



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: NTSIKA MINING ADVISORY (PTY) LTD

REFERENCE NUMBER: GP30/5/1/1/2/10304PR

ENVIRONMENTAL MANAGEMENT PLAN

SUBMITTED

**IN TERMS OF SECTION 39 AND OF REGULATION 52 OF THE
MINERAL AND PETROLEUM RESOURCES DEVELOPMENT
ACT, 2002, (ACT NO. 28 OF 2002) (the Act)**

STANDARD DIRECTIVE

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED.

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LIST OF ABBREVIATIONS

AIA	Archaeological Impact Assessment
BID	Background Information Document
CSA	Constitution of South Africa (Act No. 108 of 1996)
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism (currently known as DEA)
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
GN	Government Notice
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IWUL	Integrated Water Use License
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
DEDET	Department of Economic Development, Environment and Tourism
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SR	Scoping Report

GLOSSARY OF TERMS

Anthropogenic: Change induced by human intervention.

Applicant: Any person who applies for an authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment (EIA) Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] as contemplated in the scheduled activities listed in Government Notice (GN) No 543, 544 and 545.

Archaeological resources: This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which South African Heritage Resources Agency (SAHRA) considers to be worthy of conservation; features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Alluvial: Resulting from the action of rivers, whereby sedimentary deposits are laid down in river channels, floodplains, lakes, depressions etc.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Cultural significance: This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Environment: All physical, chemical and biological factors and conditions that influence an object.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an EIA and follows on from the Scoping Report (SR).

1. INTRODUCTION

1.1 Project Background

The Applicant, Ntsika Mining Advisory (Pty) Ltd (Ntsika Mining), requested MEAHC Environmental AND Heritage Consultants (Pty) Ltd to undertake an application for Environmental Management Programme for the proposed establishment of Strontium (Sr), Rutile (Heavy Mineral) (Rt), Monazite (Heavy Mineral) (Mz), Heavy Minerals (General) (HM), Leucoxene (Heavy Mineral) (Lx), Uranium Ore (U), Chrysoberyl (Gemstone) (GCb), Diamond (DIA), Coal (C), Stone Aggregate; Gravel (St), Sulphur (In Pyrite) (Spy), Fluorspar (F), Platinum Group Metals (PGM), Gold Ore (Au), Silver Ore (Ag), Chrome Ore (Cr), Copper Ore (Cu), Cobalt (Co), Nickel Ore (Ni), Vanadium Ore (V) and Iron Ore (Fe) prospecting programme on the farms Klipfontein 268 JR (excluding portion 1), the farm Honingnestkrans 269 JR, the farm Haakdoornboom 267 JR, portion 3, 5, 6 and the remaining extent of the farm Westzelrust 223 JR, the farm De Onderstepoort 300 JR (Excluding 10, 45, 73, 75, 76, 77, 78, 82, 83, 86, 87, 88, 100, 101, 102, 103, 104, 105, 138, 139, 140, 142 and 100 of the farm De Onderstepoort 300 JR) in the Pretoria District, Gauteng Province. The application is lodged in terms of the National Environmental Management Act, 1998 (Act 108 of 1998) (as amended) [NEMA] at the competent authority namely the Department of Local Economic Development, Environment and Tourism (LDEDET). The application is required since the proposed development includes activities which are listed in terms of the NEMA Environmental Impact Assessment (EIA) Regulations 2010.

MEAHC Environmental and Heritage Consultants (Pty) Limited [MEAHC], as an environmental consultant, has been appointed by the Applicant, to undertake the Environmental Management Programme for the proposed prospecting of Strontium (Sr), Rutile (Heavy Mineral) (Rt), Monazite (Heavy Mineral) (Mz), Heavy Minerals (General) (HM), Leucoxene (Heavy Mineral) (Lx), Uranium Ore (U), Chrysoberyl (Gemstone) (GCb), Diamond (DIA), Coal (C), Stone Aggregate; Gravel (St), Sulphur (In Pyrite) (Spy), Fluorspar (F), Platinum Group Metals (PGM), Gold Ore (Au), Silver Ore (Ag), Chrome Ore (Cr), Copper Ore (Cu), Cobalt (Co), Nickel Ore (Ni), Vanadium Ore (V) and Iron Ore (Fe) Prospecting will take place on the farms Klipfontein 268 JR (excluding portion 1), the farm Honingnestkrans 269 JR, the farm Haakdoornboom 267 JR, portion 3, 5, 6 and the remaining extent of the farm Westzelrust 223 JR, the farm De Onderstepoort 300 JR (Excluding 10, 45, 73, 75, 76, 77, 78, 82, 83, 86, 87, 88, 100, 101, 102, 103, 104, 105, 138, 139, 140, 142 and 100 of the farm De Onderstepoort 300 JR) in the Pretoria Magisterial District, Gauteng Province. The site is disturbed by previous mining activities and mining activities which is currently taking place. Because of the anthropogenic influences in the area it is highly unlikely

that any cultural effects of high, medium or low significance are existent within the development footprint area.

Strontium (Sr), Rutile (Heavy Mineral) (Rt), Monazite (Heavy Mineral) (Mz), Heavy Minerals (General) (HM), Leucoxene (Heavy Mineral) (Lx), Uranium Ore (U), Chrysoberyl (Gemstone) (GCb), Diamond (DIA), Coal (C), Stone Aggregate; Gravel (St), Sulphur (In Pyrite) (Spy), Fluorspar (F), Platinum Group Metals (PGM), Gold Ore (Au), Silver Ore (Ag), Chrome Ore (Cr), Copper Ore (Cu), Cobalt (Co), Nickel Ore (Ni), Vanadium Ore (V) and Iron Ore (Fe) are a basic material that are needed additives for the manufacturing of steel. The area has been identified as containing significant platinum group metals and base metals resources. The total area that has been applied for is 6,343.592886 hectares. All of the proposed prospecting areas have been previously used as pasture land for cattle, certain sections of the site has been left for pasture land for cattle grazing.

A structured method of prospecting and concurrent rehabilitation is planned. Rehabilitation will start immediately when prospecting has been completed on each prospecting site. The area will be levelled and sloped and the topsoil will be replaced. The rehabilitated area will be ploughed and a cover crop established to stabilise the soil and protect it from erosion. The planned end use of the land is to rehabilitate it so that it can continue being used for agriculture and as pasture land.

In terms of surrounding land use the area is predominately characterised by agriculture, mostly stock farming but also with maize and other arable crops grown. However most of areas are vacant land and a few other mining activities in the greater area. The economy of the area is thus mainly driven by agriculture, in terms of socio-economics. The current land use offers very little job opportunities to the community.

The applicant is applying for the authorisation of the proposed Strontium (Sr), Rutile (Heavy Mineral) (Rt), Monazite (Heavy Mineral) (Mz), Heavy Minerals (General) (HM), Leucoxene (Heavy Mineral) (Lx), Uranium Ore (U), Chrysoberyl (Gemstone) (GCb), Diamond (DIA), Coal (C), Stone Aggregate; Gravel (St), Sulphur (In Pyrite) (Spy), Fluorspar (F), Platinum Group Metals (PGM), Gold Ore (Au), Silver Ore (Ag), Chrome Ore (Cr), Copper Ore (Cu), Cobalt (Co), Nickel Ore (Ni), Vanadium Ore (V) and Iron Ore (Fe) in terms of the EIA Regulations of 2010 (Government Notice No's R543, 544 and 545 in Government Gazette No. 33306 of 18 June 2010). The proposed project includes a listed activity which falls within the scheduled activities listed in Government Notice Regulation No 545 (Scoping and EIA). Prior to such a listed activity being approved, it is required that an environmental process is undertaken and a report be submitted to the relevant environmental authority for consideration.

The Draft EMP process includes the completion of an Environmental Management Plan Programme (EMP). The Draft EMP will determine the issues or concerns from the relevant authorities as well as Interested and Affected Parties (I&APs). The Environmental Management Programme will be undertaken to determine the likely consequence that the proposed prospecting programme may have on the environment.

The total area applied for measures approximately 6,343.592886 Hectares. The Regulation 2(2) Plan indicating the area applied for is attached as Annexure I to this document.

DMR Guideline Document

- 1.1 Describe the environment on site relative to the environment in the surrounding area.
- 1.2 Describe the specific environmental features on the site applied for which may require protection, remediation, management or avoidance.
- 1.3 Include a map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.
- 1.4 Confirm specifically in this section whether or not the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties,
- 1.5 If the description of the environment has not been compiled with the participation of any of the community, the landowner or interested and affected parties, a detailed explanation must be provided why not and how description of the baseline environment was arrived at if the landowner did not afford access thereto

1 REGULATION 52 (2): Description of the environment likely to be affected by the proposed prospecting or mining operation

The site is surrounded by a mixture of land uses, predominantly vacant and cultivated land parcels with a few mining activities (proposed, current, and post mining). Agricultural land is located directly adjacent to the south, east and western boundary of the site. There are several towns in close proximity to the proposed prospecting, including Waterval, Rosslyn, Doornpoort, Pretoria and Ga-Rankuwa. Mining areas are located in the south eastern and northern regions, while agricultural land can be found in the eastern and western regions.

According to the recorded observations and discussions with landowners who have been in the area for many years, there has been some form of cultivation on the land for crop production or for the provision of grazing in the recent past. The land has been also used for grazing purposes many years ago on a rather small scale.

The historical land use of the site and the surrounding farms was agriculture (crop farming and grazing), however other mines (platinum mines) do occur within 40km radius from the site. A limited amount of exploration boreholes are currently on site. Table 2 below describes historic, current and possible future land use in detail. It also describes the interaction between land uses in different chronological and spatial contexts. It can be concluded from the table that the proposed land use does not hold any environmental threat since no land contamination occurred and no abnormal erosion resulted, etc. It can also be concluded that current land uses are compatible with current surrounding land use and with planned future land use (if specifications in the Environmental Management Programme [EMP] are adhered to).

Table 1: Comparison of historic, current and future land uses

	THE SITE – area(s) directly or indirectly affected by prospecting/mining and associated operations	THE REST OF THE PROPERTY – area(s) not affected by prospecting/mining and associated operations at all	THE SURROUNDING PROPERTIES
HISTORIC LAND USE			
<i>Description of historic land use</i>	<i>Agriculture: crop farming and grazing.</i>	<i>Agriculture: crop farming and grazing.</i>	<i>Agriculture: mainly crop farming and mining of sand, aggregate stone, precious metals and base metals</i>
Potential risks that historic land use may pose to current land use	None	None	None
Potential risks that historic land use may pose to proposed post-closure land use	None	None	None
CURRENT LAND USE			
<i>Description of current land use</i>	<i>Prospecting area for pgm and associated minerals</i>	<i>Agriculture: crop farming and grazing.</i>	<i>Crop farming, mining of sand, aggregate stone, precious metals and base metals</i>
Potential risks that the current land use may pose to surrounding current land use	Dust pollution, traffic impacts, noise and aesthetic impact.	Dust pollution, traffic impacts noise and aesthetic impact.	Dust pollution, traffic impacts noise and aesthetic impact.
FUTURE LAND USE			
<i>Description of planned AND probable / proposed future / post-closure land use</i>	<i>Farming activities such as grazing</i>	<i>Farming activities such as grazing</i>	<i>Farming activities, mainly crop farming</i>
Potential risks that the current land use may pose to proposed post-closure land use	The prospecting area, if not rehabilitated properly, may reduce future land capability for residential and or resort development.	The prospecting area, if not rehabilitated properly, may reduce the visual attractiveness of the area	The prospecting area, if not rehabilitated properly, may become a source of dust pollution to the area
Potential risks that the proposed post-closure land use may pose to surrounding future land use	Proper and sufficient sanitation, water supply, storm water control and other services need to be provided to prevent potential risks to future land uses on site.	Proper and sufficient sanitation, water supply, storm water control and other services need to be provided to prevent potential risks to future land uses on site	Proper and sufficient sanitation, water supply, storm water control and other services need to be provided to prevent potential risks to future land uses in the surrounding area

1.1 The environment on site relative to the environment in the surrounding area.

The farms under the administration of the Tshwane Metro Municipality and the private farmers, surrounds the proposed prospecting area (Table 1.1).

Hunting, subsistence agriculture and stock farming were for decades the primary economic activities of the local communities. Agricultural lands already existed before the second half of the 20th century on the farm Wonderboom. The land tenure system (with Permission to Occupy from the private farmers) is the prevailing practice on the surrounding farms.

A large percentage of the de facto available labour force in the immediate project area is involved in subsistence agriculture and informal sector activities. Participation of the local population in the formal economy is mostly as farm labourers (especially to the northwest of the study area on the old Pretoria road) and employment on various mines in the area (mainly pgm, sand and granite). The farm shows to have previous and mining activities taking place. Very Little environmental impact will be affected.

The proposed prospecting area is to be conducted on the farms Strontium (Sr), Rutile (Heavy Mineral) (Rt), Monazite (Heavy Mineral) (Mz), Heavy Minerals (General) (HM), Leucosene (Heavy Mineral) (Lx), Uranium Ore (U), Chrysoberyl (Gemstone) (GCb), Diamond (DIA), Coal (C), Stone Aggregate, Gravel (St), Sulphur (In Pyrite) (Spy), Fluorspar (F), Platinum Group Metals (PGM), Gold Ore (Au), Silver Ore (Ag), Chrome Ore (Cr), Copper Ore (Cu), Cobalt (Co), Nickel Ore (Ni), Vanadium Ore (V) and Iron Ore (Fe) Prospecting will take place on the farms Klipfontein 268 JR (excluding portion 1), the farm Honingnestkrans 269 JR, the farm Haakdoornboom 267 JR, portion 3, 5, 6 and the remaining extent of the farm Westzelrust 223 JR, the farm De Onderstepoort 300 JR (Excluding 10, 45, 73, 75, 76, 77, 78, 82, 83, 86, 87, 88, 100, 101, 102, 103, 104, 105, 138, 139, 140, 142 and 100 of the farm De Onderstepoort 300 JR), situated approximately 15 km north of town of Pretoria with centre coordinates Longitude 28°9'12.427"E & Latitude 25°34'29.326"S situated in the Magisterial District of Pretoria.

North of the site is the Odi Aerodrome that is no longer used as an airport. The study area is considered to be highly desirable for the establishment of a PGM and Associated Base Metals based on several key factors such as the Bushveld Igneous Complex resource, climatic conditions, extent of the site, orographic conditions and availability of land.

There is various quarry mines which are situated on the farms De Onderstepoort 300 JR, Doornpoort 295 JR and south of the farm of on Klipfontein 268 JR. The George Mukhari Provincial Hospital and the University of Limpopo (previously known as Medunsa University) are situated in the North West Province, south west of the proposed prospecting area. The area is

highly affected by the current and historical prospecting activities. There are servitudes like water, electricity and access roads within and around the farms.

The N1 Highway is located east of the area of the prospecting area in question. To the immediate south is the N4 Highway which connects Rustenburg with the town of Middleburg, the settlements which is situated directly to the prospecting area are Amalinda, Honingnestkranz, Bon Accord, Klipfontein, Kruisfontein, Iswelethu, Rosslyn, Onderstepoort, Soshanguve A, Soshanguve XX, Soshanguve WW and Soshanguve South. Evidence of current and historic mining is visible within the proposed prospecting area and also adjacent to the proposed prospecting area. Other servitudes exist within the area and relates to water and electricity supply as well as road infrastructure.

1.1.1. Location

The prospecting area is located on the Northern Sector of the Bushveld Igneous complex ("BIC") with respective distances to major towns and communities displayed in table form below. The proposed property area falls within the jurisdiction of the City of Tshwane Local Municipality. The affected communities are Amalinda, Honingnestkranz, Bon Accord, Klipfontein, Kruisfontein, Iswelethu, Rosslyn, Onderstepoort, Soshanguve A, Soshanguve XX, Soshanguve WW and Soshanguve South.

The total area applied for measures approximately 6,343.592886 hectares. The Regulation 2(2) Plan indicating the area applied for is attached to this document.

