type; • Areas that are denuded during prospecting need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of 	NWA DWAF BPG	Throughout Decommissioning and Closure



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			<p>encroachment by alien invasive plant species; and</p> <ul style="list-style-type: none"> A fire management plan needs to be complied and implemented to restrict the impact fire might have on the rehabilitated areas. 		
Removal of surface infrastructure	Decommissioning	Short term and localized	<ul style="list-style-type: none"> All infrastructure, equipment, and other items used during prospecting will be removed from the site. 	MPRDA Rehab Plan	Decommissioning
Removal of waste	Decommissioning	Small scale and localized	<ul style="list-style-type: none"> Waste management must be a priority and all waste must be collected and stored effectively; Litter, spills, fuels, chemicals and human waste in and around the project area; A minimum of one toilet must be provided per 10 persons; Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area; The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility; Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site; Refuse bins will be emptied and secured Temporary storage of domestic waste shall be in covered waste skips; 	NWA DWAF BPG	Decommissioning



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Rehabilitation	Rehabilitation	All disturbed areas	<ul style="list-style-type: none"> • Maximum domestic waste storage period will be 10 days. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further; • Clearing of vegetation should be minimized and avoided where possible; • Maintain small patches of natural vegetation within the prospecting site to accelerate restoration and succession of cleared patches; • Areas that are denuded during prospecting need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; • All structure footprints to be rehabilitated and landscaped after prospecting is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority; • Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type; • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank; • Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion; 	MPRDA Rehab Plan NEMA	Rehabilitation



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			<ul style="list-style-type: none"> • A fire management plan needs to be complied and implemented to restrict the impact fire might have on the rehabilitated areas; • All debris and contaminated soils must be removed and suitably disposed of; • All surface infrastructure on site must be removed; and • Sites must be monitored by the ECO (including relevant specialist's inputs if, necessary) for adequate rehabilitation until the desired rehabilitation objectives have been achieved. 		
Monitoring	Post-Closure	All rehabilitated areas	<ul style="list-style-type: none"> • The post-closure monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified party for a minimum of one (1) year unless otherwise specified by the competent authority; and • The monitoring activities during this period will include but not be limited to: <ul style="list-style-type: none"> ○ Vegetation cover and composition; • Re-vegetation of disturbed areas where required; and • Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management. 	MPRDA Rehab Plan	Post-operation



3.4 DESIGN PRINCIPLES

3.4.1 LEGISLATIVE AND GOVERNANCE FRAMEWORK

The requirement for final rehabilitation, decommissioning and closure stems primarily from the legislative requirements of the MPRDA and the NEMA. The relevant extracts from each of these are presented in this section. Please also refer to Section 3 of the BAR for an overview of other enviro-legal requirements which may influence closure planning.

3.4.1.1 MINERALS AND PETROLEUM RESOURCES DEVELOPMENT ACT, ACT 28 OF 2002

The following extracts relate to the principle of closure for any right issued under the MPRDA:

- Section 43(1): The holder of a prospecting right, mining right, retention permit, mining permit, or previous holder of an old order right or previous owner of works that has ceased to exist, remains responsible for any environmental liability, pollution, ecological degradation, the pumping and treatment of extraneous water, compliance to the conditions of the environmental authorisation and the management and sustainable closure thereof, until the Minister has issued a closure certificate in terms of this Act to the holder or owner concerned.
- Section 43(4): An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the required information, programmes, plans and reports prescribed in terms of this Act and the National Environmental Management Act, 1998.
- Section 43 (5): No closure certificate may be issued unless the Chief Inspector and each government department charged with the administration of any law which relates to any matter affecting the environment have confirmed in writing that the provisions pertaining to health and safety and management pollution to water resources, the pumping and treatment of extraneous water and compliance to the conditions of the environmental authorisation have been addressed.
- Section 43 (7): The holder of a prospecting right, mining right, retention permit, mining permit, or previous holder of an old order right or previous owner of works that has ceased to exist, or the person contemplated in subsection (2), as the case may be, must plan for, manage and implement such procedures and such requirements on mine closure as may be prescribed.
- Section 43 (8): Procedures and requirements on mine closure as it relates to the compliance of the conditions of an environmental authorisation, are prescribed in terms of the National Environmental Management Act, 1998.

