

**BASIC ASSESSMENT REPORT FOR THE PROPOSED  
PROSPECTING ACTIVITIES ON VARIOUS FARMS, IN THE  
MAGISTERIAL DISTRICT OF BLOUBERG AND MOGALAKWENA,  
LIMPOPO PROVINCE**

For

**Sylvania Northern Mining (Pty) Ltd**

For the following Minerals:

**Chrome Ore, Cobalt, Copper Ore, Gold Ore, Nickel Ore, Platinum Group Metals**

Located on the Farms:

**Altona 696 LR, Gillemberg 861 LR, Non Plus Ultra 683 LR, Teneriffe 682 LR,  
Aurora 397 LR and Nonnenwerth 421 LR,**

in the Magisterial Districts of there  
**Blouberg and Mogalakwena,  
Limpopo Province**

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**Title:**

Basic Assessment Report for the Proposed Prospecting activities on various farms in the District of Blouberg and Mogalakwena, Limpopo Province for Sylvania Northern Mining (Pty) Ltd

**Client:**

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## mineral resources

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

### **BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

Basic Assessment Report for the proposed prospecting activities for Sylvania Northern Mining (Pty) Ltd for the following Minerals: Chrome Ore, Cobalt, Copper Ore, Gold Ore, Nickel Ore, Platinum Group Metals. The proposed activities will be located on farms Altona 696 LR, Gillemberg 861 LR, Non Plus Ultra 683 LR, Teneriffe 682 LR, Aurora 397 LR and Nonnenwerth 421 LR, in the Magisterial Districts of Blouberg and Mogalakwena, Limpopo Province.

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

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**DMRE REFERENCE NUMBER:** LP30/5/1/1/2/14710PR



## IMPORTANT NOTICE

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

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

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

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

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

## OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
  - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - (ii) the degree to which these impacts—
    - (aa) can be reversed;
    - (bb) may cause irreplaceable loss of resources; and
    - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
  - (i) identify and motivate a preferred site, activity and technology alternative;
  - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
  - (iii) identify residual risks that need to be managed and monitored.

## EXECUTIVE SUMMARY

Sylvania Northern Mining (Pty) Ltd is proposing to conduct prospecting activities for Chrome Ore, Cobalt, Copper Ore, Gold Ore, Nickel Ore, Platinum Group Metals. The proposed activities will be located on the farms Altona 696 LR, Gillemberg 861 LR, Non Plus Ultra 683 LR, Teneriffe 682 LR, Aurora 397 LR and Nonnenwerth 421 LR, in the Magisterial Districts of Blouberg and Mogalakwena, Limpopo Province. The proposed prospecting activities will include the following activities as described below.

- **Non-Invasive Activities:** Non-invasive activities include investigation of academic data, liaise with communities, conducting inventories and a preliminary site visit and assessment, logging and evaluation of data obtained from the invasive activities.
- **Invasive Activities:** will consists of ground geophysics and soil chemistry, exploration borehole drilling and trenching.

### Listed Activities:

The proposed activities will trigger the following NEMA Listed Activities:

<b>NAME OF ACTIVITY</b> <i>(E.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route)</i>	<b>AERIAL EXTENT OF THE ACTIVITY</b> Ha or m <sup>2</sup>	<b>LISTED ACTIVITY</b> <i>(Mark with an X where applicable or affected).</i>	<b>APPLICABLE LISTING NOTICE</b>	<b>WASTE MANAGEMENT AUTHORIZATION</b> <i>(Indicate whether an authorization is required in terms of the Waste Management Act). (Mark with an X)</i>
Drill Site	10 m x 10 m Drill Sites 1 Drill site= 100 m <sup>2</sup> Total Drill Site Areas (6) = 600 m <sup>2</sup>	X	GNR 983 (as amended 07 April 2017) Listed Activity 20	
Trenching	25 m x 2 m Trench Sites 1 Trench = 50 m <sup>2</sup> Total Trench Areas (25) = 1200 m <sup>2</sup>	X	GNR 983 (as amended 07 April 2017) Listed Activity 20	
Rehabilitation and Closure	1800 m <sup>2</sup>	X	GNR 983 (as amended 07 April 2017) Listed Activity 31	

### Impacts identified

The findings are that the proposed prospecting activities will result in Low to Medium-High impact for the various physical and socio-economic aspects of the environment before the implementation of the identified mitigation / management measures and a Low to Medium impact following mitigation / management measures implementation. A summary of the positive and negative impacts of the proposed activity are provided in Table below.