Specifically the prospecting area is west of the N1 highway. The town of Pretoria is situated to the south of the prospecting area. Neighbouring towns of Waterval, Doornpoort, Pretoria and Ga-Rankuwa borders the prospecting area to the east, west and south respectively. The town of Pretoria is situated to the south of the prospecting area.

The Apies River flows through the prospecting area in a north-westerly direction.

The communities that are located within a 5 km radius from the proposed prospecting site are: Amalinda, Honingnestkranz, Bon Accord, Klipfontein, Kruisfontein, Iswelethu, Rosslyn, Onderstepoort, Soshanguve A, Soshanguve XX, Soshanguve WW and Soshanguve South.

Table 2: Location of neighbouring towns/communities with respect to the prospecting site (Measured from the border of the prospecting site to the closest community/village centre).

Town/Community	Distance (km)	Direction From Project
Soshanguve South	Borders	North
Soshanguve East	Borders	North and West
Soshanguve A	Borders	East
Onderstepoort	Borders	East
Montana and Doornpoort	5 km	South and East
Ga-Rankuwa Unit 2	1.5 km	West
Ga-Rankuwa Unit 3	2.5 km	West
Ga-Rankuwa Unit 6	1 km	West
Ga-Rankuwa Unit 7	2 km	North-West

Geology

The area to be targeted for prospecting forms part of the Bushveld Igneous Complex (“BIC”). The Merensky Reef at the adjacent Eland Platinum Mine is known to be a low-grade unit and is at present deemed to be marginal.

Additional potential at the Klipfontein Project exists in the form of PGE mineralisation in the Main Zone. The mineralised horizon (termed “New Reef” for the purposes of this report) is not located in the Critical Zone (where the Merensky Reef and UG2 are located) but rather occurs as a PGE-enriched layer in the Main Zone. The New Reef horizon has been recognised in five drill holes drilled by previous companies, approximately 400 m stratigraphically above the UG2 in this area. According to previously examined available drill hole logs for the 2011 drilling, and the following observations summarised opinion of the New Reef mineralisation:-

- Mineralisation occurs approximately 400 m above the UG2 in poikilitic anorthosite of the Main Zone;
- The mineralisation appears to occur over a total width of approximately 5 m, with a bimodal distribution of 2PGE+Au grade. The mineralised intersection appears to be both top and bottom loaded with respect to PGE concentrations, with a low grade/un-mineralised central portion (see Figures 1, 2 & 3);
- Based on the available drill hole data, the average prill split ratio for the New Reef at the Klipfontein Project Area is 17:77:6 (Pt:Pd:Au); and
- The mineralised intersection is significantly higher in Pd (Palladium) than Pt (Platinum), which is opposite to the prill split ratio of the Merensky Reef and higher than the UG2 in the western limb of the BIC (typically, Pt concentration is higher than Pd concentration). The Chromitite Layer is the optional chromitite layer that is significantly exploited for PGE at present.

Figure 1: Typical prospecting drill site.

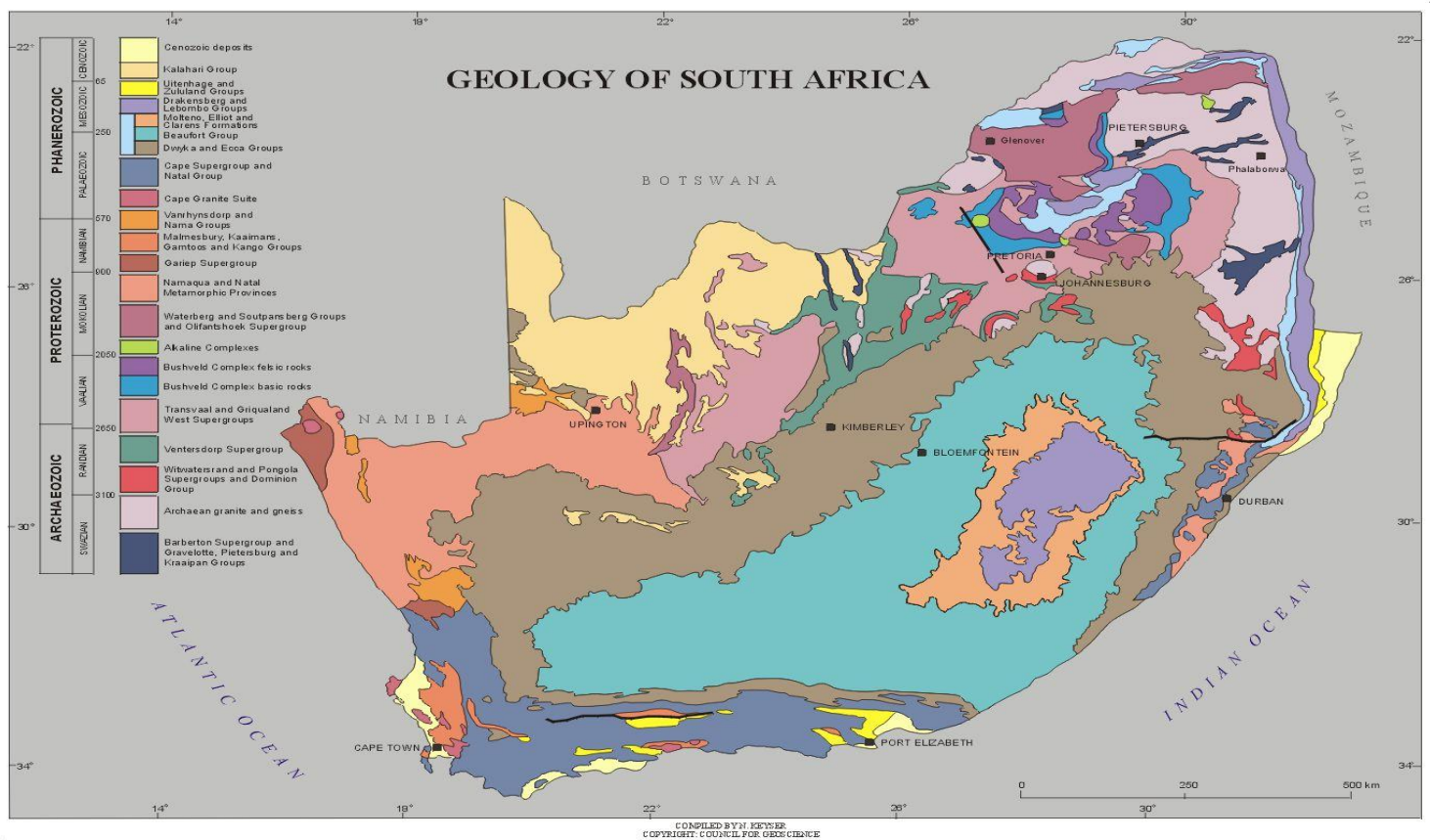
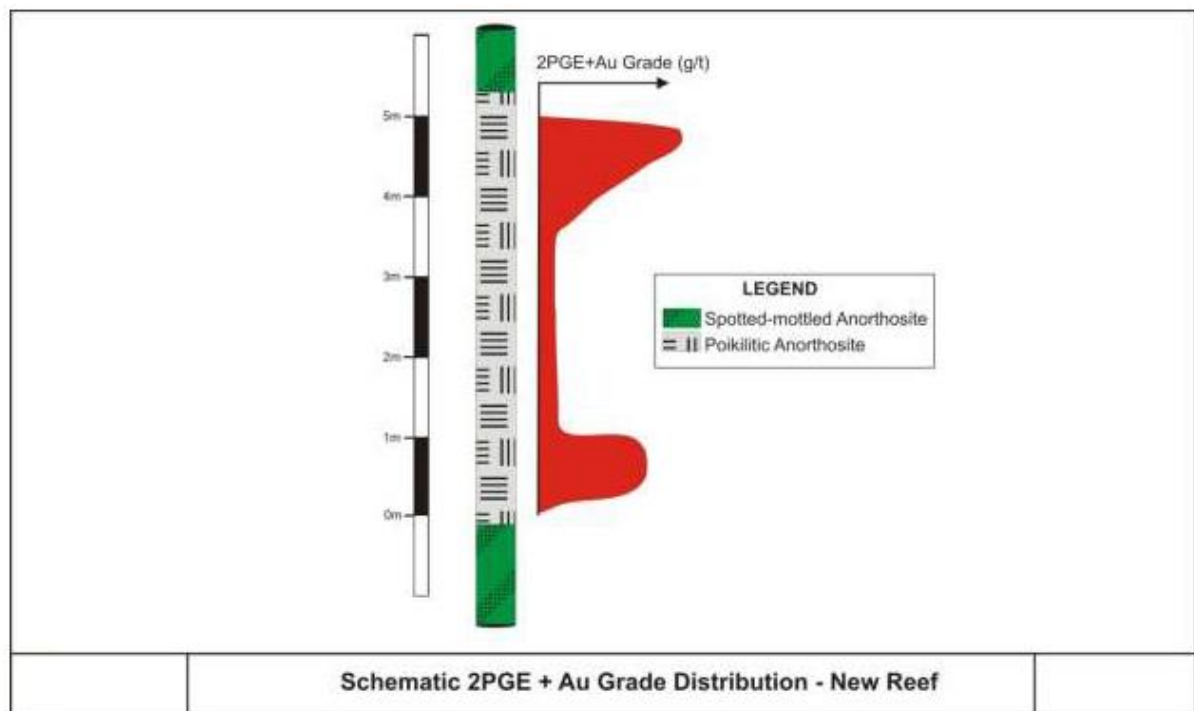
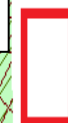


Figure 2: Geology of South Africa

PLAN COMPILED IN ACCORDANCE WITH REGULATION
2(2) OF THE MINERAL & PETROLEUM RESOURCES
DEVELOPMENT ACT, 2002 (ACT 28 OF 2002)

**NTSIKA MINING ADVISORY
(PTY) LTD**
REG. NO: 2014/092761/07

LEGEND



LICENCE AREA



Eccca Group, Karoo
Supergroup



Rashedo Granophyre Suite,
Bushveld Complex



Lebowa Granite Suite,
Bushveld Complex



Pyramid Gabbro-Norite,
Rustenburg Layered Suite



Rayton Formation, Pretoria
Group



SPRINGBOK FLATS
(URANIUM FIELD)



V Ti Fe Cu LINE



VANADIUM ORE
TITANIUM ORE
IRON ORE
COPPER ORE

PROSPECTING AREA

Figure 3: Geological Map of the study area

Topography

Summer rainfall with very dry winters. MAP between about 600 and 700 mm. Frost fairly frequent in winter. Mean monthly maximum and minimum temperatures for Brits-Agr 35.3°C and -3.3°C for January and June, respectively. Corresponding values are 35.3°C and -1.4°C for Rustenburg (November and July) and 32.8°C and -1.0°C for Pretoria University Experimental Farm (January and July). This unit has a relatively more temperate climate than the SVcb 1 Dwaalboom Thornveld.

Important Taxa

Tall Tree: Acacia burkei.

Small Trees: Acacia caffra (d), *A. gerrardii* (d), *A. karroo* (d), *Combretum molle* (d), *Rhus lancea* (d), *Ziziphus mucronata* (d), *Acacia nilotica*, *A. tor-tilis* subsp. *heteracantha*, *Celtis africana*, *Dombeya rotundifolia*, *Pappea capensis*, *Peltophorum africanum*, *Terminalia sericea*.

Tall Shrubs: Euclea crispa subsp. *crispa* (d), *Olea europaea* subsp. *africana* (d), *Rhus pyroides* var. *pyroides* (d), *Diospyros lycioides* subsp. *guerkei*, *Ehretia rigida* subsp. *rigida*, *Euclea undulata*, *Grewia flava*, *Pavetta gardeniifolia*.

Low Shrubs: Asparagus cooperi (d), *Rhynchosia nitens* (d), *Indigofera zeyheri*, *Justicia flava*.

Woody Climbers: Clematis brachiata (d), *Helinus integrifolius*.

Herbaceous Climbers: Pentarrhinum insipidum (d), *Cyphostemma cirrhosum*. *Graminoids: Elionurus muticus* (d), *Eragrostis lehmanniana* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Aristida scabrivalvis* subsp. *scabrivalvis*, *Fingerhuthia africana*, *Heteropogon contortus*, *Hyperthelia dissolute*, *Melinis nerviglumis*, *Pogonarthria squarrosa*.

Herbs: Hermannia depressa (d), *Ipomoea obscura* (d), *Barleria macrostegia*, *Dianthus mooiensis* subsp. *mooiensis*, *Ipomoea oblongata*, *Vernonia oligocephala*.

Geophytic Herbs: Ledebouria revolute, *Ornithogalum tenuifolium*, *Sansevieria aethiopica*

Surface water

Data from the Department of Water Affairs was used to conduct a desktop assessment of the groundwater of the quaternary catchment A23K and A23E.

According to the Groundwater Report compiled by the Department of Water Affairs as part of the Internal Strategic Perspective: Crocodile West Marico WMA (Crocodile River West Catchment), dated 2004, the local geohydrological conditions can be described as follow.

Granite underlies a considerable portion of the WMA, forming four (4) distinct geographical areas within differing topography and use. In general groundwater occurrence is controlled by

weathering and structure. Groundwater occurrence is widespread but generally low, borehole yields are usually <0.5 l/s but sustainable yields up to 2l/s are locally available.

Average concentrations of elements were within the recommended ranges for domestic use with slightly elevated concentrations for Magnesium. This could be due to geological conditions rather than human interference.

Within the quaternary catchments large communal areas are widely dependent on groundwater for water supply. The water table varies between 20 – 40 metres below ground level (mbgl).

Groundwater quality is generally good however zones of elevated TDS (conductivity > 150mS/m) are present in catchments A23J and A23K at depths of 80 – 120m.

Groundwater

Data from the Department of Water Affairs was used to conduct a desktop assessment of the groundwater of the quaternary catchment A23K and A23E.

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Granite underlies a considerable portion of the WMA, forming four (4) distinct geographical areas within differing topography and use. In general groundwater occurrence is controlled by weathering and structure. Groundwater occurrence is widespread but generally low, borehole yields are usually <0.5 l/s but sustainable yields up to 2l/s are locally available.

Average concentrations of elements were within the recommended ranges for domestic use with slightly elevated concentrations for Magnesium. This could be due to geological conditions rather than human interference.

Within the quaternary catchments large communal areas are widely dependent on groundwater for water supply. The water table varies between 20 – 40 metres below ground level (mbgl).

Groundwater quality is generally good however zones of elevated TDS (conductivity > 150mS/m) are present in catchments A23J and A23K at depths of 80 – 120m.

Climate

Climatic conditions in the Crocodile (West) Marico WMA vary significantly from east to west. The climate across the Water Management Area is temperate, and semi-arid in the east to dry in the west. Rainfall is strongly seasonal, with most rainfall occurring as thunderstorms during the summer period of October to April.

Mean annual rainfall ranges from 400 to 800 mm and decreases from the eastern to the western side of the WMA. The mean annual temperature ranges between 18 and 20 °C. Maximum and minimum temperatures are experienced during January and July respectively (State of Rivers Report: DWA, March 2005).

Flora

The study area falls within the Central Bushveld Bioregion and the Savanna Biome. The vegetation types in this area consist of:

- Marikana Thornveld;
- Norite Koppies Bushveld; and
- Central Sandy Bushveld (A very small section of this type falls within the study area. This area is also affected by historical activities and does not represent the natural state of the grass type anymore. For this reason no details is provided for this vegetation type).

Marikana Thornveld:

The Marikana Thornveld occurs on plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the east. The altitude ranges from 1050 – 1450m. The vegetation cover includes open Acacia Karoo woodland, occurring in valleys and slightly undulating plains and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire. Tall and large trees are dominantly of Acacia and Rhus species.

Norite Koppies Bushveld:

Occur within North-West and Gauteng Provinces specifically on the plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the east. The altitude also ranges from 1050 – 1450m. The vegetation features can be described as a low, semi-open to closed woodland up to 5 metres tall. The Norite Koppies Bushveld consists of dense deciduous shrubs and trees with very sparse undergrowth on shallow soils with large areas not covered by vegetation.