3.4.1.2 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT REGULATIONS

The following extracts from the MPRDA Regulations are specifically applicable to the preparation of this FRDCP:

- Regulation 51 (a)(i): An environmental management programme contemplated in section 39(1) of the Act must include the following: A description of the environmental objectives and specific goals for mine closure;
- Regulation 54: Quantum of financial provision:
 - (1) The quantum of the financial provision as determined in a guideline document published by the Department from time to time, include a detailed itemization of all actual costs required for-
 - a. premature closure regarding- (i) the rehabilitation of the surface of the area; (ii) the prevention and management of pollution of the atmosphere; and (iii) the prevention and management of pollution of water and the soil; and (iv) the prevention of leakage of water and minerals between subsurface formations and the surface.



- b. decommissioning and final closure of the operation; and
 - c. post closure management of residual and latent environmental impacts.
 - (2) The holder of a prospecting right, mining right or mining permit must annually update and review the quantum of the financial provision –
 - a. in consultation with a competent person;
 - b. as required in terms of the approved environmental management programme or environmental management plan; or
 - c. as requested by the Minister.
- Regulation 56: Principles for mine closure: In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that -
 - (a) the closure of a prospecting or mining operation incorporates a process which must start at the commencement of the operation and continue throughout the life of the operation;
 - (b) risks pertaining to environmental impacts must be quantified and managed pro-actively, which includes the gathering of relevant information throughout the life of a prospecting or mining operation;
 - (c) the safety and health requirements in terms of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) are complied with;
 - (d) residual and possible latent environmental impacts are identified and quantified;
 - (e) the land is rehabilitated, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development; and
 - (f) prospecting or mining operations are closed efficiently and cost effectively.
- Regulation 61: Closure objectives- Closure objectives form part of the draft environmental management programme or environmental management plan, as the case may be, and must –
 - (a) identify the key objectives for mine closure to guide the project design, development and management of environmental impacts;
 - (b) provide broad future land use objective(s) for the site; and
 - (c) provide proposed closure costs.
- Regulation 62: Contents of closure plan: A closure plan contemplated in section 43(3)(d) of the Act, forms part of the environmental management programme or environmental management plan, as the case may be, and must include -
 - (a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting;
 - (b) a plan contemplated in regulation 2(2), showing the land or area under closure;
 - (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or environmental management plan, as the case may be;
 - (d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;
 - (e) a summary of the results of progressive rehabilitation undertaken;
 - (f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;
 - (g) details of any long-term management and maintenance expected;



- (h) details of a proposed closure cost and financial provision for monitoring, maintenance and post closure management;
- (i) a sketch plan drawn on an appropriate scale describing the final and future land use proposal and arrangements for the site;
- (j) a record of interested and affected persons consulted; and
- (k) technical appendices, if any.

3.4.1.3 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

Prior to 8th December 2014, the environmental aspects of prospecting activities were regulated in terms of the MPRDA. Recent legislative amendments and the drive towards a 'one environmental system' have resulted in the inclusion of the requirement for rehabilitation, decommissioning and closure planning and associated financial provisions into the NEMA. Specific sections of the act are extracted below:

- Section 24P: Financial provision for remediation of environmental damage:
 - 1) An applicant for an environmental authorisation relating to prospecting, exploration, mining or production must, before the Minister responsible for mineral resources issues the environmental authorisation, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts.
 - 2) If any holder or any holder of an old order right fails to rehabilitate or to manage any impact on the environment, or is unable to undertake such rehabilitation or to manage such impact, the Minister responsible for mineral resources may, upon written notice to such holder, use all or part of the financial provision contemplated in subsection (1) to rehabilitate or manage the environmental impact in question.
 - 3) Every holder must annually-
 - a. assess his or her environmental liability in a prescribed manner and must increase his or her financial provision to the satisfaction of the Minister responsible for mineral resources; and
 - b. submit an audit report to the Minister responsible for mineral resources on the adequacy of the financial provision from an independent auditor.
 - 4) (a) If the Minister responsible for mineral resources is not satisfied with the assessment and financial provision contemplated in this section, the Minister responsible for mineral resources may appoint an independent assessor to conduct the assessment and determine the financial provision. (b) Any cost in respect of such assessment must be borne by the holder in question.
 - 5) The requirement to maintain and retain the financial provision contemplated in this section remains in force notwithstanding the issuing of a closure certificate by the Minister responsible for mineral resources in terms of the Mineral and Petroleum Resources Development Act, 2002 to the holder or owner concerned and the Minister responsible for mineral resources may retain such portion of the financial provision as may be required to rehabilitate the closed mining or prospecting operation in respect of latent, residual or any other environmental impacts, including the pumping of polluted or extraneous water, for a prescribed period.
 - 6) The Insolvency Act, 1936 (Act No. 24 of 1936), does not apply to any form of financial provision contemplated in subsection (1) and all amounts arising from that provision.
 - 7) The Minister, or an MEC in concurrence with the Minister, may in writing make subsections (1) to (6) with the changes required by the context applicable to any other application in terms of this Act.
- Section 24R: Mine closure on environmental authorisation:
 - (1) Every holder, holder of an old order right and owner of works remain responsible for any environmental liability, pollution or ecological degradation, the pumping and treatment