**Table A: Positive and Negative impacts and the phases (C=Construction/Site Establishment; O=Operational; R=Rehabilitation; Cl= Closure; D=Decommissioning)**

<b>Aspect</b>	<b>Activity</b>	<b>Activity</b>	<b>Impact</b>	<b>Phase</b>
Topography	All prospecting activities	All prospecting activities	Impact on topography that result in water ponding - area not free-draining	C, O, R, Cl
Geology	All prospecting activities	All prospecting activities	Sterilisation of mineral resource as a result of prospecting activities.	C, O, R, Cl

Aspect	Activity	Activity	Impact	Phase
Groundwater	All prospecting activities	All prospecting activities	Impact on groundwater quality as a result of hydrocarbon spills from machinery.	C, O, R, CI
Groundwater	All prospecting activities	All prospecting activities	Impact on groundwater levels	C, O, R, CI
Air quality	All prospecting activities	All prospecting activities	Dust generated as a result of the prospecting activities including travelling on road could impact on local PM10 levels.	C, O, R, CI
Noise	All prospecting activities	All prospecting activities	The operation of machinery could result in increased noise levels in an area that is rural in nature. This noise could become a nuisance to the residents.	C, O, R, CI
Socio-Economic	All prospecting activities	All prospecting activities	(+) Very few employment opportunities will be created during prospecting. However, it is anticipated that a few (<10) could be created that will result in a positive economic impact.	C, O, R, CI
Socio-Economic	All prospecting activities	All prospecting activities	The proposed prospecting activities could create awareness of the area by people seeking employment and result in people moving to the area in case of future employment opportunities should the mineral be viable for full scale mining. This could negatively affect the existing social aspects of the area and impact on the sustainability of services such as schools, clinics, police etc.	C, O, R, CI
Surface water quality	Ground geophysics and soil geochemical sampling	Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C
Surface water quality	Ground geophysics and soil geochemical sampling	Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O
Surface water quality	Ground geophysics and soil geochemical sampling	Topsoil stockpiling/ Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Ground geophysics	Replace topsoil	Silt generation during rainfall events could reach surface	R

Aspect	Activity	Activity	Impact	Phase
	and soil geochemical sampling		water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	
Surface water quality	Ground geophysics and soil geochemical sampling	Replace topsoil	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	R
Surface water quality	Trenching	Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C
Surface water quality	Trenching	Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O
Surface water quality	Trenching	Topsoil stockpiling/ Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Trenching	Overburden stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O
Surface water quantity	Trenching	Containment of rainwater in trench	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	O
Surface water quality	Trenching	Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O
Surface water quality	Trenching	Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	C, O

Aspect	Activity	Activity	Impact	Phase
Surface water quality	Trenching	General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	C, O
Surface water quality	Resource drilling: drill pad and sump	Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O
Surface water quality	Resource drilling: drill pad and sump	Drilling sludge	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	O
Surface water quality	Resource drilling: drill pad and sump	Vegetation removal & General activities	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Resource drilling: drill pad and sump	Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C
Surface water quantity	Resource drilling: drill pad and sump	Operation of drill pad sump	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	O
Surface water quality	Resource drilling: drill pad and sump	Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	C, O
Surface water quality	Resource drilling: drill pad and sump	Capping of Borehole	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R
Surface water quality	Resource drilling: drill pad and sump	Rip impacted area	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the	R





Aspect	Activity	Activity	Impact	Phase
			physico & chemical quality of the water in the watercourse.	
Surface water quality	Resource drilling: drill pad and sump	Rip impacted area	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	R
Surface water quality	Resource drilling: drill pad and sump	General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	C, O
Surface water quality	Access road	Vegetation removal (all access roads combined)	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C
Surface water quality	Access road	Daily travelling to prospecting site	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Access road	Daily travelling to prospecting site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O
Surface water quality	Access road	Rip road area	Silt generation during rainfall events could reach surface water resources result in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R
Surface water quality	Prospecting activities (all)	Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quality as a result of hydrocarbon spills and siltation from run-off.	C, O
Surface water quantity	Prospecting activities (all)	Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quantity; however, it is expected that the boreholes and trenching will be done consecutively thus the	O

Aspect	Activity	Activity	Impact	Phase
			impact severity should not increase from that of the individual activities.	
Surface water quality	Prospecting activities (all)	Cumulative impact: Big area (Areas 1, 2, 3 and 4)	During the rehabilitation phase water quality could be impacted as a result of hydrocarbon spills and from siltation from ripped areas that are not vegetated.	R
Heritage and Archaeological	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on open-air Stone Age sites that could be found in the area, most likely in the form of individual stone tools or small scatters. The possibility of Iron Age sites (especially stone-walled Late Iron Age sites) in the areas can also not be excluded, although this is less likely	C, O
Heritage and Archeologically	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on Iron Age sites (especially stone-walled Late Iron Age sites) although this is less likely than Stone Age sites.	C,O
Heritage and Archeologically	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on recent historical sites and features as the possibility of their presence the area is High, and will most be represented by the remnants of individual homesteads and rural settlements.	C,O
Heritage and Archeologically	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on both formal & informal cemeteries, individual graves and even previously unknown & unmarked graves.	C,O
Terrestrial biodiversity	Development activities	Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities will lead to destruction and damage of habitats and vegetation communities and overall loss of biodiversity and ecosystem function within the clearance and operational area. Destruction of habitat may lead to faunal species migrating to other more favourable areas.	O
Terrestrial biodiversity	Development activities	Drilling, Roads, Trenching and geochemical sampling	The continuous human activity over a longer-term period may further impact on the faunal communities within the area. Associated noise, waste, the smell of humans and physical infiltration into remaining natural areas are problematic and may lead to declining populations	O