Tree and shrub layers are continuous. The stands of this unit are found on noritic outcrops and koppies, many appearing as inselbergs above the surrounding plains.

Visual

The proposed project's drill rigs and machinery may be visible from surrounding villages and roads. The project will however will be located 100 meters horizontal distance from the existing infrastructure.

Archaeology

Graves can be expected especially close to the river with more recent formal and informal cemeteries anywhere else on the landscape.

Drilling activities could directly impact on marked and unmarked graves.

Should any subsurface burial sites be uncovered during the prospecting operations, operations will cease until a certified archaeologist has investigated the site and proposed mitigation measures are put in place to preserve the site.

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will be graded as Generally Protected B (GP.B) which indicates a medium significance.

1.2 The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.

NO GO AREAS

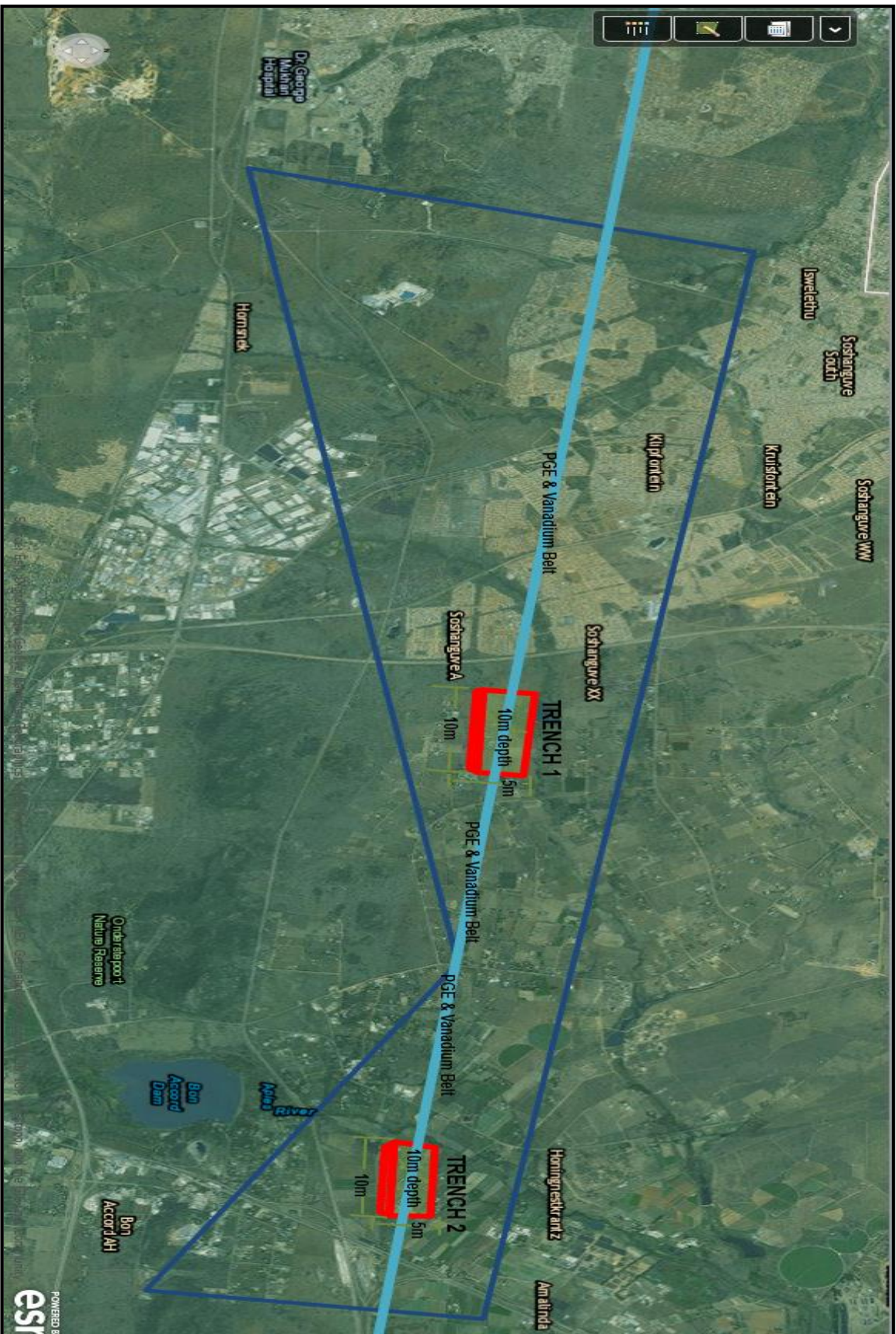
The area is located southeast of the prospecting area, the N1 highway is located 0.5km and 8,49km east respectively from the prospecting area and the settlements of Klipfontein and Soshanguve South are situated 3,61km north and east respectively from the proposed prospecting area, the Bon Accord Dam which is located within the Onderstepoort Nature Reserve south of the of the border of the prospecting area, a Transet single track railway line is situated 2,62km and 9,27km south and southwest of the of the prospecting area and the Sasol Gas Pipeline is situated 4,01km north of the prospecting area forms part of the features which may require protection.

Currently no "No Go" areas have been defined due to the nature of the prospecting activities.

The sensitive areas identified on the proposed site include:

- Sand River (Distance from prospecting area: 1km west)
- Apiesrivier (Distance from prospecting area: 6,127017km east)
- Tolwane River (Distance from prospecting area: 3,970141km west)
- Associated wetland area (Distance from prospecting area: within 5km radius)

- Wetland fauna and avifaunal species (Distance from prospecting area: within 5km radius)
- Crocodile River
- De Onderstepoort Nature Reserve (Distance from prospecting area: 2,087734km south)
- Bon Accord Dam (Distance from prospecting area: 3,77km south)
- Single track railroads (Distance from prospecting area: 0.2km southwest)
- Medunsa University known as the University of Limpopo (Distance from prospecting area: 1,18km southwest)
- Dr George Mukhari Hospital (Distance from prospecting area: 2,86km southwest)
- The R80 Highway which connects the town of Pretoria with Mabopane intersects the prospecting area to the east.
- The Industrial area of Rosslyn is situated 2,67km south of the proposed prospecting area



TYPE OF ALTERNATIVE: No-go

One of the options to be considered for this report is one of no development at all. This will entail leaving the site in its present state. The site is currently vacant. This would result in the site being unattended, uncontrolled and unmanaged which could subject the site to erosion and degradation, as no control mechanisms will be in place to ensure that environmental consequences are kept at a minimum.

Vacant land within the proposed prospecting area is a valuable commodity and resource. It is imperative that this kind of resource is not left vulnerable to the causes and effects of decay and sprawl and its negative economic and social implications. Due to the fact that the site is ideally located along the Sand River and forms part of the current development wave in the area, it is envisaged that the property value will demand site development in the short term alternatively the site may be exposed to further illegal mining activities.

If this development should not get approval to continue the site will remain as it is. The wetland and riparian habitats identified on site will be exposed to human activities that might ultimately negatively impact these sensitive areas. Furthermore should the anthropogenic activities continue unchecked it could result in unnecessary stress on the already sensitive Crocodile River system. Please note that this section will be adequately addressed in the final draft of the EMP phase.

Conservation

Endangered. Target 19%. Less than 1% statutorily conserved in, for example, Magaliesberg Nature Area. More conserved in addition in other reserves, mainly in De Onderstepoort Nature Reserve. Considerably impacted, with 48% transformed, mainly cultivated and urban or built-up areas. Most agricultural development of this unit is in the western regions towards Rustenburg, while in the east (near Pretoria) industrial development is a greater threat of land transformation. Erosion is very low to moderate. Alien invasive plants occur localised in high densities, especially along the drainage lines.

Typical grassland fauna, including small springbok, cats, jackals, hares, Guinea fowl and porcupines are probably present. Reptiles such as lizards and snakes species are also present. Birdlife typical of the area such as birds of prey, starlings and seedeaters are occasionally seen.

The dominant soils in the area are black clayey vertisol soils, which are of the Arcadia and Rensburg forms and are generally known as "black turf". The soils have a high clay content (an average of 40% to 70%), and have a clay mineralogy dominated by smectite.

The high clay content means that the soils do not drain easily. Cracking during the drying process causes surface soil material to fall down the cracks, causing subsoil and topsoil to mix. Accordingly, there is usually no distinction between topsoil and subsoil in the Arcadia profiles.

Due to the distance of the prospecting activities to any surface water source the prospecting activities will not have a significant impact on surface water.

There are no protected areas in the immediate vicinity, but several small game farms are located within the 20km radius. These farms would not be negatively impacted. The Onderstepoort Nature Reserve is situated south of the proposed prospecting area, see Fig. 4

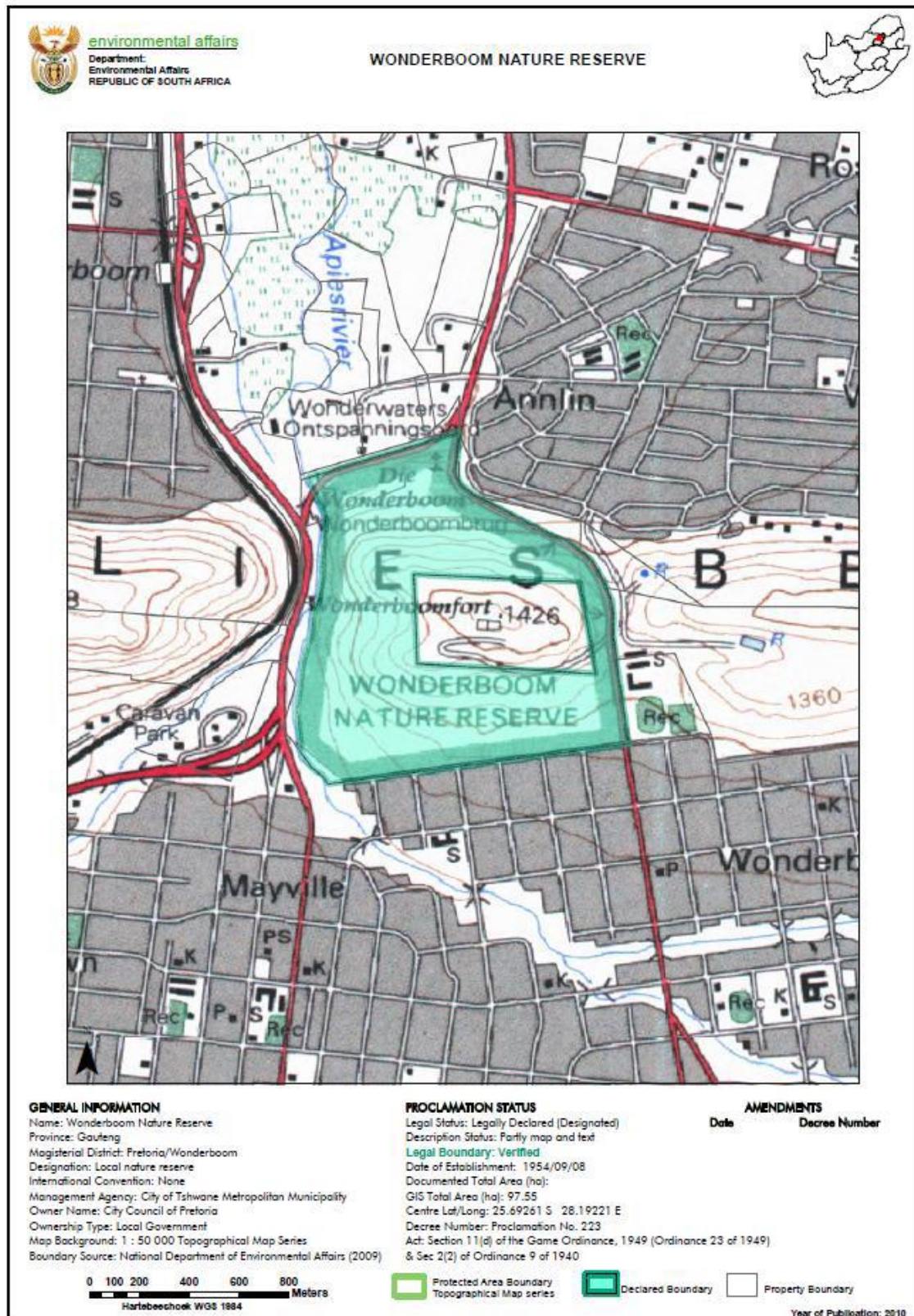


Figure 4: De Onderstepoort Nature Reserve

Map investigations showed that urban areas with large concrete buildings also classified in the industrial class. This was not represented in the error matrix as samples were randomly chosen per class missing these cases. The spectral nature of the waste rock dumps was in some cases

identical to bare agricultural soil and urban areas, due to compositional and surface texture similarities.

The chapter describes the existing status of the receiving environment which will be impact on by the proposed prospecting activities and associated temporary infrastructure development. As required by the EMP Template, the following information is included under this chapter:

REGULATION 50 (a):

- (Section 1): Description of the baseline environment:
 - (Section 1.1): Concise description of the environment on site relative to the environment in the surrounding area;
 - (Section 1.2): Concise description of each of the existing environmental aspects both on the site applied for and in the surrounding area which may require protection or remediation;
 - (Section 1.3): Concise description of the specific land uses, cultural and heritage aspects and infrastructure on the site and neighbouring properties/farms in respect of which the potential exists for the socioeconomic conditions of other parties to be affected by the proposed prospecting operation;
 - (Section 1.4): Annotated map showing the spatial locality and aerial extent of all environmental, cultural/heritage, infrastructure and land use features identified on site and on the neighbouring properties and farms; and
 - (Section 1.5): Confirmation that supporting documents in the form of specialist studies are attached as appendices.

REGULATION 50 (d):

- (Section 1 – 8): Identification of the alternative land uses which will be impacted upon. (Include all the items to be included in the list referred to in the concomitant section of the guideline posted on the official website of the Department)
- (Section 1 – 9): Listed results of a specialist comparative land use assessment.
- (Refer to the concomitant section of the guideline posted on the official website of the Department and attach the specialist study as an Annexure).

Information has been obtained from the detailed environmental baseline studies which were undertaken within the study area as well as desktop research.

1.3 Map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.

(See Annexure B)

In terms of the Gauteng Department of Agriculture and Rural Development guidelines for Integrated Environmental Management (IEM), sensitive landscapes are a broad term applying to:

- Nature conservation or ecologically sensitive areas – indigenous plant communities (particularly rare communities or forests), wetlands, rivers, river banks, lakes, islands, lagoon, estuaries, reefs, intertidal zones, beaches and habitats of rare animal species.
- Unstable physical environments, such as unstable soil and geotechnically unstable areas;
- Important nature reserves – river systems, groundwater systems, high potential agricultural land
- Sites of special scientific interest;
- Sites of social significance or interest – including sites of archaeological, historic, cultural spiritual or religious importance and burial sites;
- Green belts or public open space in municipal areas

Preliminary potential sensitive features that have been identified include (refer to Figures 5 & 6):

- Ecological sensitivity (Rivers and pans);
- Sensitive water related features including: drainage- and flood lines with associated buffers and wetlands/pans;

Possible family graves on farmsteads.