of polluted or extraneous water, the management and sustainable closure thereof notwithstanding the issuing of a closure certificate by the Minister responsible for mineral resources in terms of the Mineral and Petroleum Resources Development Act, 2002, to the holder or owner concerned.

- (2) When the Minister responsible for mineral resources issues a closure certificate, he or she must return such portion of the financial provision contemplated in section 24P as the Minister may deem appropriate to the holder concerned, but may retain a portion of such financial provision referred to in subsection (1) for any latent, residual or any other environmental impact, including the pumping of polluted or extraneous water, for a prescribed period after issuing a closure certificate.
- (3) Every holder, holder of an old order right or owner of works must plan, manage and implement such procedures and requirements in respect of the closure of a mine as may be prescribed.
- (4) The Minister may, in consultation with the Minister responsible for mineral resources and by notice in the Gazette, identify areas where mines are interconnected or their impacts are integrated to such an extent that the interconnection results in a cumulative impact.
- (5) The Minister may, by notice in the Gazette, publish strategies in order to facilitate mine closure where mines are interconnected, have an integrated impact or pose a cumulative impact.

3.4.1.4 FINANCIAL PROVISIONING REGULATIONS

On 20th November 2015 the Minister promulgated the Financial Provisioning Regulations under the NEMA. The regulations aim to regulate the determine and making of financial provision as contemplated in the NEMA for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, inter alia:

- Determination of financial provision: An applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, exploration, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts.
- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:
 - Annual rehabilitation – annual rehabilitation plan
 - Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan; and
 - Remediation of latent and residual impacts – environmental risk assessment report.
- Regulation 10: An applicant must-
 - ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the Mineral and Petroleum Resources Development Act, 2002; and



- Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, exploration, mining or production operations.
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA regulations.

3.4.1.5 OTHER GUIDELINES

The following additional guidelines which relate to financial provisioning and closure have been published in the South African context:

- Best Practice Guideline G5: Water Management Aspects for Mine Closure: This guideline was prepared by the DWS and aims to provide a logical and clear process that can be applied by mines and the competent authorities to enable proper mine closure planning that meets the requirements of the relevant authorities. This guideline is aimed primarily at larger scale mines and does not specifically address closure issues related to closure of prospecting activities, however certain principles related to closure and water management are relevant. The following technical factors which should be considered during closure, and which are likely to relate to prospecting activities, have been considered:
 - Land use plan: directly interlinked with water management issues insofar as water is required to support the intended land use- in this regard the surrounding communities and the land uses implemented rely on available ground and surface water to be sustained. Management of water quality and quantity has been identified as an aspect to be covered in this FRDCP.
 - Public participation and consultation: consultation is fundamental to closure and there is a need for full involvement of stakeholders in the development of the final closure plans, and in the agreement of closure objectives- in this regard this FRDCP has been made available through the Basic Assessment public participation process for comment by relevant stakeholders.
- Guideline for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine: The objectives of the guideline include the need to improve the understanding of the financial and legal aspects pertaining to the costing of remediation measures as a result of mining activities. Whilst this guideline predates the recent NEMA Financial Provisioning Regulations, it does contain certain principles and concepts that remain valid and have been considered in this FRDCP.

3.4.2 CLOSURE VISION, OBJECTIVE AND TARGETS

The vision, and consequent objective and targets for rehabilitation, decommissioning and closure, aim to reflect the local environmental and socio-economic context of the project, and to represent both the corporate requirements and the stakeholder expectations.

The receiving environment within which the prospecting activities will be undertaken include the following key land-uses:

- Intensive agriculture;
- Mining and quarrying; and
- Industrial activities.