Aspect	Activity	Activity	Impact	Phase
			(where the disturbance of habitat has caused habitat remaining to become unfavourable).	
Terrestrial biodiversity	Development activities	Vegetation clearance	Vegetation clearance will destroy indigenous vegetation and lead to possible invasive and/or exotic species establishing in the area and edge-effects occurring surrounding the prospecting activities. Bare areas may become vulnerable to Alien and Invasive Plant species and these may compete with indigenous species, likely leading to the migration of sensitive species from the site to a more favourable habitat.	C, O
Terrestrial biodiversity	Development activities	Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities may impact on areas designated as high sensitivity, including critical biodiversity areas and watercourses situated in and around the Prospecting Right area. The majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 are located on areas categorised as CBA. The layout of the prospecting target areas appears to have been designed to avoid most of the non-perennial tributaries. The activity may lead to the loss of species of conservation concern. Based on the desktop study findings, no flora SCC are considered to be likely to occur on the project area. However, fifteen (15) faunal species previously recorded in the area queried are categorised as SCC.	O
Terrestrial biodiversity	Development activities	Rehabilitation	Rehabilitation could be ineffective if rehabilitation actions are not effectively implemented. Without the necessary mitigation measures, rehabilitation will be less successful and the ecology of the impacted areas may not recover to a pre-prospecting state. Without mitigation the alien invasive species may increase	CI, Post CI

Aspect	Activity	Activity	Impact	Phase
			and result in a degraded veld condition making the property less viable for post-closure land use activities such as wilderness, grazing and agriculture.	
Soil, Land Use and Land Capability	All	Soil stripping	Soil Erosion	C
Soil, Land Use and Land Capability	All	Vehicles driving on the soil surface	Compaction and loss of soil structure	C
Soil, Land Use and Land Capability	All	Spillages of hydrocarbons	Soil pollution and contamination	C
Soil, Land Use and Land Capability	All	Soil stripping	Soil Erosion	O
Soil, Land Use and Land Capability	All	Soil Stripping / Trenching and Drilling	Dilution of topsoil through mixing with subsoil; Loss of topsoil as a resource	O
Soil, Land Use and Land Capability	All	Soil Stripping / Trenching and Drilling	Decline in organic matter & biological activity	O
Soil, Land Use and Land Capability	All	Soil Stripping /Trenching and Drilling	Loss of water holding capacity	O
Soil, Land Use and Land Capability	All	Vehicles driving on the soil surface	Compaction and loss of soil structure	O
Soil, Land Use and Land Capability	All	Soil Stripping / Trenching and Drilling	Loss of land capability and land use	O
Soil, Land Use and Land Capability	All	Spills from vehicles, accidental spills of hazardous chemicals	Soil pollution and contamination	O
Soil, Land Use and Land Capability	All	Stockpiling of Soil	Loss of Topsoil as a Resource: Compaction and Erosion	Cl, R
Soil, Land Use and Land Capability	All	Backfilling of soil material layers	Loss of land capability	Cl, R

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## Abbreviations

%	Percentage
ADI	Area of direct influence
ADU	Animal Demographic Unit
All	Area of indirect influence
AIP	Alien Invasive Plant
Au	Gold
BAR	Basic Assessment Report
BMS	Base-metal Sulphide
CA	Competent Authority
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species
Co	Cobalt
Cr	Chrome
Cu	Copper
DAFF	Department of Agriculture, Forestry and Fisheries
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department Of Mineral Resources and Energy
DWAF	Department of Water Affairs and Forestry
E.g.	Example
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
ESA	Ecological Support Area
FEPA	Freshwater Ecosystem Priority Area
GNR	Government Notice Regulation
Ha	Hectare
I&AP	Interested and Affected Party
IBA	Important Birding and Biodiversity Area
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IUCN	International Union for Conservation of Nature and Natural Resources
Km	Kilometres
km <sup>2</sup>	Square kilometres
LC	Least Concern
LCP	Limpopo Conservation Plan
LEMA	Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003)
LM	Local Municipality
m	Meters
m <sup>2</sup>	Square metres
MAR	Mean annual runoff
mm	Millimeters
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NEMWA	National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)
NFA	National Forests Act, 1998 (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
Ni	Nickel
NNR	No Natural Remaining

No.	Number
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act, 1998 (Act No. 36 of 1998)
°C	Degrees Celsius
ONA	Other Natural Area
PES	Present Ecological Status
PFS	Pre-Feasibility study
PGM	Platinum Group Metals
POSA	Plants of Southern Africa
PPP	Public Participation Process
Pri.Sci.Nat	Principal Natural Scientist
PWP	Prospecting Works Programme
QA/QC	Quality Assurance/Quality Control
QDS	Quarter Degree Squares
RLS	Rustenburg Layered Suite
SABAP2	South African Bird Atlas Project 2
SABCA	South African Butterfly Conservation Assessment
SACAD	South African Conservation Areas Database
SACNASP`	South African Council for Natural Applied Science Professionals
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity institute
SAPAD	South African Protected Areas Database
SARCA	South African Reptile Conservation Assessment
SCC	Species of conservation concern
SDF	Spatial Development Framework
TDS	Total dissolved solids
ToPS	Threatened and Protected Species List (2007) as part of the NEMBA
VU	Vegetation Unit
WISA	Water Institute of South Africa
WMA	Water Management Area
XRF	X-ray fluorescence