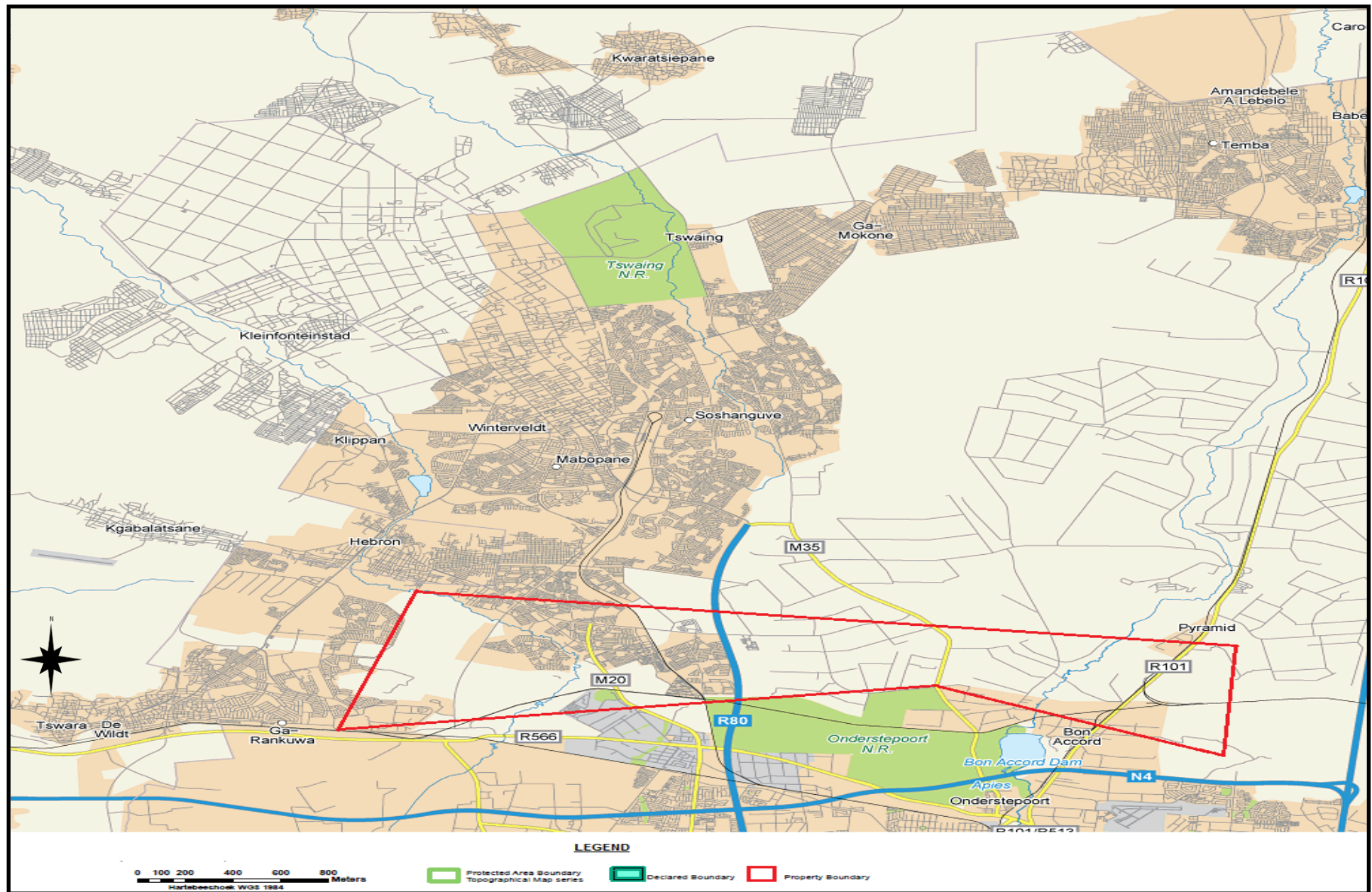


Figure 5: Protected and Sensitivity Map

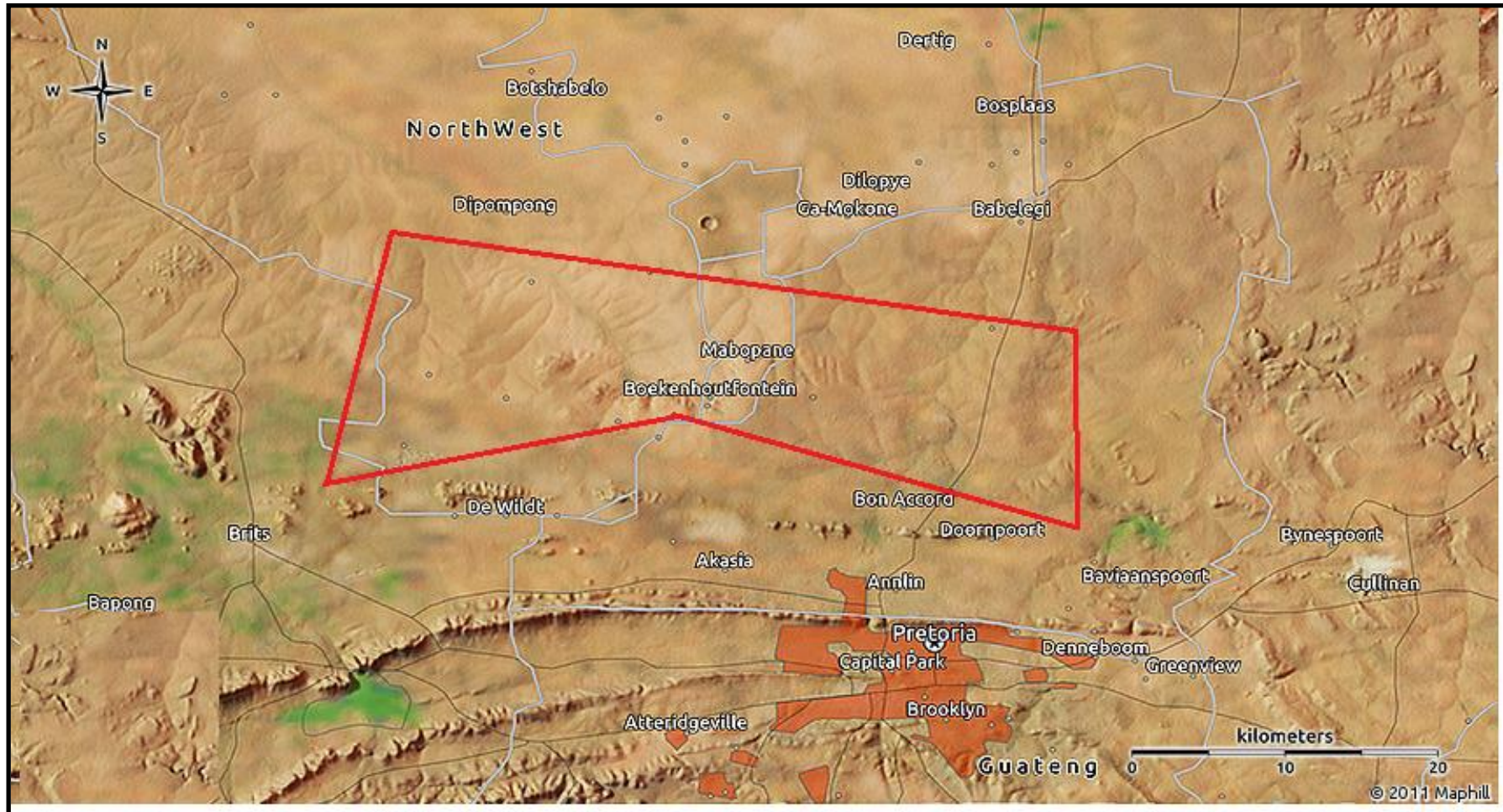


Figure 6: Protected and Sensitivity Map

1.4 Confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties,

The compilation of the description of the environment has been through government departments and affected communities, & councillors, which has not objected to our Prospecting Right. There is an on-going consultation with the Affected Parties, Affected Communities and others relevant stakeholders. See proof of consultation attached as Annexure III

2 REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio- economic conditions and cultural heritage.

2.1 Description of the proposed prospecting or mining operation.

Access to the site is through N1 highway and the already existing permanent access roads which run through the application area which will be used as the access road to the farm. Development involving the mechanical excavation of naturally occurring mineralised rocks. This site represents a total of 10 drill sites to be used. Approximately 50,000 m³ of mineralised rocks will be removed from two planned trenches by means excavators, loaded direct to dump trucks and hauled to the pilot plant off site. Total excavation volume including overburden is approximated at 75,000 m³.

- Sixteen (10) holes between the depth 150 – 400 m deep – total drilling metreage – 4000 meters
 - Phase 2a: It is planned to drill 5 holes using Reverse Circulation drill to an average depth of 200m. Therefore total drilling depth = 1000 m.
 - Phase 2b: Planned to drill a further 5 holes to 150m average depth = 750 meters total drilling depth; will be done concurrently with back filling.

Bulk sampling permission should be obtained from the Minister concomitant with Section 20 of the MPRDA 2002 together with an Environmental Authorisation will be submitted as soon as the right has been issued. This application is amended accordingly. A time schedule, phasing the various prospecting activities is attached. Refer to Table – 2 below.

Phase	Activity	Skill(s) required	Timeframe	Outcome	Timeframe for outcome	What technical expert will sign off on the outcome?
Phase 1 [desktop study]	Desktop study, Planning of logistics of the physical drilling programme, Geological Mapping, sampling and analysis	Geologist	1-6 months	Geological report and feasibility study	6 months	Geologist
Phase 2	Drilling of 5 boreholes, Recording of boreholes log and Metallurgical Tests	Geologist	6-12 months	Borehole core data	6 Months	Geologist
Phase 3	Drilling of extra 5 boreholes	Geologist	12-36 months	Borehole core data	24 Months	Geologist
Phase 4	Environmental Study, Socio-economic impact assessment, Rehabilitation, Feasibility study	Geologist and Environmentalist	36-60 months	Environmental Reports, Socio-economic impact report, and the rehabilitation report	24 Months	Geologist and Environmentalist

Table 3: Time schedule and phasing the various prospecting activities

2.1.1 The main prospecting activities (e.g. access roads, topsoil storage sites and any other basic prospecting design features)

The Prospecting Work Programme (PWP) consists of both Non-Invasive and Invasive Prospecting Methods.

The main activities and design features associated with the development and operation are summarised as follows:

Non-Invasive Activities will include:

- a desktop study on data availability on generic/conceptual geological model. Use of datasets supplied by the Government (Council of Geoscience) could include regional geological and geophysical plans that could be used.
 - Any data available including previous work, generic/conceptual geological models will be studied to aid the planning of the work programme and determine possible size and extent of potential mineralization / ore body.
 - Use of datasets supplied by Government (Council of Geoscience) could include regional geological and geophysical plans aided by remote sensing methods including satellite imagery, aerial photography and airborne geophysical surveys.
 - Field reconnaissance of the area will be conducted to ascertain access and determine possible outcrop / sub crop relation of potential mineralization / ore body. This will be done to determine the possible extent of the mineralization / ore body in terms of strike length, thickness, dip and depth below surface.
 - Re-evaluation of previously explored areas of similar nature is very important at this stage to build conceptual geological modes.
- Geological Mapping to be conducted with the use of ortho-photos and aerial photography and satellite imagery of the area.
 - More detailed geological mapping will be conducted regionally and possibly also on lines/grids across area. This will be done utilizing 1:10 000 Ortho photos of the area but also using aerial photography, satellite imagery to accurately record the nature, location and structure of the various rocks in the target area. The end product of geological mapping is a map which accurately documents rock types, alteration mineralogy and structural data such as faults, folds and dip of strata.
- Geophysical Survey methods on the target area.
 - Adding to the 1:250 000 Regional Gravity and Total Field Magnetic data sets (obtained from the Council of Geoscience); various methods of geophysical surveys will be applied (if value adding) on the target areas and might include:

ground magnetic, gravity and radiometric traversing on irregular grids where road infrastructure allows for it and symmetrical grid traversing in areas where possible. This will aid in further defining possible extent of mineralization / ore body.

Invasive activities will include:

- Drilling – the presence of concealed mineralization / ore body can only be confirmed and outlined by drilling. **36.4mm** Core boreholes will be drilled to ascertain the sequence stratigraphy and potential prospective reef horizons.

A follow up exploration drilling program will be conducted as the source for gaining ground truth information of the potential ore body and to prove continuity in the third dimension. This drilling will be conducted in a basic one phase approach. Primary Exploration drilling on a widely spaced grid which is intended to simply delineate the mineralization.

Core drilling of BQ (**outside diameter core of 36.4mm**) size will be the preferred drilling method but as the nature of the mineralization are established other forms of drilling could be used such as percussion, reverse circulation and rotary blast be used.

With the above being said, non-invasive prospecting methods will not have an impact on the receiving environment. Invasive activities (drilling) will have an impact, although limited, on the receiving environment.

Activities associated with drilling will include the establishment of temporary access roads where existing access roads cannot be used. These access roads will be tracks and will be utilised for the duration of the prospecting phase. A number of small drilling sample sites will be cleared from vegetation in order to allow for the drilling operation to continue. Water will be sourced off site in the event where no water is available on site. Water will be circulated throughout the drilling operation and is needed to cool the drill rig. Circulated water will be stored in temporary plastic lined sumps and cleaned with oil water separators for reuse.

The area to be cleared will generally not exceed 20m X 20m. The figure below illustrates a typical drill site and sample drill core to be sent for analysis.

The site is proximal to the (R101) Road. A temporary unsurfaced access track approximately 10 m in length will be required to link the road to the site. Proposed prospecting location is illustrated on Drawing.

2.1.2 Plan of the main activities with dimensions

Plan drawings are presented (See **Annexure E**)

Access to the site is through N1 highway and the already existing permanent access roads which run through the application area which will be used as the access road to the farm. Development involving the mechanical excavation of naturally occurring mineralised rocks. This site represents a total of **10** drill sites to be used. Approximately **50,000 m³** of mineralised rocks will be removed by means excavators, loaded direct to dump trucks and hauled to the pilot plant off site. Total excavation volume including overburden is approximated at **75,000 m³**.

- Sixteen (10) holes between the depth **150 – 400 m** deep – total drilling metreage – **4000** meters
 - **Phase 2a:** It is planned to drill **5** holes using Reverse Circulation drill to an average depth of **200m**. Therefore total drilling depth = **1000 m**.
 - **Phase 2b:** Planned to drill a further **5** holes to **150m** average depth = **750 m** total drilling depth; will be done concurrently with back filling.

Bulk sampling permission should be obtained from the Minister concomitant with Section 20 of the MPRDA 2002, an Environmental Authorisation will be submitted as soon as the right has been issued. This application is amended accordingly. A time schedule, phasing the various prospecting activities is attached. Refer to Table – 2 below.

Table 4: Time required for each phase of the proposed prospecting operation.