With reference to Section 3.1.3, the stakeholders will be consulted during the public participation process for the BAR and their comments relating to closure, decommissioning and rehabilitation will be considered in terms of this document.

With reference to both the environmental context of the project and the feedback from the consultation process the vision for closure is to: Ensure that the post closure land use aligns with the surrounding land-use and does not affect the sustained utilisation of the land.



In practice the post closure land-use will depend on the pre-prospecting land-use applicable to the specific location of the prospecting activities. This FRDCP aim to address the key closure objectives which are likely to remain consistent for the majority of the prospecting activities.

Driven by the closure vision and with due consideration of the project context the following closure objective are presented:

- Set the course for eventual ecosystem restoration, including the restoration of the natural vegetation community, hydrology, and wildlife habitats.
- Prevent future environmental issues related to prospecting areas.
- Protection of water resources.
- Ensure that land is usable, in alignment with surrounding land uses.

Please refer to Table 12 for the stipulated targets related to these closure objectives.

3.4.3 ALTERNATIVE CLOSURE AND POST CLOSURE OPTIONS

There are various alternative closure and post closure options available. The identification and consideration of the most suitable alternatives are driven by, inter alia the following considerations:

- The ability of the selected alternative to adequately meet the specified closure vision and objectives.
- The efficiency, viability, and practicality of the selected alternative.
- The alignment with the local environmental and socio-economic context and associated opportunities and constrains.

Table 13 presents some available options and alternatives related to the process of abandoning and closure of a prospecting site. This reassessment must be utilised to select the most appropriate and responsible closure option. The options in the table below that are marked with an “X” are considered the preferred options.

Table 13: Closure Alternatives

Prospecting Activity	Aspect	Options	Comment
Prospecting Boreholes	Closure	Yes	<p>The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the projects closure plan is defined and understood from before starting the process and is complementary to the rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project at hand and be aligned with the EMPr. The overall rehabilitation objectives for this project are as follows:</p> <p>Maintain and minimise impacts to the ecosystem within the study area;</p> <p>Re-establishment of the pre-developed land capability to allow for a suitable post- prospecting land use;</p> <p>Prevent soil, surface water and groundwater contamination;</p>



Prospecting Activity	Aspect	Options	Comment
			Comply with the relevant local and national regulatory requirements; and Maintain and monitor the rehabilitated areas.
		No	The option of not rehabilitating the prospected areas, leaving the risks such as contamination of watercourses, establishment and spread of alien vegetation, safety risk to humans and animals unmitigated.
	Surface Infrastructure	Complete removal	In order to allow unhindered land use of the prospecting area, it is suggested that all surface infrastructure be removed.
		Retain	Surface infrastructure would typically remain for possible future use by the landowner or the applicant.
	Access roads	Rehabilitate	The intention is to rehabilitate the area, including any additional access routes, to the pre- prospecting condition.
		Retain	In certain instances, the landowner may request the retention of the access route.

As mentioned previously the final closure and decommissioning of a prospecting site must be pre-empted by a site-specific assessment and where applicable the implementation of the most appropriate rehabilitation and closure strategy. Furthermore, the annual review of this FRDCP must where applicable include an assessment and adjustment of the closure strategy to reflect the most recent technical development and industry best practice, as well as any lessons learnt from the implementation of closure on this project.

3.4.4 MOTIVATION FOR PREFERRED CLOSURE OPTION

With reference to Sections 3.4.2 and 3.4.3, the preferred closure option is as follows:

- In line with the DWAF (2008). Best Practice Guideline A6: Water Management for Underground Mines, all prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers;
- In order to allow unhindered land use of the prospecting area, it is suggested that all surface infrastructure be removed; and
- Rehabilitate access routes.

It is anticipated that the closure option presented above, together with monitoring over a 2-year post closure period, will achieve the stipulated closure objective. This closure option is in line with industry best practice and the requirements of the MPRDA Regulations.

3.4.5 CLOSURE PERIOD AND POST CLOSURE REQUIREMENTS

The closure period is defined as the period between the cessation of prospecting activities, and the completion of active rehabilitation actions on the applicable site. It is important to note that the nature of prospecting drilling is such that closure may be implemented for individual boreholes as and when the analysis ends.