**PART A**  
**SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT**

**1 CONTACT PERSON AND CORRESPONDENCE ADDRESS**

**1.1 DETAILS OF:**

**1.1.1 The EAP who prepared the report**

Name of the Practitioner: Prescali Environmental Consultants.  
The report was compiled by Dr Petro ERASMUS (*EAPASA*)(*Pri.Sci.Nat*).  
Tel No.: 012 543 3808  
Fax No. :086 621 0294  
e-mail address: [info@prescali.co.za](mailto:info@prescali.co.za)

**1.2 EXPERTISE OF THE EAP**

**1.2.1 The qualifications of the EAP**

*(With evidence attached as Appendix 1)*

Dr. P. Erasmus has qualifications in Zoology and Biochemistry and further studied in Zoology and Marine pollution. She is registered as a Pri Sci Nat. (SACNASP), Natural Professional Scientist, for Ecological and Environmental Sciences. She is also a registered Environmental Assessment Practitioner with EAPASA. Her qualifications are provided in Appendix 1.

Reviewers:

- Ms Simrin Reddy has qualifications in Environmental Sciences. Her qualifications are provided in Appendix 1.
- Ms. E. van der Linde has qualifications in Geology, Engineering Geology and Environmental Management and experience in Water and Environmental Management. She is registered as a Pri Sci Nat. (SACNASP), Natural Professional Scientist and at EAPASA. Her qualifications are provided in Appendix 1.

**1.2.2 Summary of the EAP's past experience.**

*(Attach the EAP's curriculum vitae as Appendix 2)*

Dr. P. Erasmus has 15 years of applicable experience (a short resume with a list of projects is attached in Appendix 2 and has been employed by:

- Department: Water Affairs and Forestry (DWAF);
- M2 Environmental Connections (Pty) Ltd; and
- Prescali Environmental Consultants (Pty) Ltd.

Reviewers:

- Miss S. Reddy has 1 year 5 months applicable experience (a short resume with a list of projects is attached in Appendix 2) and has been employed by:
  - Prescali Environmental Consultants (Pty) Ltd.
- Ms. E. van der Linde has 22 years of applicable experience (a short resume with a list of projects is attached in Appendix 2 and has been employed by:
  - Department: Water Affairs and Forestry (DWAF);
  - Groundwater Consulting Services cc;
  - M2 Environmental Connections cc; and
  - Prescali Environmental Consultants (Pty) Ltd.

## 2 LOCATION OF THE OVERALL ACTIVITY

The proposed prospecting activities will take place on the following farms and portions as outlined below. Please refer to Figure 3-1.

1.	Farm Name:	Aurora	
	Farm Number:	397	
	Registration Division:	LR	
	Portions:	0	
	Administrative District:	Blouberg Local Municipality	
	SG Codes	Farm Portion	SG Code
	0	TOLR00000000039700000	

2.	Farm Name:	Nonnenwerth	
	Farm Number:	421	
	Registration Division:	LR	
	Portions:	0	
	Administrative District:	Blouberg Local Municipality	
	SG Codes	Farm Portion	SG Code
	0	TOLR00000000042100000	
	1	TOLR00000000042100001	
	2	TOLR00000000042100002	

3.	Farm Name:	Non Plus Ultra	
	Farm Number:	683	
	Registration Division:	LR	
	Portions:	0	
	Administrative District:	Mogalakwena Local Municipality	
	SG Codes	Farm Portion	SG Code
	0	TOLR00000000068300000	

4.	Farm Name:	Altona	
	Farm Number:	696	
	Registration Division:	LR	
	Portions:	0	
	Administrative District:	Mogalakwena Local Municipality	
	SG Codes	Farm Portion	SG Code
	0	TOLR00000000069600000	

5..	Farm Name:	Teneriffe	
	Farm Number:	682	
	Registration Division:	LR	
	Portions:	0	
	Administrative District:	Mogalakwena Local Municipality	
	SG Codes	Farm Portion	SG Code
	0	TOLR00000000068200000	

6.	Farm Name:	Gilleberg	
	Farm Number:	861	
	Registration Division:	LR	
	Portions:	1	
	Administrative District:	Mogalakwena Local Municipality	
	SG Codes	Farm Portion	SG Code
	1	TOLR00000000086100001	

<b>Application Area (Ha):</b>	10 059.35 Ha
<b>Distance and Direction from Nearest Town:</b>	70 km North of Mokopane and 60 km North West of Polokwane
<b>Magisterial District:</b>	Capricorn and Waterberg Districts





<b>Locality Map:</b>	Attach a locality map at a scale not smaller than 1:250000. (See Locality map append as Appendix 3)
----------------------	---

### **3 LOCALITY MAP**

*(Show nearest town, scale not smaller than 1:250000).*

The locality map is provided in Appendix 3 and in Figure 3-1, Figure 3-2 and Figure 3-3.