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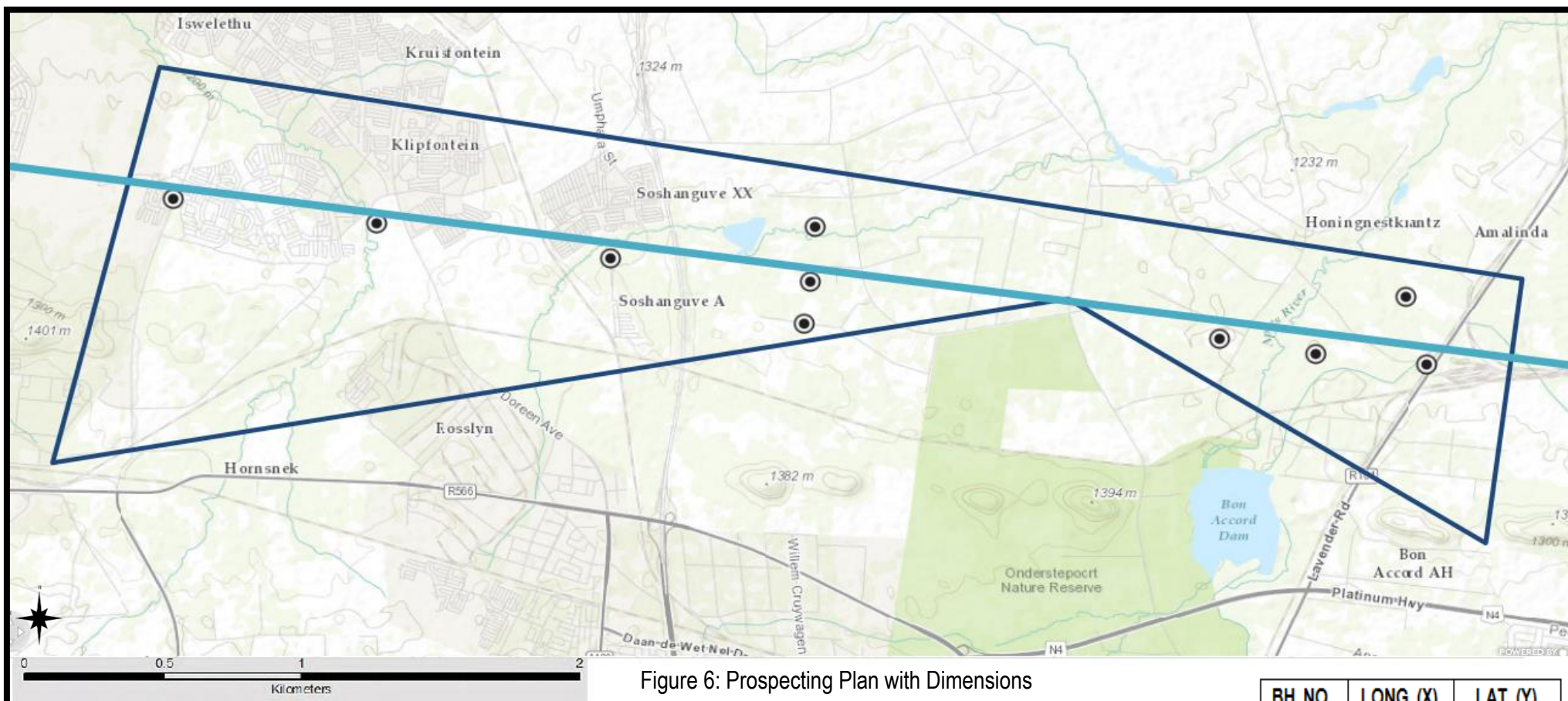




Figure 6: Prospecting Plan with Dimensions

LEGEND

Scale 1: 34 400

-  PROPOSED DEPOSIT BOREHOLE
-  PROPOSED GROUNDWATER BOREHOLE
-  PROSPECTING AREA
-  MAIN ROADS AND FREEWAYS
-  V Ti Cu Fe Belt

Proposed Prospecting Plan

Boreholes Grid: 500m X 500m and 200m X 200m
TOTAL NUMBER OF PROPOSED BOREHOLES:10

Proposed Deposit Borehole Layout

PLAN COMPILED IN ACCORDANCE WITH REGULATION 2(2) OF THE MINERAL & PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) BUT SUBJECT TO REGULATION 17 OF THE MINE HEALTH AND SAFETY ACT EXCLUDING ANY AREA WITHIN HORIZONTAL 100 METERS OF ANY PUBLIC ROAD, RAILWAY, RIVERS, CEMETARY, RESIDENTIAL AREA OR PUBLIC AREA ETC.

GEOGRAPHIC CO-ORDINATE SYSTEM
GCS_WGS_1984

BH.NO.	LONG.(X)	LAT.(Y)
BH01	28.044530	-25.587814
BH02	28.072267	-25.590943
BH03	28.104127	-25.595382
BH04	28.131415	-25.598513
BH05	28.132080	-25.591358
BH06	28.130547	-25.604054
BH07	28.187161	-25.605746
BH08	28.212574	-25.600350
BH09	28.215365	-25.609040
BH10	28.200133	-25.607487

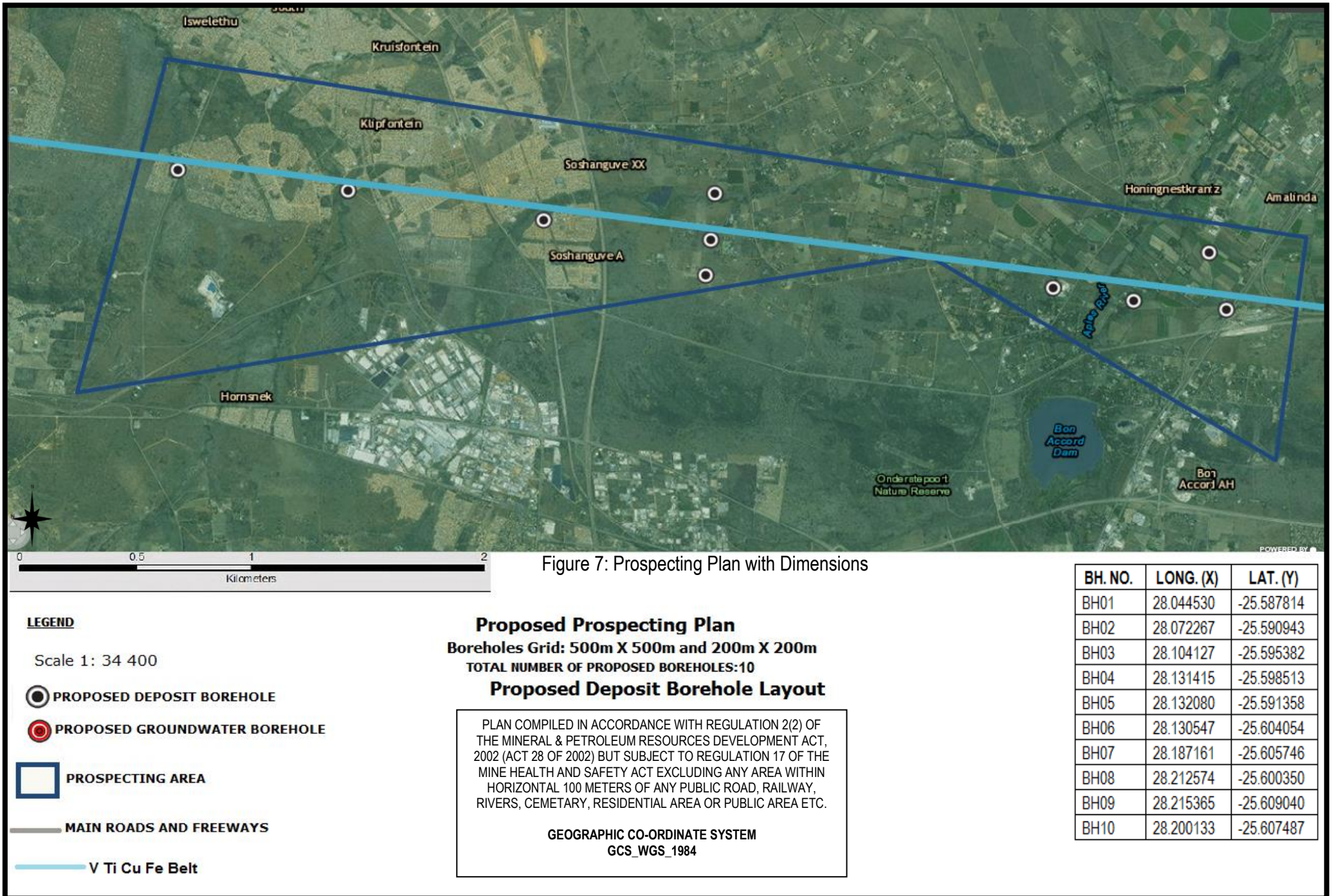


Figure 7: Prospecting Plan with Dimensions

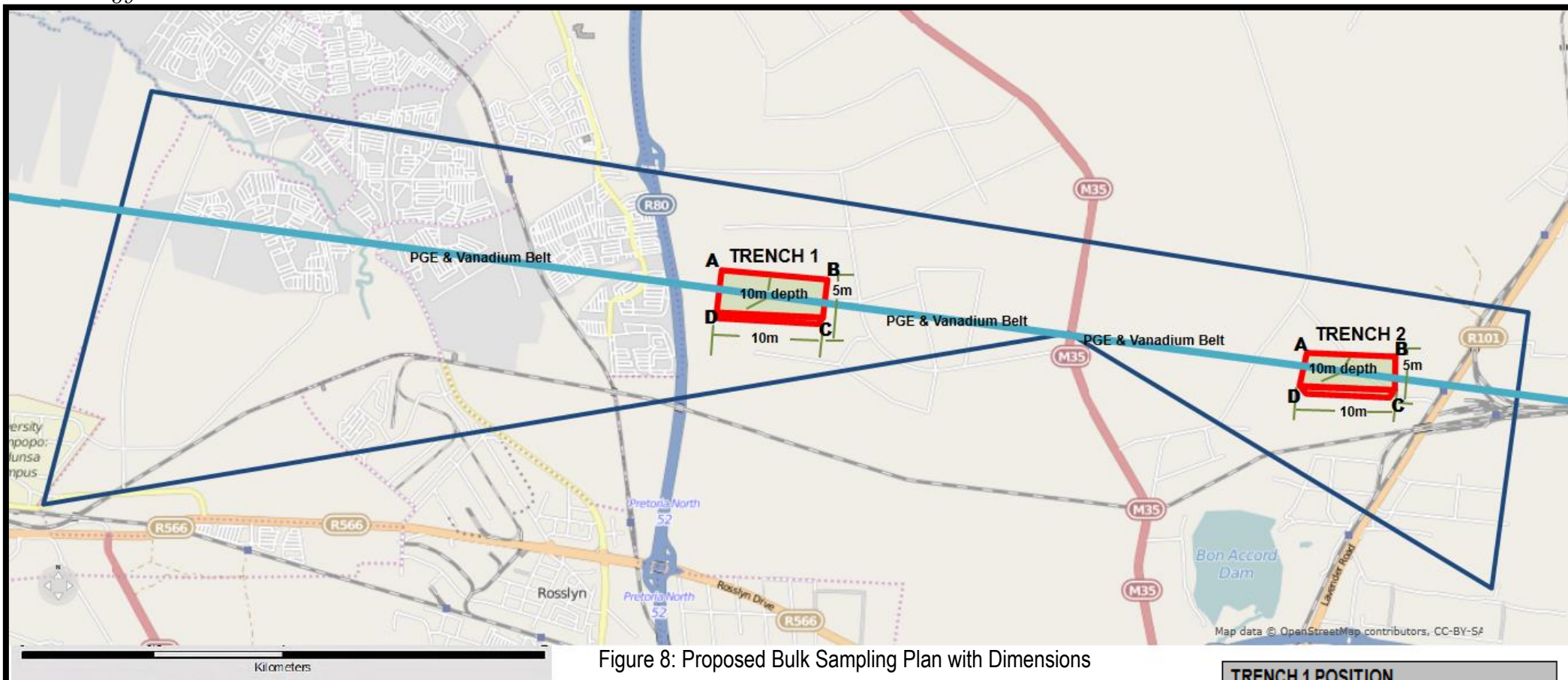


Figure 8: Proposed Bulk Sampling Plan with Dimensions

LEGEND

Scale 1:64 965

Proposed Deposit Trenches

Proposed Prospecting Area

Main Roads

V Ti Cu Fe Belt

Proposed Bulk Sampling Plan**Number of Trenches 2****Trenching and Excavation Dimensions**

PLAN COMPILED IN ACCORDANCE WITH REGULATION 2(2) OF THE MINERAL & PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) BUT SUBJECT TO REGULATION 17 OF THE MINE HEALTH AND SAFETY ACT EXCLUDING ANY AREA WITHIN HORIZONTAL 100 METERS OF ANY PUBLIC ROAD, RAILWAY, RIVERS, CEMETARY, RESIDENTIAL AREA OR PUBLIC AREA ETC.

GEOGRAPHIC CO-ORDINATE SYSTEM
GCS_WGS_1984

**TRENCH 1 POSITION**

POSITION	LONG. (X)	LAT. (Y)
A	28.119835	-25.592879
B	28.133887	-25.593854
C	28.132806	-25.599285
D	28.118909	-25.598588

TRENCH 2 POSITION

POSITION	LONG. (X)	LAT. (Y)
A	28.198583	-25.602905
B	28.210627	-25.603462
C	28.210009	-25.608614
D	28.197502	-25.607222

2.1.3 Description of construction, operational, and decommissioning phases

Construction activities:

Site establishment

Construction and enabling works will consist of the following activities:

- Erection of temporary perimeter fence (diamond mesh on steel posts) and signage;
- Vegetation clearance and mulching;
- Surface soil strip across the whole of the site;
- Construction of temporary vehicular and pedestrian access route between the R101 road and the site.
- Erection of a temporary site office and hygiene facilities;
- Stockpiling of vegetation mulch and surface soils / topsoil.

The site establishment phase of works will extend over a period of approximately 5 working days.

No physical construction activities will take place as no permanent infrastructure will be established. Activities will relate to the possible establishment of a temporary access road as well as the clearing of vegetation on prospecting sites / drill sites. Temporary access roads will be constructed from existing road infrastructure with the shortest possible route to the drill site, which will minimise the environmental impact related to this activity. These temporary access roads will not be used by haulage trucks; however these roads will be utilised by personnel vehicles for general site inspections and pick-up of drill core during the operational phase. Topsoil is stored in order to allow for future rehabilitation.

Topsoil stockpiles are covered during windy and rainy months in order to limit soil erosion.

The prospecting operation will broadly consist of the following four phases:

- Phase 1 - Site establishment;
- Phase 2 - Prospecting;
- Phase 3 - Decommissioning; and,
- Phase 4 - Site rehabilitation and reinstatement.

The purpose of the prospecting operation is solely to determine the grade of ore sampled, and the quantity of ore. Will be used to determine metallurgical characteristics, a laboratory will be envisaged at this stage and a final programme and timeframe for the upgrade works has not been finalised; it is envisaged however that the works will commence in August 2015 and extend over a period of approximately 60-months.

A summary of the various activities and timeframes associated with the prospecting operation follows. Potential impacts identified for the various phases and activities are discussed in detail in Section 2.2 of this document.

Operational activities:

The drill rig will be brought onto site for drilling. The drill rig will target the UG2 and other available reefs for which the drill cores will be sent to a laboratory for analysis. Water stored on the drill site will be circulated to cool the drill rig (tip) until drilling on the site is complete. The drill rig will move systematically from one site to another up until the desired number of prospecting holes has been drilled. It can take from a couple of days to more than a month to drill one site depending on technical problems or geotechnical rock conditions.

In most instances the drill crew stay close to the drill site in temporary accommodations facilities (such as mobile homes). The energy source utilised is gas. Fire is not permitted, especially during the winter months. Waste is separated on site in accordance with the principles of waste recycling and reuse as stipulated by the National Environmental Management Waste Act (NEM:WA).

Decommissioning

Decommissioning will be carried out on completion of the prospecting operation and will consist of the following activities:

- Removal of temporary facilities and structures;
- Removal and appropriate disposal of waste materials;
- Removal of pilot plant and equipment; and,
- Removal of temporary perimeter fencing and signage.

The decommissioning phase of works will take approximately 5 working days to complete.

Rehabilitation activities:

Rehabilitation activities will entail the following:

- Rehabilitation of each drill site concurrently with drilling program. As the drill rig moves off the particular site the site will be rehabilitated;
- Ensure that all hydrocarbons are removed from the site and separated from the water;
- All hydrocarbons to be removed from the drill site and disposed of at a registered municipal waste handling facility;

- All other domestic waste drums removed from the site and waste disposed of at a registered municipal waste management facility. No waste is to be burned or buried at any time during prospecting;
- Plastic liners used in the sumps will be removed prior to final rehabilitation. Where possible liners will be reused or alternatively disposed of;
- Topsoil as previously removed and stockpiled will be spread evenly over the area;
- The area will be ripped where needed (i.e. in cases where subsoil have been compressed);
- Generally topsoil contains seeds needed for future rehabilitation however, vegetation establishment will be monitored and where needed additional seeds planted for indigenous vegetation establishment.
- The remainder of the site will be re-graded and surfaced with previously stockpiled surface and mulch material. The site will be re-vegetated with species indigenous to primary Marikana.
- It is envisaged that the rehabilitation phase of works will be completed over a period of 4- weeks. Post rehabilitation vegetation monitoring will be conducted over a period of 24- months. The works are summarised as follows:
 - Reshaping of the open space;
 - Re-grading and resurfacing of the site;
 - Re-planting; and,
 - Post rehabilitation monitoring.



Figure 4: Typical rehabilitated site after drilling has ceased.