Following successful completion of the active closure actions it is suggested that a further post closure period be assigned to allow for monitoring of the success of closure. It is anticipated that a period of 2 years be permitted for ongoing post closure monitoring. This post closure monitoring will include the following:



- Inspection of borehole plug integrity; and
- Vegetation composition.

3.4.6 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to this FRDCP:

- The following assumptions have been made and used as the basis for the financial provision calculations:
 - Post closure land use to resemble the pre-prospecting land use and vegetative cover;
 - Depth per borehole: ~20m;
 - Distance of access track (requiring rehabilitation): ~
 - The additional access roads prepared for the prospecting activities will be rehabilitated during closure;
 - The closure actions and associated period will commence as soon as a borehole is abandoned; and
 - It is assumed that the entire length and diameter of the prospecting borehole will be plugged/ cemented.
- It is assumed that the management and mitigation measures suggested in the BAR relating to ongoing environmental management will be complied with. This includes post drilling clean-up and rehabilitation; and
- It is assumed that the drilling, will be carried out in accordance with industry best practice and that permeable zones are adequately isolated (including the usable ground water aquifers).

Final Post Prospecting Land use

As discussed above the final post closure land use will depend on the specific site circumstances. It is proposed that prior to initiating closure that a suitably qualified specialist is appointed to undertake an assessment and consult with the landowner and prepare a site-specific decommissioning plan for submission to DMRE for review and approval. For the purposes of this FRDCP it is assumed that the post closure land use will be agricultural land.

3.5 CLOSURE ACTIONS

3.5.1 INTEGRATED REHABILITATION AND CLOSURE PLAN

The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the project's closure plan is defined and understood before starting the process and is complementary to the rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project at hand and be aligned with the EMP. The overall rehabilitation objectives for this project are as follows:

- Maintain and minimise impacts to the ecosystem within the study area;
- Re-establishment of the pre-developed land capability to allow for a suitable post- prospecting land use;
- Prevent soil, surface water and groundwater contamination;
- Comply with the relevant local and national regulatory requirements; and



- Maintain and monitor the rehabilitated areas.

Successful rehabilitation must be sustainable, and requires an understanding of the basic baseline environment, as well as project management to ensure that the rehabilitation program is a success.

It is noted that an application for environmental authorisation must be submitted for closure in accordance with Activity 22 Listing Notice 1:

The decommissioning of any activity requiring –

- (i) a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or
- (ii) A prospecting right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.

3.5.2 PHASE 1: MAKING SAFE

In line with the DWAF (2008). Best Practice Guideline A6: Water Management for Underground Mines. All prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers. Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. As a result, the contractor shall ensure that:

- Concrete shall not be mixed directly on the ground;
- The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste, (Washing of visible signs into the ground is not acceptable); and
- All excess aggregate shall also be removed.

3.5.3 PHASE 2: LANDFORM DESIGN, EROSION CONTROL AND REVEGETATION

Landform, erosion control and re-vegetation is an important part of the rehabilitation process. Landform and land use are closely interrelated, and the landform should be returned as closely as possible to the original landform. Community expectations, compatibility with local land use practices and regional infrastructure, or the need to replace natural ecosystems and faunal habitats all support returning the land as closely as possible to its original appearance and productive capacity. This requires the following:

- Shape, level and de-compact (where necessary) the final landscape after removing all the project infrastructure, dress with topsoil and, where necessary, vegetate with indigenous species. Commission specialists to assist in planning re-vegetation and the management of environmental impact, as required.
- Remove access roads with no beneficial re-use potential by deep ripping, shaping and levelling after the removal and disposal of any culverts, drains, ditches and/or other infrastructure. Natural drainage patterns are to be reinstated as closely as possible.
- Promote re-vegetation through the encouragement of the natural process of secondary succession.
- Natural re-vegetation is dependent on de-compaction of subsoils and adequate replacement of the accumulated reserves of topsoil (for example, over the borehole sites), so as to encourage the establishment of pioneer vegetation.
- Remove alien and/or exotic vegetation.
- Undertake a seeding programme only where necessary, and as agreed with the re-vegetation specialist.



3.5.4 PHASE 3: MONITORING AND MAINTENANCE

The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of two (2) year unless otherwise specified by the competent authority.

The monitoring activities during this period will include but not be limited to:

- Biodiversity monitoring; and
- Re-vegetation of disturbed areas where required.

Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.