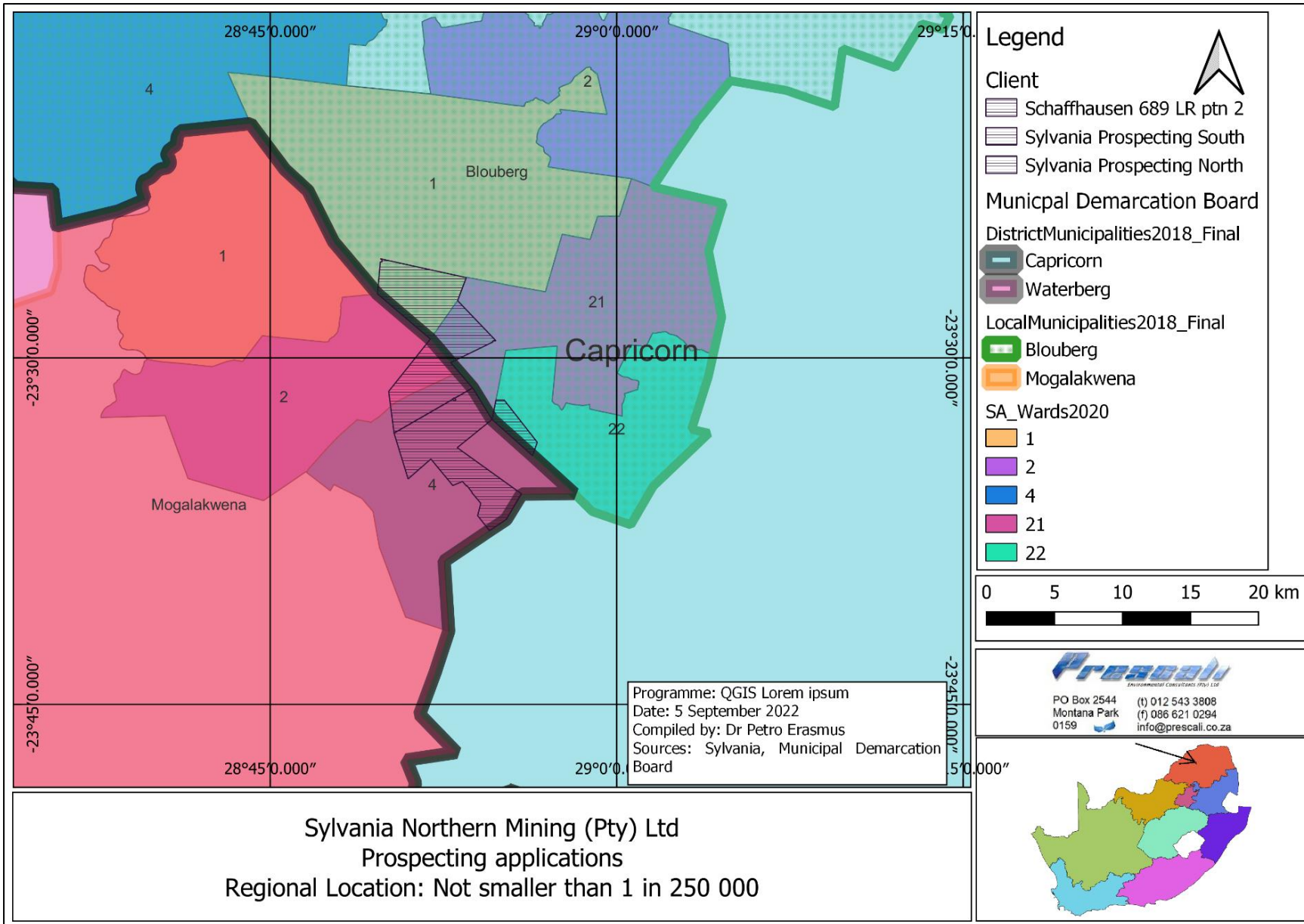


Figure 3-1: Regional Location of the Prospecting Right Area (Not less than 250 000)