2.1.4 Listed activities (in terms of the NEMA EIA regulations)

Due to the small scale of the prospecting activities and the temporary nature of these activities, no listed activities will be triggered. It will be ensure that no prospecting activities be undertaken within 32 metres of a watercourse which will be the only probable listed activity that could be triggered. No electricity or bulk water supply construction will be necessary.

2.2 Identification of potential impacts

2.2.1 Potential impacts per activity and listed activities

Activity: Earth Clearing:

This activity will relate to earth clearing for the establishment of prospecting drill sites. These sites will not be larger 20m x 20m each. A number of these sites might be established, the number of sites will be determined from the non-invasive prospecting methods. Temporary access roads will also be established. These temporary access roads will be developed based on the shortest route from existing road infrastructure to the drill sites.

The activity will entail the clearing of vegetation, small shrubs (i.e. herbaceous layer) and grasses. Indigenous trees will not be removed. Vegetation will be removed by means of manual labour or by means of mobile earth moving equipment which will be removed from the site after earth clearing. Topsoil will then be removed and stockpiled for future site rehabilitation.

The impacts associated with this activity could relate to:

- Loss of biodiversity
 - Due to the relative small footprint areas this impact will be of low significance (as the area in some parts has already been disturbed and the biodiversity is already somewhat low). In specific terms the impact will be associated with a loss of fauna biodiversity (most animals will mobilise to other areas) with the biggest impact on smaller species (insects) that cannot mobilise as quickly as larger animal species.
- Soil erosion
 - Soil erosion is the biggest impact during this activity especially during rainy and windy seasons. Heavy downpours could result to valuable topsoil being washed into rivers and streams. Wind erosion could also lead to the loss of valuable topsoil. Soil erosion by wind and water could respectively lead to dust (air quality impacts) and sedimentation of the watercourses in the area.
- Heritage Landscape
 - Drilling activities and associated activities such as road establishment could directly impact on surface and subsurface archaeological sites. The significance of this impact is rated to be low - medium.

Activity: Site establishment

This activity will entail the establishment of each prospecting site. There might be one, two (or more) active prospecting sites at any given time during the prospecting operations. Site establishment will include setting up of contractors camp (mobile homes), bringing equipment including the mobile drill rig onto site.

Service and mechanical equipment will also be brought onto site. No permanent infrastructure will be established. All equipment will be removed from the site once prospecting has ceased.

Site establishment could result in the following impacts:

- Generation of waste
 - Domestic and hazardous (hydrocarbons) waste
- Soil contamination

- This could occur in the event of hydrocarbon spillages.
- Soil erosion
 - If soils (as a result of earth clearing) are left exposed.
- Water pollution
 - A major hydrocarbon spill could lead to surface water pollution if left unattended.

Activity: Drilling

Drilling of the area will be undertaken by core drilling using a core drilling technique. A drill bit with a diameter of 36,4mm will be used. The drill bit is attached to the drill string, which is suspended from the drill rig's derrick and then rotated in the hole. During the first part of the drilling operation the drill bit would crush the rock into small particles called cuttings. The cuttings will be removed from the bottom of the hole by the drilling fluid. Once the top section of the hole has been drilled a steel casing would be inserted to secure the wall of the hole and also to prevent any groundwater contamination.

This being said, the impacts associated with drilling are listed below:

- Groundwater and surface water contamination
 - It is highly unlikely that these impacts could occur as a result of drilling however, should these impacts occur the significance will be low.
- Soil Contamination
 - Soil contamination is a possible impact during the drilling process due to the fact that water containing hydrocarbons are used throughout the drilling process. Oil sumps (Refer to Figure 10) are used to contain water consisting of hydrocarbons during the drilling process and these sumps should be properly lined to ensure that the water used during the drilling process does not contaminate the soil.
- Noise
 - Drilling could increase the ambient noise levels somewhat. This impact will be considered to be low to very low as the recommended noise levels of 50dBA during daytime will not be exceeded. No drilling will take place during the night-time.
- Surface water contamination from drilling fluid (water)

- The drilling fluid which is essentially water containing traces of hydrocarbons but mostly inert material originating from drilling, could seep into the surface and groundwater system if the temporary sumps is not lined properly. Daily inspections will be required to ensure that all linings are intact and that no seepage can occur. Should this impact occur the impact could be of low to medium low significance depending on the location of the drill site to watercourses in the area and the amount of hydrocarbons in the water.
- Heritage Landscape
 - Drilling activities could possibly directly impact on historic sites affecting both the visual context and sense of historical sites. The results of the HAA concluded that drilling activities will have a negligible impact on the historic time period and cultural landscape due to the lack of any noteworthy sites in the area.
 - Graves can be expected especially close to the rivers with more recent formal and informal cemeteries anywhere else on the landscape. Drilling activities could directly impact on marked and unmarked graves.

On completion of drilling the drill core will be transported to an on-site or off-site core shed where the core will be logged. This activity will not impose any significant environmental impacts as this activity only entails the temporary storage of drill cores.



Figure 5: Typical oil sumps consisting of water and hydrocarbons

Activity: Site rehabilitation

This activity will involve the removal of all equipment and personnel from the site.

Plastic linings in sumps will be removed and could be transported to the next site if still usable. If no longer usable it will be disposed of offsite.

Once all equipment has been removed the sumps can be backfilled and the area levelled with the topsoil as stockpiled during initial earth clearing activities (Figure 4).

Impacts as a result of site rehabilitation are:

- Soil erosion
 - If the area is backfilled prior to a major rain event soils will wash off into drainage and water systems resulting in the permanent loss of valuable topsoil and sedimentation of rivers and streams.
- Flora
 - With soil erosion is the associated poor establishment of a vegetation cover which is difficult to rehabilitate after the occurrence of such an impact. This could also impact fauna species as a result of a poor vegetation cover.
- Fauna
 - Fauna species will return to the area after rehabilitation provided that the area is rehabilitated well in terms of vegetation establishment.

NOTE: In previous years prospecting activities based on the same technology and methods were undertaken in the same area. These prospecting sites have been rehabilitated fully.

2.2.2 Potential cumulative impacts

Should an impact occur the following potential cumulative impacts could occur:

- Cumulative impacts on surface water in the event that spills aren't cleaned up immediately after occurring.
- Sedimentation of the Sand river and other watercourses in the event of poor topsoil management which will increase TDS and Electric Conductivity (EC) (refer to surface water quality results as discussed above).
- Soil erosion which will contribute towards the national loss of soils with agricultural potential.
- Contribution towards invasion of alien species which leads to reduced water quantities in local rivers and streams and a contribution towards the national problem of invasion of alien species in South Africa's water systems.

- Noise levels in the area could be elevated especially during daytime as a result of noise already generated on local roads and within the Industrial areas. This impact will vary based on the location of prospecting sites at any given time.

2.2.3 Potential impact on heritage resources

The HAA will be conducted by Miles Environmental and Heritage Consultants and (MEAHC) and the report will be provided to the South African Heritage Agency upon request and will be attached as Annexure F. The HAA will reveal any heritage sites, features and objects which may be expected within the study area:

Archaeological

There is a high likelihood of finding Middle Stone Age artefacts scattered over the study area; these sites are mostly out of context and of low – medium archaeological significance. There is an increased likelihood of finding Stone Age material nearer to rivers, tributaries and ridges. Several stone walled settlements are known from the literature occurring in the wider region (Medunsa S25 36 27.5451 E28 01 35.8124) Makau S25 36 9.1419 E 27 54 47.2624) Zambok Zyn Kraal S25 35 42.1251 E 28 01 17.5626.

During the site visit conducted by HCAC the following sites were recorded (of these sites only CA9 and CA10 were recorded on the Farm Klipfontein 268 JR):

Site Number	Type Site	Cultural Markers	Co ordinate	Heritage Significance
Late Iron Age 1	Late Iron Age	Stone Walls and Ceramics	S25 36 42.4 E28 02 06.9	Medium
Late Iron Age 2	Late Iron Age	Stone Walls and Ceramics	S25 36 05.3 E28 03 39.8	Medium
Late Iron Age 3	Late Iron Age	Stone Walls and Ceramics	S25 36 06.8 E28 03 40.8	Medium
Late Iron Age 4	Late Iron Age	Stone Walls and Ceramics	S25 36 20.1 E28 03 22.8	Medium
Late Iron Age CA9	Late Iron Age	Stone Walls and Ceramics	S25 36 15.0 E28 03 04.0	Medium
Late Iron Age CA10	Late Iron Age	Stone Walls and Ceramics	S25 36 28.0 E28 02 50.0	Medium

Drilling and associated activities like roads etc. could directly impact on surface and subsurface archaeological sites with a low to medium impact on a local scale.

Historical Finds

Possible Historical finds including middens, structural remains and cultural landscapes. The HAA will highlight whether the area was occupied at least from the 1900's and features dating to this period associated with farming can be expected.

Site Number	Type Site	Cultural Markers	Co ordinate	Heritage Significance
Historical 1	Possibly Historical	Square stone foundations	S25 35 58.9 E28 03 27.8	Low
Historical 2	Possibly Historical	Square stone foundations	S25 36 03.6 E28 03 30.2	Low

Drilling activities can directly impact on historic sites affecting both the visual context and sense of place of historical sites. Drilling activities will have a negligible impact on the historic time period and cultural landscape due to the lack of any noteworthy sites in the area. On the farm Honingnestkrans 269 JR (Portion 223), the land owner Mr. Paul Lock took us to an old grave yard consisting of more than 60 graves which he believes that it's an old burial area for farm workers and farm dweller. These graves are found approximately on the following coordinates Longitude 28°10'44.0"E Latitude 25°34'51.5"S. Further studies need to be conducted even though these graves will not be affected by the prospecting activity.

Burials and Cemeteries

Graves can be expected especially close to the river with more recent formal and informal cemeteries anywhere else on the landscape. Drilling activities could directly impact on marked and unmarked graves. Should any subsurface burial sites be uncovered during the prospecting operations, operations will cease until a certified archaeologist has investigated the site and proposed mitigation measures are put in place to preserve the site. Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will be graded as Generally Protected B (GP.B) which indicates a medium significance.

Legislative requirements

Aspects concerning the conservation of cultural heritage are mainly dealt within the Heritage Resources Act (Act 25 of 1999) and, to a lesser extent, the Environmental Conservation Act (Act 73 of 1989).

National Heritage Resources Act

This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. Our heritage is unique and precious and it cannot be renewed. It helps us to define our cultural identity and therefore lies at the heart of our spiritual well-being and has the power to build our nation. It has the potential to affirm our diverse cultures, and in so doing shape our national character.

In terms of Section 35(4) of this act, no person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or material or any meteorite; bring onto, or use at an archaeological or palaeontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of Section 7(1) of the Act, SAHRA, in consultation with the Minister and the MEC of every province, must by regulation establish a system of grading of places and objects which form part of the national estate, and which distinguishes between at least the categories-

(a) Grade I: Heritage resources with qualities so exceptional that they are of special national significance. Examples would be Mapungubwe Iron Age Site or the Castle in Cape Town.

(b) Grade II: Heritage resources that, although forming part of the national estate, can be considered to have special qualities that make them significant within the context of a province or a region.

Examples would be sites containing rock art, or the house of a person important in the history of the country.

(c) Grade III: Other heritage resources worthy of conservation. Examples would be houses showing architectural merit, etc.

Environmental Conservation Act

This act states that a survey and an evaluation of cultural resources should be undertaken in areas where development, which will change the face of the environment, is to be made. The impact of the development on the cultural resources should also be determined and proposals to mitigate this impact are to be formulated.

Identification of risk sources

The Environmental Impact Assessment is focused on two phases of the proposed development: the construction and operation phases. However, from a cultural heritage perspective, this distinction does not apply. Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted, can be written into the management plan, whence they can be avoided or cared for in the future.

Impact description and assessment

Impact analysis of cultural resources under threat of the proposed development, are based on the present understanding of the prospecting activities.

Each site is unique and should be treated separately.

The significance of a heritage site and artefacts is determined by its historical, social, aesthetic, technological and scientific value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Sites regarded as having low significance are viewed as being recorded in full after identification and would require no further mitigation. Impact from the development would therefore be judged to be low. Sites with a medium to high significance would therefore require mitigation. Mitigation, in most cases the drilling of a site, is in essence destructive and therefore the impact can be viewed as high and as permanent.

Stage in project lifecycle	Extent	Duration	Intensity	Probability of occurrence/risk	Significance	
					WOMM	WMM
Construction						
Damage	Local	Permanent	High	Highly probable	High	High
Looting	Local	Permanent	Medium	Probable	Medium	Low
Operation						
Damage	Local	Permanent	Medium	Probable	High	Low
Looting	Local	Permanent	Low	Improbable	Low	Low

WOMM: Without mitigation measures

WMM: With mitigation measures

Recommended mitigation / management measures

The following objectives and design standards, if adhered to, can eliminate, minimise or enhance potential impacts.

- The developer must ensure that an archaeologist inspects each site selected for the erection of a drill site. If a particular establishment impacts on a heritage site but cannot be shifted, mitigation measures, i.e. the controlled excavation of the site prior to development, can be implemented. This can only be done by a qualified archaeologist after obtaining a valid permit from the PHRA (or SAHRA, if it is a category 1 site).
- The same action holds true for any infrastructure development such as access routes, construction campsites, trenching, etc. • As stated earlier, people used to settle near water sources. Therefore riverbanks, rims of pans and smaller watercourses should be avoided as far as possible.
- Avoid all patches bare of vegetation unless previously inspected by an archaeologist. These might be old settlement sites.
- Rock outcrops might contain rock shelters, engravings or stone walled settlements, and should therefore be avoided unless previously inspected by an archaeologist.
- Communities living close to the proposed corridor should be consulted as to the existence of sites of cultural significance, e.g. graves, as well as sites that do not show any structures but have emotional significance, such as battlefields, etc.
- All graves or cemeteries should be avoided, unless when totally impossible. The correct procedure, i.e. notification of intent to relocate them, consultation with descendants and permit application, should then be followed in relocating the graves. If any of the graves are older than 60 years, they can only be exhumed by an archaeologist. Graves of victims of conflict requires additional permits from SAHRA before they can be relocated.

- Archaeological material, by its very nature, occurs below ground. The developer should therefore keep in mind that archaeological sites might be exposed during the construction work. If anything is noticed, work in that area should be stopped and the occurrence should immediately be reported to a museum, preferably one at which an archaeologist is available. The archaeologist should then investigate and evaluate the find.
- Any mitigation measures applied by an archaeologist, in the sense of excavation and documentation, should be published in order to bring this information into the public domain.

2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity

The current land use in the area and adjacent areas include:

- Mining;
- Farming; and
- Industrial.

The area is bordered by residential areas. Pockets of open land are available within the boundary of the proposed prospecting area for residential development. However, prospecting will not take place within 100m from any built-up infrastructure and hence no negative impacts are expected. Prospecting at a specific drill site could take one month to six months depending on the geotechnical conditions of the mother rock. MEAHC Environmental and Heritage Consultants is of the opinion that the proposed prospecting activities will not impact on any residential or town planning development.

It is considered that the development will have negligible impact on communities, individuals and competing land use within close proximity to the prospecting activity for the following reasons:

- Any impacts arising from the operation will be minimal and localised. The greatest risks/impacts arising from the operation have been identified as dust deposition and noise. The site is located away from community of and therefore the prospecting operation is considered for practical purposes to be isolated from the nearest large community;
- The prospecting operation will be carried out over a relatively short time period. The impact of noise and dust deposition arising from the operation is therefore considered to be a short-term impact;

- Cumulative impacts have been assessed and are considered negligible; Impacts arising from both dust and noise disturbance are relatively small when compared to the potential impacts of the broader road upgrade project;
- No farmsteads or other communities have been identified within 1.5 kilometres of the site (Figures 5 & 6). An arbitrary 1.5 kilometres radius of the site has been adopted and is considered to be a conservative figure with respect to the spatial extent of impact. The EMP has been developed in consultation with the local community who are aware of the possibility of nuisance noise during the works. Generally it is considered that the long-term benefit of road upgrade outweigh the short-term impacts of noise disturbance. Noise mitigation measures will be implemented to reduce nuisance to an acceptable level.