3.5.5 POST-CLOSURE MONITORING AND MAINTENANCE

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the relevant authority for approval, as a part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of the prospecting sites and related activities. It is recommended that the post-closure monitoring include the following:

- Confirmation that any waste, wastewater or other pollutants that is generated as a result of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan;
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning;
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established.
- ‘Acceptable cover’ means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants; and
- Confirmation that the prospecting borehole sites are safe and are not resulting in a pollution hazard.

Annual environmental reports will be submitted to the Designated Authority and other relevant Departments for at least one-year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority.

The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed and free condition.

3.6 FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE SCHEDULE

Table 14 below presents the forecast Schedule of actions related to the final rehabilitation, decommissioning and closure, in relation to the overall forecast prospecting schedule. It should be noted that this schedule represents a cautious approach and therefore doesn't take into consideration the recommendation that final rehabilitation, decommissioning and closure may be initiated earlier in the prospecting process for individual borehole sites.



Table 14: Timeframes each of the proposed activities

Phase	Activity	Year 1	Year 2	Year 3
Phase 1 (Month 0-12)	Non-Invasive Prospecting Geophysical Survey, Field surveys, Literature Studies, Obtaining historical borehole and trenching data and resource information			
Phase 2 (Month 12-24)	Invasive Prospecting Infill Drilling and Lab Analysis of cores/samples.		X	
Phase 3 (Month 24-36)	Non-Invasive Prospecting Analytical Desktop and Feasibility Studies			

3.7 ORGANISATIONAL CAPACITY

Capacity of the following key roles and responsibilities must be provided for:

- **The Applicant:** The applicant is ultimately responsible for ensuring compliance with all the provisions of the prospecting right and associated plans, as well as other relevant legal requirements. The Applicant must ensure knowledge and understanding of the applicable legislation, guidelines and industry best practices. Where necessary the applicant must appoint suitably qualified specialists, engineers, and other internal and external resources to adequately comply with the applicable commitments and requirements. Relevant commitments made and obligations contained within the legal requirements must be adequately planned and budgeted for. The applicant must also ensure that suitable structures are put in place to effectively communicate with the affected landowners and relevant stakeholders.
- **Independent Environmental Assessment Practitioner:** This individual will be appointed to ensure compliance with the requirements of the FRDCP and specifically to undertake the following tasks:
 - Undertake the required pre-closure environmental site assessment, risk assessment, and landowner consultations.
 - Prepare a site specific final closure and decommissioning plan.
 - Undertake the required periodic compliance monitoring and reporting during the closure period.
- **Prospecting specialist:** This individual must be a suitably qualified professional who must have relevant experience in prospecting. Key attributes must include experience and qualifications related to the technologies applicable to prospecting site closure, as well as a thorough understanding of internationally accepted closure standards and guidelines. This specialist will be responsible for ensuring that the closure plan is implemented to ensure that the risks to the environment and surrounding communities are prevented or limited.

Further education, training and capacity building is critical to ensure that the prospecting activities align with evolving internally accepted best practice and research. In this regard the Applicant must ensure that regular



review of international best practice is undertaken and where applicable implemented throughout the prospecting programme.

3.8 IDENTIFICATION OF CLOSURE PLAN GAPS

The key gaps applicable to this closure plan are as follows:

- The geological stratigraphy and nature of the borehole profiles is unknown. The specific geological stratigraphy will be a determining factor in the planning for closure and decommissioning.
- The impact that any existing boreholes may have on the receiving environment is unknown.

The following actions have been proposed to address these gaps:

- A detailed drilling log will be prepared and maintained for each of the boreholes to ensure that the specific geological stratigraphy and sub-surface conditions are considered and inform the final site specific closure and decommissioning plan.
- A site specific closure and decommissioning plan will be prepared for each invasive activities and will where applicable be informed by a specialist environmental site assessment, and risk assessment, as well as a specialist assessment and plan for borehole plugging and decommissioning.

Furthermore, the financial provisioning regulations requires that the FRDCP be revisited, assessed, and revised on an annual basis. This annual review must aim to ensure that the gaps identified above are addressed, as applicable, and the relevant financial provisioning updated.