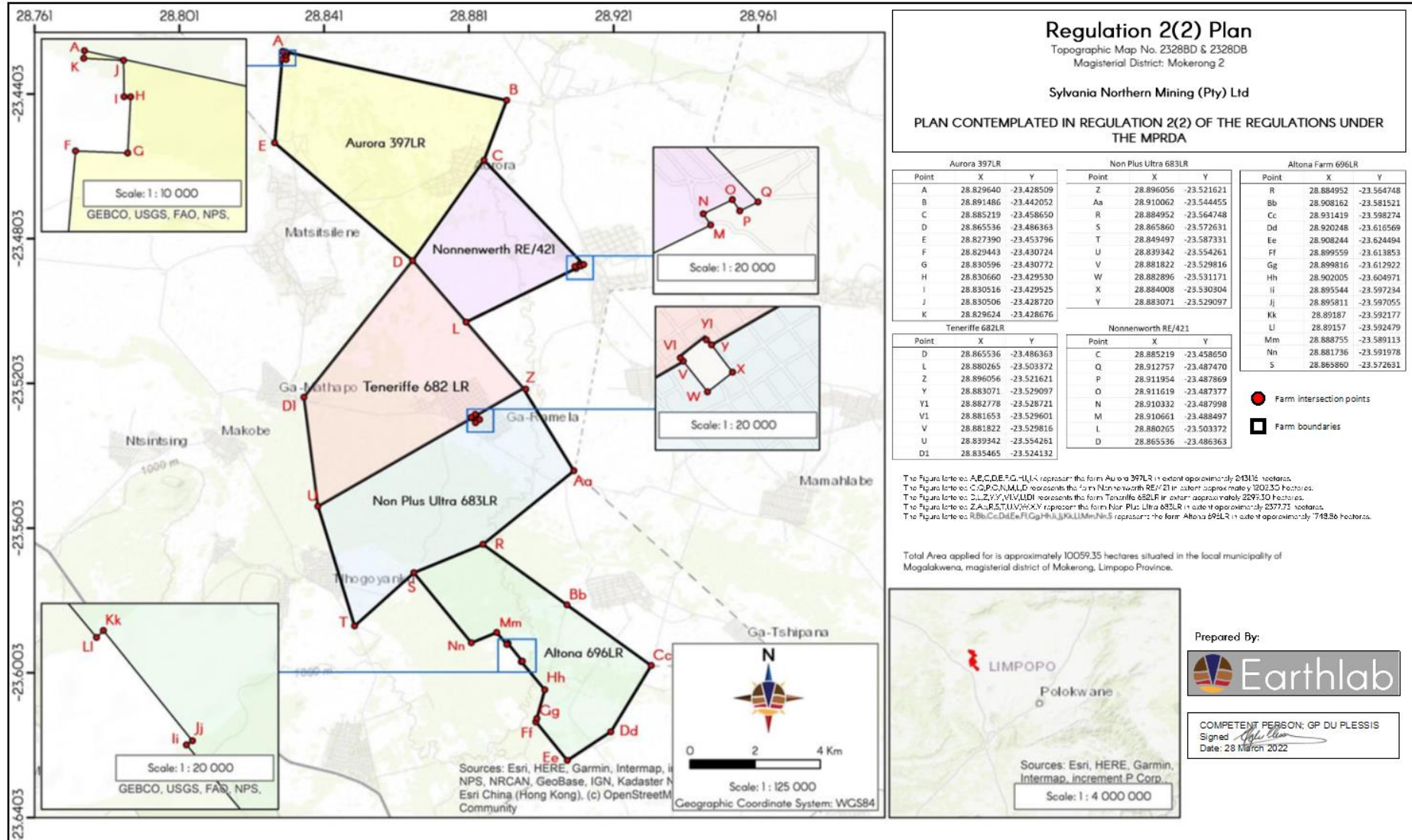


Figure 3-2: Regulation 2(2) map

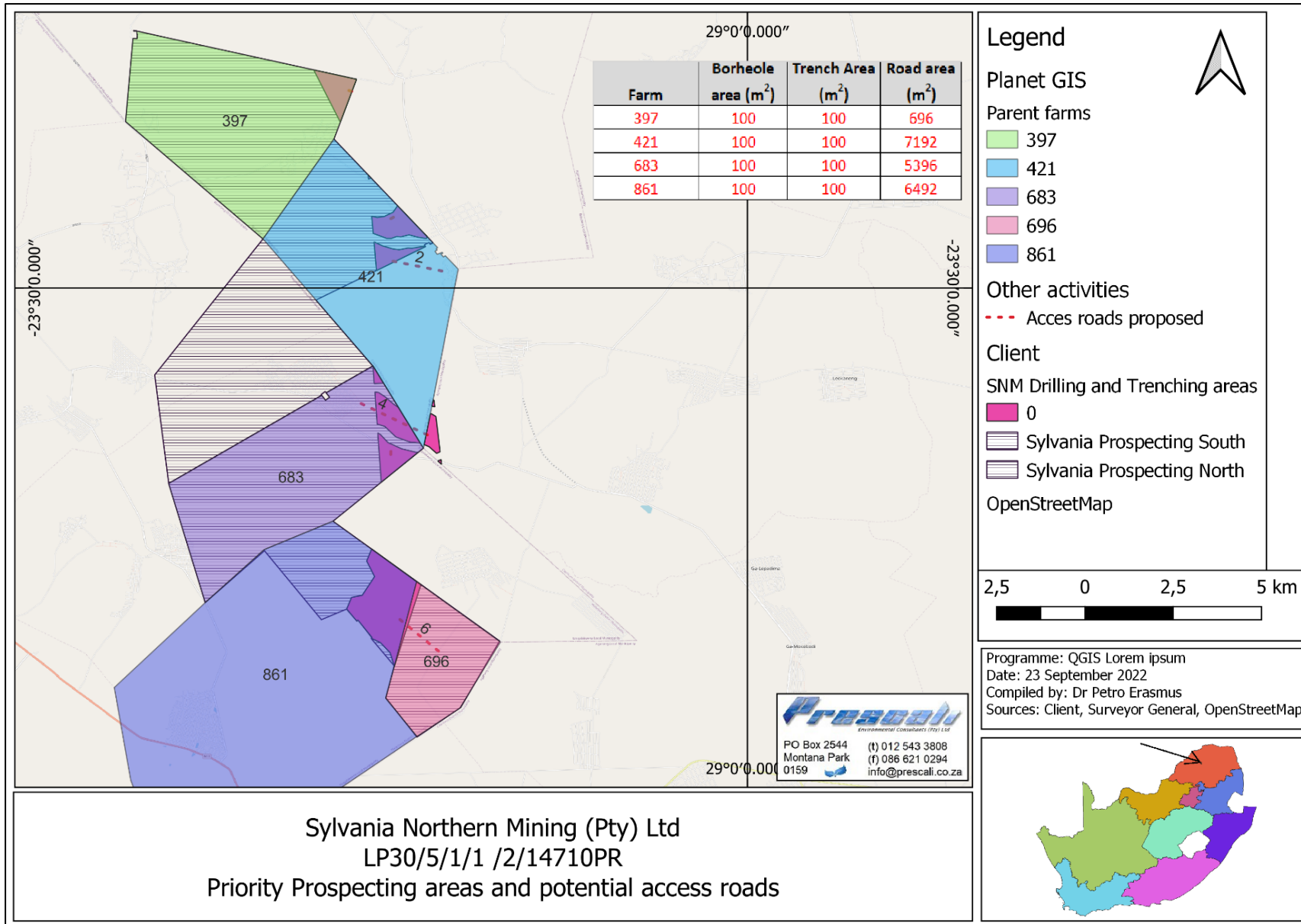


Figure 3-3: Location and area extend of main and listed activities



#### 4 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

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

The following sections outline the proposed prospecting activities and the phases and timelines in which they will occur.

##### 4.1 NON-INVASIVE ACTIVITIES:

###### 4.1.1 Phase 1

- **1.1 – 1.3 Investigate academic data and liaise with communities:** [Year 1; Duration: 6 Months]: Historical mining data and academic literature references will be acquired and reviewed. The data includes historical borehole information and any available geological maps. Additional relevant information will also be acquired. This newly acquired information will be scrutinised, inventoried and verified (QA/QC procedure). Relevant academic studies about the area will also be examined for details on controls of mineralisation. Remote sensing data including satellite imagery, regional airborne geophysical data will also be acquired.
- **1.4 Desktop study: [Year 1; Duration: 1 month]:** A desktop study will be undertaken with a focus on the controls of mineralisation in the project area. The study aims to better understand the mineralisation features to define detailed exploration target areas more accurately.
- **1.5 Inventories, capture and QA/QC and database creation: [Year 1; Duration: 5 months]:** The above data will be compiled into a geological database in GIS digital map format to perform target generation exercises as well as geological modelling during later stages of the project.