The proposed operation is not considered to compete for land use for the following reasons:

- The area is bordered by residential areas within a 5km radius. Open land is available within the boundary of the proposed prospecting area for residential development. However, prospecting will not take place within 100m from any built-up infrastructure and hence no negative impacts are expected. Prospecting at a specific drill site could take one month to six months depending on the geotechnical conditions of the mother rock. MEAHC is of the opinion that the proposed prospecting activities will not impact on any residential or town planning development.
- Farming practices on adjacent agricultural land can continue up to the site perimeter undisturbed during the prospecting operation;
- The proposed site footprint is relatively small in the context of the broader othavilleveld which is well represented across the region; and,
- The site will be reinstated to Marikana Bushveld biome for agricultural end use within 2 months of inception of rehabilitation.

2.2.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties

The list of potential impacts summarised in Section 2.2.1 has been compiled with the participation of the landowner and the farming community located within a 1.5 kilometre radius of the site (Figure 3). Written communication describing the proposed activities and the potential impacts arising from the activities was forwarded to all potentially affected parties. A copy of the communications along with comments received is presented in Annexure G.

2.2.6 Confirmation of specialist report appended

A copy of the Heritage Assessment Report and the Ecological Evaluation Report will be presented upon request by relevant authorities.

3. REGULATION 52 (2) (C): SUMMARY OF THE ASSESSMENT OF THE SIGNIFICANCE OF THE POTENTIAL IMPACTS AND THE PROPOSED MITIGATION MEASURES TO MINIMISE ADVERSE IMPACTS.

3.1 Assessment of the significance of the potential impacts

3.1.1 Criteria of assigning significance to potential impacts

The following sections summarise our adopted assessment criteria and the derivation of potential risk and environmental impact severity.

The following provides an overview of the key parameters used for assigning environmental impact severity arising from the prospecting project. This approach is discussed in more detail below.

The criteria and methodology utilised for the impact assessment is illustrated in this report. The impacts are generally assessed in terms of the following criteria:

- Status of the impact (will the impact be positive or negative);
- Probability of the impact to occur;
- Frequency of the impact (temporal scale for example daily or weekly);
- Spatial Extent of the impact (site specific or regional);
- Intensity of Impact (for example severe or beneficial);
- Duration of the impact (long term or short term); and
- Significance of the impact (high, medium or low).

The significance is determined by the following formula:

Status* (Probability + Duration + Extent + Intensity)*Frequency = Significance.

3.1.2 Potential impact of each main activity in each phase, and corresponding significance assessment

It was explained to I&APs that drill sites can only be determined after the conclusion of non-invasive prospecting methods. Prospecting can only be determined on the grant of the prospecting permit by the DMR. It is therefore not possible to do a site specific impact assessment however, the impact assessment as conducted below takes best environmental practices into consideration as well as the prevailing environmental conditions as recorded on site.

Activity: Earth Clearing

Impact	Impact – Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Loss of Biodiversity		-1	2	1	1	1	1	-5.00
	Comment: Earth clearing will be site specific. The size of each drill site will be approximately 20m x 20m. Due to the relative small footprint areas this impact will be of low significance. Only grasses and small shrubs will be removed either by manual labour or by means of mechanical equipment. This impact will most likely also impact on smaller fauna species which cannot mobilise to other areas as quick as larger species.							
	Mitigation: This impact can be mitigated or controlled by ensuring that only the drill site be cleared of vegetation and not the areas surrounding the site. Larger trees should not be cleared. Topsoil cleared from initial earth clearing will be stockpiled for future rehabilitation.							
Loss of Biodiversity	Impact-Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		-1	1	1	1	1	1	-4.00

Impact	Impact – Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Soil Erosion		-1	3	2	2	1	0.8	-6.40
	Comment: Although there is a distinct possibility that this impact will occur the significance is low. The frequency of this impact occurring is rated to be on a frequent (hourly) basis and not daily. This increases the significance of the impact. Rainy and windy days will most probably have a negative impact on the soil cleared of vegetation. This could also extend beyond the drill site boundary.							
	Mitigation: Storm water berms could be constructed during earth clearing phase to divert rain water flowing towards the earth cleared site. Topsoil stockpiles should be covered to prevent rainwater washing away the soil. The impact on the soils beyond the site boundary could be minimised.							
Soil Erosion	Impact-Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		-1	2	1	1	1	0.8	-4.00

Activity: Site Establishment

Impact	Impact – Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Waste Generation		-1	3	1	1	1	1	-6.00

	Comment: During the site establishment phase, domestic and hazardous (hydrocarbons) waste could be generated. This will be as a result of more personnel and mechanical equipment being transported to the site. The significance of this impact is however low. This impact will most likely not extend beyond the site boundary.							
	Mitigation: Mitigation measures should be in place to ensure that correct methods are implemented to remove domestic waste from the site and also to ensure that possible hydrocarbon spills are dealt with in the correct manner not to contaminate the soil. All generated waste should be taken to a registered municipal waste site.							
Waste Generation	Impact- Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		-1	2	1	1	1	1	-5.00

Impact	Impact – Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Soil Contamination		-1	3	1	1	1	0.8	-4.80
	Comment: The significance of this impact is calculated to be low however there is a distinct possibility of the impact occurring. Hydrocarbon spills or leaks from mechanical equipment on site are a possibility. This impact will however be site specific and will most likely occur less than daily.							
	Mitigation: Mechanical equipment used for site establishment should be maintained and serviced regularly to minimise the possibility of this impact occurring.							
Soil Contamination	Impact- Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		-1	2	1	1	1	0.5	-2.50

Impact	Impact – Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Soil Erosion		-1	3	2	2	1	0.8	-6.40
	Comment: Soil erosion during the site establishment is a possibility if soils are left exposed to the elements. Rain events and windy days could increase the possibility of soil erosion on site as well as the immediate areas surrounding the site. Erosion channels could occur on and around the site during a storm event if the management of the water flow is not properly implemented. However the significance of this impact occurring is calculated to be low.							
	Mitigation: Storm water berms should be erected along the boundary of the site to direct water away from the drill site and as far as possible keep the natural drainage of the surface water. Mitigation will reduce the probability and extent of this impact which in turn reduces the impact significance.							
Soil Erosion	Impact- Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		-1	2	1	1	1	0.8	-4.00

Impact	Impact – Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Water Pollution		-1	3	2	3	1	0.5	-4.50

Noise	Impact- Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		-1	1	1	1	1	0.8	-3.20

Activity: Site Rehabilitation

Impact	Impact Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Soil Erosion		-1	2	2	2	1	0.8	-5.60
	Comment: Once all equipment has been removed the sumps can be backfilled and the area levelled with the topsoil as stockpiled during initial earth clearing activities. If the area is backfilled prior to a major rain event soils will wash off into drainage and water systems resulting in the permanent loss of valuable topsoil and sedimentation of rivers and streams as well as erosion gullies. However after rehabilitation of the site and after vegetation has returned to a natural state the impact of soil erosion will be minimised to almost insignificant.							
	Mitigation: Rehabilitation should take place during the dry winter months to ensure the integrity of the soil and will also allow seeds to establish itself on the rehabilitated area and during the summer month's rain will increase the growth of vegetation which will ultimately minimise the impact of soil erosion.							
Soil Erosion	Impact- Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		+1	4	2	3	4	1	+13.00

Impact	Impact Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Flora		+1	4	1	3	4	1	+12.00
	Comment: Along with soil erosion is the associated poor establishment of a vegetation cover which is difficult to rehabilitate after the occurrence of such an impact. This could also impact fauna species as a result of a poor vegetation cover. If the site is properly rehabilitated vegetation will be allowed to establish itself. During the rainy months (summer) vegetation will start to cover the site once again.							
	Mitigation: Rehabilitation of the site should take place during the dry winter months to ensure the integrity of the soil in which vegetation will ultimately grow to a natural state. Seeding programmes can also be introduced.							
Flora	Impact- Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		+1	4	1	4	4	1	+13.00

Impact	Impact Pre Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
Fauna		+1	3	1	3	4	1	+11.00
	Comment: Fauna species will return to the area after rehabilitation provided that the area is rehabilitated well in terms of vegetation establishment.							
	Mitigation: Ensure that the site is well established with vegetation cover and close as possible to the natural state.							

Fauna	Impact- Post Mitigation	Status	Probability	Extent	Intensity	Duration	Frequency	Significance
		+1	4	1	4	4	1	+13.00

3.1.3 Assessment of potential cumulative impacts

Cumulative Impacts were discussed in section 2.2.2 above. Due to the fact that full baseline information is not available for the region it is not possible to assess the cumulative impacts based on a quantitative scale but rather on a qualitative scale.

Cumulative impacts, should they occur, have been assessed as indicated in the table below. It should be noted that cumulative impacts will only occur should site specific impacts occur and no mitigation be employed or be effective. Based on the nature of prospecting activities it is unlikely that significant cumulative impacts will occur.

Table 5: Cumulative impact table

Impact	Cumulative Impact Rating	Mitigation
Surface water	Low to Medium Low	Mitigation is possible at source which will reduce the likelihood of the occurrence of this cumulative impact
Groundwater	Low	Mitigation is possible at source which will reduce the likelihood of the occurrence of this cumulative impact
Sedimentation of Wilge River	Low to Medium Low	Mitigation is possible however should this impact occur during the rainy season and no mitigation is in place this cumulative impact will occur.
Soil erosion	Low	On a regional to national scale this impact, should it occur, will have a low significance. Mitigation is possible
Introduction of Alien species	Low to Medium Low	Alien species can be introduced by equipment brought onto site. Should this impact occur all site could be vulnerable to invasive alien species. Mitigation is possible.

Impact	Cumulative Impact Rating	Mitigation
Elevated noise levels	Low	Should noise levels exceed 50dBA during daytimes and 40dBA during night times a cumulative impact might be experienced. This impact might be muffled by the existing ambient noise levels generated within the Aggregate and Sand Mine Limited and the Rosslyn Industrial area located nearby and the local provincial roads. Mitigation is possible by limiting operations to daytime hours especially close to residential areas to the south of the prospecting area.

3.2 Proposed mitigation measures to minimise adverse impacts

The mitigation measures for each impact were discussed in section 3.1.2 above after the assessment of each impact.

3.2.1 List of actions, activities, or processes that have sufficiently significant impacts to require mitigation

Prospecting via diamond core drilling methods has limited and low impacts on the environment. All impacts are considered to be of low significance if assessed in accordance with the methodology provided.

The impacts with the highest significance are most probably probable surface water contamination, possible elevated noise levels in the area and soil contamination. Surface water and soil contamination could occur as a result of the drill fluid or liquid which is circulated throughout the drilling process. The liquid is essentially contaminated water (traces of hydrocarbons) utilised to cool the drill.

Water could spill into the environment if not managed correctly. The mitigation measures identified is seen as standard practice and includes the placement of a plastic liner on all temporary sumps as well as cleaning the water continually i.e. hydrocarbon separation from water. A trench could also be dug around the prospecting site that will further reduce the

possibility of dirty water run-off from the site. Bioremediation techniques could be employed to rehabilitate possible contaminated soils.

Elevated noise levels in the area could also be of concern however the significance of the impact is calculated to be low. To even further reduce the noise impact, no drilling will take place during night-time hours. All drilling will take place during the day time and noise levels will not exceed the recommended 50dBA for day time operations. Another impact, which could occur through all three phases of the project, is soil erosion. Mitigation measures should include the following:

3.2.2 Concomitant list of appropriate technical or management options

The prospecting method will have low to medium-low impacts on the receiving environment. Prospecting sites to be impacted will be small however, in the event of an impact occurring the following should be done:

- In the event of a major spill, for example an oil spill, all prospecting operations should be stopped and the spill be cleaned immediately. In the event of any hydrocarbon spill bioremediation measures should be employed to clean contaminated soil via the correct bioremediation procedures.
- Should the site show evidence of soil erosion daily inspection, monitoring and remediation will be required. In the event of topsoil erosion, soil should be placed back onto the topsoil dump with additional mitigation measures to be employed i.e. trenching or placement of larger plastic liner over topsoil dump.
- Noise pollution could be a significant impact. Should any complaints be received from the public, drilling should stop. It is however highly unlikely that any complaints on elevated noise levels during the daytime will be experienced.
- Should any subsurface burial sites be uncovered during the prospecting operations, operations should cease until a certified archaeologist has investigated the site and proposed mitigation measures are put in place to preserve the site.

For detailed mitigation measures on each identified impact refer to section 3.1.2.

3.2.3 Review the significance of the identified impacts

Please refer to section 3.1.2 where impacts were assessed before and after mitigation. The mitigation measures are also discussed.

4. REGULATION 52 (2) (D): FINANCIAL PROVISION. THE APPLICANT IS REQUIRED TO-

4.1 Plans for quantum calculation purposes

Refer to Annexure A which outlines the proposed prospecting area. Invasive and Non-invasive prospecting methods will identify possible or future mining areas. It is currently anticipated that there will be between 4 to 6 drilling sites with proposed sixteen (10) holes ranging between the depths 150 – 400 m deep, totalling 4000 meters. These sites will be approximately 20m x 20m and will require rehabilitation and monitoring.

Rehabilitation will be site specific surface area rehabilitation.

4.2 Alignment of rehabilitation with the closure objectives

In order to align rehabilitation initiatives with the closure objectives it is imperative to firstly define the closure objectives. Closure objectives are defined as follow:

- The holder of a prospecting permit must, as far as it is reasonably practicable, rehabilitate the environment affected by the prospecting operations to its natural or predetermined state, or to a land use which conforms to the generally accepted principle of sustainable development, through: restoration, remediation, rehabilitation, and stabilisation;
- Correct allocation of closure funds according to the closure plan and ensure adequate financial provision;
- To ensure that good water quality is maintained on site; and
- Monitoring will continue until such a time that it can be proven that there are no more negative impacts on the environment and site closure can be achieved.

In line with the above objectives rehabilitation will include:

- All evidence of impacts associated with or resultant to prospecting should be rehabilitated;
- Sites should be left waste free and stable;
- Soil/surface rehabilitation must be conducted in such a way as to ensure that the site is left stable with no further impacts relating to soil erosion;
- The topography of the disturbed area should be reinstated to its former natural state as far as possible.
- Monitoring on the success of rehabilitation i.e. vegetation establishment, should be conducted regularly (at least monthly) to ensure that the sites have been rehabilitated successfully; and
- Should rehabilitation prove not to have been successful additional a fertilisation and seeding programme must be followed by a qualified ecologist.

4.3 Quantum calculations

Once all equipment and personnel has been removed from a particular prospecting/drilling site the site will have to be levelled for surface rehabilitation to commence. A costing for such surface rehabilitation and a Quantum Calculation is attached as Annexure H. General surface rehabilitation will include levelling of areas, ripping of compressed soils and grassing of areas.

4.4 Undertaking to provide financial provision

Should the authorisation for the proposed project be granted it is anticipated that for the successful completion of the project an estimated amount of R40, 396.00 will be required.

The amount provided above will be made available as a Bank Guarantee on approval of this EMP.

5 REGULATION 52 (2) (E): PLANNED MONITORING AND PERFORMANCE ASSESSMENT OF THE ENVIRONMENTAL MANAGEMENT PLAN

5.1 List of identified impacts requiring monitoring programmes

1. Soil Erosion
2. Probable Establishment of Alien Vegetation
3. Surface Water (only if prospecting is conducted in close proximity to the Wilge River, or any other natural watercourses)
4. Heritage Landscape

5.2 Functional requirements for monitoring programmes.

1. Soil Erosion
 - a. Daily site inspection by site manager
 - b. Daily routes (or as often as required) of soil pick-up to ensure
 - c. than no topsoil erodes off the prospecting sites
 - d. Maintenance of soil erosion trenches
2. Probable Establishment of Alien Vegetation
 - a. Weekly monitoring of probable alien vegetation establishment
 - b. Monthly inspection by qualified ecologist
 - c. Eradication of alien species as often as required
3. Surface Water (only if prospecting is conducted in close proximity to the Wilge River, or any other natural watercourses)
 - a. Monthly surface water sampling only if prospecting activities are located in close proximity to the Wilge River, or any other natural watercourses.
 - b. Water sampling to be conducted for probable hydrocarbon pollution and sedimentation (i.e TDS and EC).
1. Heritage Landscape
 - a. Heritage Management Plan which includes basic training for construction staff on possible finds, action steps for mitigation measures, surface collections, excavations and communication routes to follow in the case of a discovery.