3.9 RELINQUISHMENT CRITERIA

Relinquishment can be defined as the formal approval by the relevant regulating authority indicating that the completion criteria for the prospecting activity have been met to the satisfaction of the authority. In this regard the relinquishment criteria are driven by the objectives of closure and consequently the indicators applicable to each impact associated with the closure and decommissioning of the prospecting boreholes. In this regard reference is made to Table 12 which presents each identified environmental impact, the associated indicators and proposed closure targets. In summary the proposed relinquishment criteria include:

- Biodiversity and soils: The vegetation cover of the affected areas must be consistent with surrounding vegetative cover. There must be ecosystem functionality which is consistent with the surroundings. There must be no faunal mortalities associated with the prospecting activities.
- Social: There must be no unattended complaints. Where possible written confirmation from the affected landowner must be solicited confirming that outstanding issues have been addressed and closed out.
- Waste: There must be no waste materials remaining on site.

3.10 CLOSURE COST - FRDCP

At any time funds must be available for the amount of 10 years of the calculation of the sum of the rehabilitation calculation. The remainder of this section provides details on the proposed closure cost. The assumptions and limitations stated in Section 3.4.6 and Section 3.10.3, also underpin the basis of this closure cost determination.

3.10.1 CLOSURE COST METHODOLOGY

The closure cost has been calculated through the following steps:

- Applicable prospecting activities are listed;
- Applicable closure actions listed for each activity;
- Cost items are listed for each action;



- Cost units and rates determined for each item (where possible on the basis of actual quotations); and
- Total cost is calculated.

3.10.2 CLOSURE COST ESTIMATION

This closure cost is based on 2020 values and will require annual reassessment, revision and escalation. The preliminary estimate of the Rehabilitation Cost is (inclusive of contingencies and VAT): R 162 837.13. Please refer to Appendix A for the detailed breakdown of the anticipated closure cost for 58 boreholes.

3.10.3 CLOSURE COST ASSUMPTIONS AND LIMITATIONS

In accordance with the prospecting activities description, the following activities are included, and their associated cost assumptions:

- The following assumptions have been made and used as the basis for the financial provision calculations:
 - Post closure land use to resemble the pre-prospecting land use and vegetative cover;
 - Depth per borehole: ~20m;
 - Distance of access track (requiring rehabilitation): ~5 000 m total;
 - The access roads prepared for the prospecting activities will be rehabilitated during closure;
 - The closure actions and associated period will commence as soon as a borehole is abandoned; and
 - It is assumed that the entire length and diameter of the prospecting borehole will be plugged/ cemented.
- It is assumed that the management and mitigation measures suggested in the BAR relating to ongoing environmental management will be complied with. This includes post drilling clean-up and rehabilitation; and
- It is assumed that the drilling, will be carried out in accordance with industry best practice and that permeable zones are adequately isolated (including the usable ground water aquifers).

3.11 MONITORING, AUDITING AND REPORTING

The requirement to monitor and audit should be carried through all phases of the proposed prospecting activities. In this regard the following monitoring and auditing requirements for the pre-closure phases have been specified in the BAR and EMPr (please refer to the BAR and EMPr for further detail):

- Compliance monitoring and auditing:
 - In accordance with Regulation 26 of the NEMA EIA regulations the competent authority will indicate the extent and frequency of required environmental audits in any consequent environmental authorisations. For the purposes of this submission the following is proposed:
 - The Site Manager (normally the Project Geologist) will be responsible for daily monitoring, culminating in weekly reports which will be filed in support of an overall monthly report, which is to be submitted to the Nimbargo Resources Pty. Ltd Environmental Officer. Compliance with the BAR & EMPr will be audited quarterly by the Nimbargo Resources Pty. Ltd Environmental Officer. The officer will be responsible for quarterly site inspections and reports, culminating in the compilation of the annual performance assessment report which is to be submitted to the DMR, as per legal requirement. The results of these inspections will be documented and kept on record for the life of the prospecting operation. External audits in the form



of EMP performance assessments will be conducted every two years by an independent consultant and submitted to the DMR.

- Environmental Monitoring (as detailed in the BAR and EMPr):
 - Waste Management; and
 - Progressive rehabilitation.
- Review and update of Final Rehabilitation, Decommissioning and Closure Plan:
 - In accordance with Regulation 11 of the NEMA Financial Provisioning Regulations the Applicant must ensure annual review of the annual rehabilitation plan, the final rehabilitation decommissioning and closure plan, as well as the environmental risk assessment. This annual review must be audited by an independent auditor.