- **1.6 Preliminary site visit: [Year 1; Duration: 1 week]:** A field visit will be undertaken to familiarise the applicant with surface features (such as cultural features, infrastructure, water bodies and wetlands) in the project area and to meet the surface landowners. During this visit farm boundaries within the project area and farming activities will be verified. An effort will be made to identify any factors that may impact the exploration program. The information collected during the site visit will be used to derive and prioritise preliminary exploration targets.
- **1.7 – 1.8 Regional geochemistry and geophysical interpretation:** [Year 1; Duration: 4 months]: Existing regional soil geochemical data and geophysical data will be interpreted to derive exploration targets in the prospecting area.
- **1.9 Integrate information and define exploration targets:** [Year 1; Duration: 1 month]: Information collected will be analysed and interpreted. Preliminary exploration targets will be delineated and ranked according to appropriate prospect activity parameters including geological stratigraphy and structures, historic exploration results, etc. This will permit an exploration strategy to be devised for the project area.

###### 4.1.2 Phase 2

- **2.1 – 2.2 Ground geophysics and soil geochemical sampling:** [Year 2; Duration: 10 months]: Please refer to the invasive exploration section.
- **2.3 Trenching:** [Year 2; Duration: 5 months]: Please refer to the invasive exploration section.

###### 4.1.3 Phase 3

- **3.1 Drilling:** [Year 3; Duration: 8 months]: Please refer to the invasive exploration section.
- **3.2 Logging, sampling and analysis:** [Year 3; Duration: 12 Months]: Logging of the lithology, mineralization, structure and alteration will be undertaken on all the drill holes, followed by a sampling of the mineralized sections of the drill holes. Included in the number of samples produced per drill hole will be the QA/QC samples (approximately about 30%). Samples will be sent to a commercial laboratory for elemental analysis.
- **3.3 Geological modelling:** [Year 3; Duration: 6 Months]: Utilising all the detailed geological and grade information, a geological model for the deposit will be generated.