5.3 Roles and responsibilities for the execution of monitoring programmes

1. Soil Erosion
 - a. Site officer/manager (daily – weekly)
 - b. Environmental Officer or specialist (monthly)
2. Probable Establishment of Alien Vegetation
 - a. Site officer/manager (weekly)
 - b. Qualified ecologist (one month after site rehabilitation)
1. Surface Water (only if prospecting is conducted in close proximity to Wilge River, or any other natural watercourses)
 - a. Environmental specialist (this will require sampling and results interpretation by means of a reporting standard)
1. Heritage Landscape
 - a. Compilation of a mini Heritage Management Plan by a qualified Archaeologist and the regular monitoring on site by an Environmental Control Officer (ECO).

5.4 Committed time frames for monitoring and reporting

Performance monitoring and reporting will be conducted once per annum as prescribed by the DMR. General environmental monitoring will be continuous throughout the prospecting operations.

6 REGULATION 52 (2) (F): CLOSURE AND ENVIRONMENTAL OBJECTIVES.

6.1 Rehabilitation plan

The locations of prospecting areas are yet to be determined. It is therefore not possible to generate such plan. On completion of the non-invasive prospecting phase drilling sites will be identified. On request the DMR will be provided with a copy of such a plan.

From a rehabilitation point of view, all sites will be rehabilitated, as far possible, to its former natural state.

6.2 Closure objectives and their extent of alignment to the pre-mining environment

Refer to closure objective in section 4.2 of this report.

- The site will be rehabilitated to allow for natural vegetation to establish.
This is generally accomplished by good preservation of topsoil which is generally fertile soils and contains a significant amount of natural seeds.
- Trees will not be uprooted however, smaller shrubs may be removed.
- The general topography will be maintained where possible but will be reinstated during rehabilitation.
- Rocky areas will be avoided (as these are also associated with sensitive habitats).
- Alien species will be monitored and where possible existing alien species will be eradicated during the cause of prospecting.
- Minimal disturbance to subsoil will assist with accomplishing a pre-mining/ prospecting environment.

6.3 Confirmation of consultation

Environmental objectives, in relation to closure and rehabilitation of drillings, have been developed in consultation with all interested and affected parties. Section 1.4 provides a detailed description of all stakeholders involved in the consultation process. The Environmental company (MEAHC), conducted the public consultation on this application. As the area consists of few formal and informal settlements i.e. urban extensions, it was thought best to adapt the consultation process in order to advertise and consult with the wider community. The process followed is described below.

The consultation process with I&APs commenced in December 2015 with a site visit to the area. The consultation process included the distribution pamphlets and site notices (A4 in size), flyers and distribution of Background Information.

The advertisement, site notices and BIDs indicated that an application for a prospecting right has been submitted to the DMR and that the prospecting operations will be by means of Core Borehole Drilling.

Consultation process with Affected Parties commenced on December 2014. The consultation process included the distribution of Background Information.

The prospecting process and associated activities was explained as well as possible environmental and socio-economic impacts associated with the prospecting process.

A copy of the draft EMP was provided to all I&APs registered on the project database for their comment and input.

7 REGULATION 52 (2) (G): RECORD OF THE PUBLIC PARTICIPATION AND THE RESULTS THEREOF

7.1 Identification of interested and affected parties

7.1.1 Name the community or communities identified, or explain why no such community was identified

The prospecting area applied for is in extent of 6,343.592886 hectares and is situated on the farms Klipfontein 268 JR (excluding portion 1), the farm Honingnestkrans 269 JR, the farm Haakdoornboom 267 JR, portion 3, 5, 6 and the remaining extent of the farm Westzelrust 223 JR, the farm De Onderstepoort 300 JR (Excluding 10, 45, 73, 75, 76, 77, 78, 82, 83, 86, 87, 88, 100, 101, 102, 103, 104, 105, 138, 139, 140, 142 and 100 of the farm De Onderstepoort 300 JR) in the Pretoria District, Gauteng Province.

The communities that are located within a 5 km radius from the proposed prospecting site are: Amalinda, Honingnestkranz, Bon Accord, Klipfontein, Kruisfontein, Iswelethu, Rosslyn, Onderstepoort, Soshanguve A, Soshanguve XX, Soshanguve WW and Soshanguve South

Table 6: communities identified

Town/Community	Distance (km)	Direction From Project
Soshanguve South	Borders	North
Soshanguve East	Borders	North and West
Soshanguve A	Borders	East
Onderstepoort	Borders	East
Montana and Doornpoort	5 km	South and East
Ga-Rankuwa Unit 2	1.5 km	West
Ga-Rankuwa Unit 3	2.5 km	West
Ga-Rankuwa Unit 6	1 km	West
Ga-Rankuwa Unit 7	2 km	North-West

7.1.2 Specifically state whether or not the community is also the landowner

Refer to Annexure G: Overysel Interested and Affected Parties Database: for a list of the various landowners in the area.

7.1.3 State whether or not the Department of Rural Development and

The Regional Land Claims Commission Gauteng Province (via e-mail and registered post), and the Land Reform Office, and the National Department of Rural Development and Land Reform Directorate were identified as interested and affected parties. Results of consultation are awaited.

7.1.4 State specifically whether or not a land claim is involved

A land claim is not involved in this process.

7.1.5 Name the Traditional Authority identified

The farmers, government departments and private land owners has been identified as an interested party and forms part of the stakeholder engagement process. The consultation process with the community has been conducted successfully at the local.

7.1.6 List the landowners identified by the applicant (Traditional and Title Deed owners)

A full list of all the landowners identified is attached in Annexure D of this document.

7.1.7 List the lawful occupiers of the land concerned

The land is currently designated as unoccupied and sporadic agricultural land.

7.1.8 Explain whether or not other persons (including on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed prospecting or mining operation and if not, explain why not

It is considered that the proposed prospecting operation will not directly affect the socioeconomic conditions of any person (other than the current land owner) for the following reasons:

The size of the operation is relatively small-scale; minimal environmental impacts and environmental receptors have been identified within 1.5 kilometres of the;

- The duration of the operation is over a relatively short timescale.
- Adjacent land use has been identified as agricultural. Farming practices will be able to continue uninterrupted to the site perimeter;

- Land use within 20 kilometres of the site has been identified as agricultural;
- Operations will not directly impact on users of the R101 Road;
- Operations will not impact on water resources;
- Operations will have minimal impact on local air quality; and,
- A 24 hour security presence will be onsite for the duration of the works and will ensure security of site equipment, site boundary fences and proximal and adjoining land. Refer to Section 2.2.4 for further detail.

7.1.9 Name the local Municipality

The local municipality is: Tshwane Local Municipality

7.1.10 Name the relevant government departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project

Relevant government departments, regulatory bodies identified as interested parties have been identified in Section 1.4. These are:

- Gauteng Provincial Government, Department: Public Works; Roads and Transport;
- Department of Mineral Resources (DMR);
- Department of Economic Development, Environment, Conservation & Tourism (DEDECT);
- Tshwane Metro Local Municipality;
- Tshwane Magisterial District

7.1.11 Submit evidence that the landowner or lawful occupier of the land in question, and any other interested and affected parties including all those listed above were notified

The public meetings were also held with the interested parties. All identified interested and affected parties are discussed in Section 1.4. Letters of notification of the proposed works were issued to all identified stakeholders and copies are presented in Annexure D.

7.2 The details of the engagement process

7.2.1 Description of the information provided to the community, landowners, and interested and affected parties

Information provided to the community and interested and affected parties is summarised as follows:

- Written notification to all landowners, local municipalities and government institutions;
- Notice of intent erected on each site location; and,
- Personal visits and communication to landowners and neighbours identified as interested and affected parties.

Copies of all notification are presented in Annexure D and a copy of notice of intent is presented in Annexure C.

7.2.2 List of which parties identified in 7.1 above that were in fact consulted and which were not consulted

The farmers, government department and private land owners were consulted. The public meetings were also held with the interested parties. All interested parties listed in Sections 1.4 and 7.1.11 were consulted during the stakeholder engagement process.

7.2.3 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment

Refer to Annexure C and Annexure D (Meeting Minutes) for a list of issues raised during the stakeholder engagement process.

7.2.4 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation

Refer to C and Annexure D (Meeting Minutes) for a list of issues raised during the stakeholder engagement process.

7.2.5 Other concerns raised by the aforesaid parties

Refer to C and Annexure D (Meeting Minutes) for a list of issues raised during the stakeholder engagement process.

7.2.6 Confirmation that minutes and records of the consultations are appended

The farmers, government department and private land owners were consulted. The public meetings were also held with the interested parties. A record of all meetings undertaken with the

interested and affected parties (discussed in Sections 1.4 and 7.1.11) are presented in C and Annexure D.

7.2.7 Information regarding objections received

No objections to the proposed works have been received to date.

7.3 The manner in which the issues raised were addressed

No objections to the proposed works have been received to date.

8 SECTION 39 (3) (C) OF THE ACT: ENVIRONMENTAL AWARENESS PLAN

8.1 Employee communication process

The Applicant has developed Environmental, Health and Safety Policies. The Environmental Policy will be communicated to all personnel (contract or permanent staff). In addition the policy will be erected at each active prospecting site.

Employees will receive general environmental awareness training on specific items contained in this EMP as well as on Best Possible Environmental Practices (BPEP).

The following outlines our approach for communicating environmental risk and promoting risk awareness at all levels within the project team. This approach is overarching and applied to both full time and part time staff, contractors and subcontractors and site visitors.

- **Site induction** – All employees and site visitors are required to attend a site induction.
The induction process covers both health and environmental risk and ensures that all parties are aware of the project HSE objectives and company and individual responsibilities in achieving these goals.
- **Toolbox talks** – will be provided to all staff on a routine basis to ensure that they remain aware of project goals, are informed of newly identified risk resulting from changes in project scope, methodology or changing environmental conditions. The Toolbox talks will provide individuals with an opportunity to ask questions raise HSE issues and report unsafe actions, behaviour or conditions. The meetings will also provide all parties with an opportunity for recommendations to improve on existing environmental procedures.
- **Formal reporting procedures** – will be implemented for the reporting of environmental incidents, accidents and near misses;
- **Environmental emergency response procedures** – will be developed for the rapid and safe management of environmental risk. It is envisaged that these will focus on nuisance

dust management and management of fuel and fuel oil spillage. Emergency response procedures will be available for view on site and will be discussed during site induction;

- **Job Hazard Assessments (JHA), Risk Assessment and Method Statements** – will be developed for all site operations. These will consider the potential impact (and management of impact) on the environment arising from individual job tasks.

8.2 Description of solutions to risks

Each possible risk item (i.e. potential impact) has been identified in this report. For each impact or risk a mitigation measure was proposed. If employees are trained on these measures risk/impacts will be reduced.

Environmental risks arising from specified operations, jobs and job tasks will be identified during an initial Job Hazard Assessment and appropriate Risk Assessments and Method Statements will be developed to reduce and appropriately manage the resulting residual risk.

All works will be carried out in accordance with the specified method statement and in accordance with the requirements of the broader EMP. Where a change to job methodology risk assessments appropriately revised to capture and reflect the changes. Where these changes or risks are considered significant, they will be communicated to the project team via Toolbox Talks. All team members will be conversant with emergency response and incident reporting procedures and the implementation thereof in the event of an environmental incident.

The key risks identified within this EMP are dust generation from the prospecting operation, accidental spillage of fuel and fuel oil and fugitive exhaust emissions. Evaluation of risk associated with these hazards and the proposed mitigation options to reduce and effectively manage environmental risk are presented in Section 3.1.2, Table 5 and Section 3.2.2, Table 5. or working practice is required, re-evaluation of environmental risks will be carried out and risk assessments appropriately revised to capture and reflect the changes. Where these changes or risks are considered significant, they will be communicated to the project team via Toolbox Talks. All team members will be conversant with emergency response and incident reporting procedures and the implementation thereof in the event of an environmental incident.

The key risks identified within this EMP are dust generation from the prospecting operation, accidental spillage of fuel and fuel oil and fugitive exhaust emissions. Evaluation of risk associated with these hazards and the proposed mitigation options to reduce and effectively manage environmental risk are presented in Section 3.1.2, and Section 3.2.2.

8.3 Environmental awareness training

Training will be done to make employees and contractors aware of:

- The importance of conforming with the environmental policy and procedures and with the requirements of the environmental management plan (EMP);
- The significant social and environmental impact of their work activities and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- The potential consequences of departure from specified operating procedures; and
- Possible archaeological finds, action steps for mitigation measures, surface collections, excavations and communication routes to follow in the case of a discovery.

The guidelines for training are summarised in the table below, which are in line with the ISO 14001:2004 guidelines with regards to training and awareness creation.

Table 7: Guidelines for training

Types of training	Audience	Purpose
Raising awareness of the strategic importance of environmental management	Senior management	To gain commitment and alignment to the organisation's environmental policy.
Raising general environmental awareness	All employees	To gain commitment to the environmental policy, objectives and to instil a sense of individual responsibility.
Skills enhancement	Employees with environmental responsibilities	To improve performance in specific tasks.
Compliance	Employees whose actions can affect compliance	To ensure that regulatory and internal requirements for training are met.

The In-house and on the job environmental awareness training will be provided to all site personnel as required and at a level that is appropriate to previous experience and position within

the project team. This would most likely be accomplished through toolbox talk and routine HSE briefing sessions. It is envisaged that training will include (but may not be limited to):

- General environmental awareness and hazard spotting;
- Emergency response and incident reporting procedures;
- Proper use of emergency response equipment and risk mitigation measures e.g., spill kits, fire extinguishers dust suppression;
- Proper use of spillage containment equipment e.g., drip trays and bunding
- Good housekeeping and safe working practices e.g., appropriate fuel, oil and chemicals storage and appropriate fuelling practices; and,
- The importance of routine equipment inspection, maintenance and repair.

9 SECTION 39 (4) (A) (III) OF THE ACT: CAPACITY TO REHABILITATE AND MANAGE NEGATIVE IMPACTS ON THE ENVIRONMENT

9.1 The annual amount required to manage and rehabilitate the environment

The Principal Contractor appointed by Ntsika Mining Advisory (Pty) Ltd will be required to (under the project terms of reference) capture the cost of environmental management and rehabilitation within the final project bill of quantities. The principal contractor should consider the following as a minimum environmental management requirement for costing purposes:

- Development of emergency response procedures document;
- Appropriate waste disposal;
- Safety equipment – fire extinguishers, spill kits, drip trays etc;
- Water bowser or alternative for dust suppression (as required);
- Hire of dust monitoring equipment;
- Noise monitoring (as required);
- Lab analysis on dust samples;
- Evaluation of data and reporting;
- Re-grading and reshaping of site and reestablishment of top soil;
- Re-vegetation planting;
- Initial inspection of completed site by ecologist;
- Visits by ecologist to monitor plant growth progress; and,
- Final ecologists close out report.

The closure amount is calculated to be R40, 396.00 for the entire prospecting operation. Assumed that the prospecting will be conducted over a 3 – 5 year period the amount to be made available

per annum for rehabilitation is calculated to be minimum R8,079.20 and maximum R13,465.33 per annum.

9.2 Confirmation that the stated amount correctly reflected in the Prospecting Work Programme as required

In accordance with regulatory requirements; adequate financial provision will be included in the project budget for appropriate environmental management of the site and prescribed operations, and, for post-closure rehabilitation of a prospecting site. The above amount was not included in the PWP as submitted. An accurate determination is presented above.

8 REGULATION 52 (2) (h): Undertaking to execute the environmental management plan.

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

Full Names and Surname	Plaatjie Khonziwe
Identity Number	770924 5795 082

-END-