It is critical to continue monitoring through to the post- closure phase of the prospecting activities. The aim of this being to ensure that the objectives of the rehabilitation and closure plan are met. In this regard the following actions, to be adjusted based on the completion of the pre-closure site assessment, are proposed:

- Compliance monitoring and auditing: Annual (or as agreed) environmental reports will be submitted to the competent authority and other relevant stakeholders for at least 2 years post-decommissioning. The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed free condition.
- Environmental Monitoring:
 - Flora: Biodiversity assessments mid wet season should be undertaken by the ECO to monitor the rehabilitation progress with regards to flora. Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants.

4 ANNUAL REHABILITATION PLAN

The annual rehabilitation plan aims to:

- a. review concurrent rehabilitation and remediation activities already implemented;
- b. establish rehabilitation and remediation goals and outcomes for the forthcoming 12 months, which contribute to the gradual achievement of the post-prospecting land use, closure vision and objectives identified in the holder's final rehabilitation, decommissioning and mine closure plan;
- c. establish a plan, schedule and budget for rehabilitation for the forthcoming 12 months;
- d. identify and address shortcomings experienced in the preceding 12 months of rehabilitation; and
- e. evaluate and update the cost of rehabilitation for the 12 month period and for closure, for purposes of supplementing the financial provision guarantee or other financial provision instrument.

5 ENVIRONMENTAL RISK ASSESSMENT – LATENT AND RESIDUAL ENVIRONMENTAL IMPACTS

According to the Financial Provisioning Regulations (2015) the objective of the environmental risk assessment report that relates to latent and residual impacts is to:

- a. ensure timeous risk reduction through appropriate interventions;
- b. identify and quantify the potential latent environmental risks related to post closure;



- c. detail the approach to managing the risks;
- d. quantify the potential liabilities associated with the management of the risks; and
- e. outline monitoring, auditing and reporting requirements.

This section of the report aims to address these objectives separately in cases where they have not been considered in previous sections.

5.1 THE ASSESSMENT PROCESS USED AND DESCRIPTION OF LATENT ENVIRONMENTAL RISK

Section 7 of the BAR provides a detailed description of the environmental impact/risk identification and assessment (including the methodology and findings) undertaken for the proposed prospecting activities. Further details of the risk assessment methodology are detailed in the Environmental Risk Assessment under Section 3.2 of this report. As mentioned under Section 3.2, the BAR and EMPr have identified mitigation measures which, once implemented successfully, will result in the avoidance or acceptable reduction of the associated impact.

The drivers that could result in the manifestation of the latent risk are largely defined by the specifics of the site location and the geological profile surrounding each specific site. It is suggested that further investigations are conducted during annual revisions, as well as during the proposed site specific environmental assessment detailed in Section 3.8 of this document to provide more clarity on this specific issue. These investigations must include regular revision of the environmental risk assessment and consequently inform the responsible management of latent and residual impacts.

5.2 MANAGEMENT ACTIVITIES, COSTING AND MONITORING REQUIREMENTS

New international best practice guidelines that may be developed in the future (Section 3.4.3), will be considered in all annual updates of the financial provisions and changes to the risk assessment will be reported on. In addition, monitoring results and auditing reports, as described under Section 3.5.3, for two years after closure will inform the revised risk assessment further.

Appendix A

Cost Estimate



Item #	Activity	Item	Type	Cost Item	Comments	Number	Unit Price	Cost (Excl VAT)
1	Phase 1: Preparation for closure	Environmental Site Inspection and assessment	Work	Environmental Officer	Hours	50	R 500.00	R 25 000.00
			Material	Mileage	km	150	R 5.50	R 825.00
2	Phase 2: Closure and rehabilitation	Borehole Surface Rehabilitation	Material	Groundworks (shaping) & Rehabilitation	Shaping and rehabilitation of 75% of all boreholes (58 in total)	43.5	R 1 500.00	R 65 250.00
3	Phase 3: Monitoring, Maintenance and Relinquishment	Vegetation monitoring	Work	Specialist: Ecology	SACNASP registered ecologist/ botanist. Survey undertaken once per annum	48	R 750.00	R 36 000.00
			Material	Mileage	2 Return trips to site.	300	R 5.50	R 1 650.00
Professional Fees								R 61 000.00
Expenses								R 67 725.00
TOTAL COST (EXCL VAT)								R 128 725.00
TOTAL COST + 10% CONTINGENCY (EXCL VAT)								R 141 597.50
TOTAL COST + 10% CONTINGENCY (INCL VAT)								R 162 837.13