#### 4.1.4 Phase 4

- **4.1 Resource drilling:** [Year 4; Duration: 4 Months]: Please refer to the invasive exploration section.
- **4.2 Estimation of resource:** [Year 4; Duration: 3 Months]: Utilising all the detailed geological and grade information, an estimation of the resource will be undertaken for the deposit.
- **4.3 Pre-feasibility study:** [Year 4; Duration: 12 Months]: A pre-feasibility study investigates whether a concept satisfies the objectives and the technical, economic, social and environmental constraints for a particular project. Preparation for the pre-feasibility study will include: -
  - Initial conceptual mine planning
  - Planning the infrastructure requirements
  - Environmental management planning
  - Financial modelling
  - Market analysis
  - Analysis of transport logistics to market
  - Assessment of personnel and training requirements
  - Assessment of socio-economic factors
  - Permitting requirements

#### 4.1.5 Phase 5

- **5.1 Feasibility study:** [Year 5; Duration: 6 Months]: A feasibility study is multidisciplinary by nature requiring the highest levels of expertise available. Such studies are both costly and time-consuming.

## 4.2 INVASIVE ACTIVITIES

It is of significance to note that the specific exploration methods to be employed will depend on the results generated from previous phases and this programme assumes that the results are positive in each stage. It should also be noted that the first step in any exploration programme is to attempt to acquire and compile any existing exploration data in the area. Should this be successful, certain items in the programme could be reduced or could even become redundant and the pace of the entire programme could be accelerated.

- **2.1 – 2.2 Ground geophysics and soil geochemical sampling:** [Year 2; Duration: 10 months]: Geochemical sampling campaigns with pre-designed sampling grids of 250 m x 250 m will be undertaken on the prospecting areas. The collected samples will be analysed for major elements with the use of a portable XRF to enable the creation of geochemical anomaly maps. Ground magnetic surveys will be carried out to delineate structural features which may control mineralisation in the prospect area.
  - The sample points will be 250 m apart from each other. Two soil samples will be taken at each sample point from the same source. The soil sample will usually entail the removal of the top 20-30 cm of soil using a hand shovel, and 2 samples of 3-5 kg each will be bagged. A GPS point will be taken. The hole from where the sample is taken does not exceed 1m in depth, and will be a maximum of 1 m<sup>2</sup>. The hole will be filled once the sample is taken with the material that was initially removed. The location test holes will usually be shifted slightly as not to affect the vegetation in the immediate vicinity. The work is carried out on foot, with a hand shovel and does not entail the use of any machinery on the sample area. The soil test area will be photographed before, during, and after the sample collection is complete.
  - The 250 m grid will not be established over the entire area, but will be selected based on the findings from the year 1 desktop study.
- **Trenching:** [Year 2; Duration: 5 months]: Eight short (25 m x 2 m x 2 m) trenches will be excavated over the outcrop positions of the defined orebodies. The trenches will be geologically mapped and the sidewalls of the trenches will be sampled. Once this is complete, the trenches



will be refilled. During the trenching and mapping, temporary barriers will be erected around the excavation to prevent people/animals from falling into the trenches.

- **3.1 and 4.1 Resource drilling:** [Year 3; Duration: 8 months]; Drilling (diamond or RC) of the prospective areas will commence establishing the presence of mineralisation in the prospect areas. Geological borehole logging, downhole geophysical logging, core magnetic susceptibility measurement and sampling will also be carried out. It is anticipated that initially approximately 4 drill holes will be drilled. Drill holes could vary in depth from 150 to 350 m, with an average depth of 250 meters. The total amount of drilling to be budgeted for at this stage is 750 meters depth. Depending on the results of this drilling further 1 drill hole totalling 250 meters depth may be required.

Sample analysis of all the potential intersections will be carried out by a certified commercial laboratory. For budgeting purposes, it is estimated that about 50% of the drilled meters will be sampled.

The geological information generated will be used to model and estimate the resource. The resources will at least be expected to be in the Indicated Category according to the JORC code.

#### **4.3 DESCRIPTION OF PRE-/FEASIBILITY STUDIES**

It is envisaged that a Pre-Feasibility Study (PFS) will commence following Phase 3 exploration. A PFS will be done to investigate various options and to be able to choose the most appropriate option to conduct a full Feasibility Study on. The study will comprise of, inter alia, the following:

- Geological modelling and geological resource statement.
- Mine planning and preliminary design.
- Study of surface infrastructural requirements and general engineering.
- Metallurgical studies and preliminary plant design.
- Studies relating to water availability and usage.
- Studies relating to electricity requirements and availability.
- Environmental Impact Studies.

The results of the studies will form the basis of a financial model to test the viability of the various options and the proposed project.

All studies will be conducted by independent professionals.

### **5 LISTED AND SPECIFIED ACTIVITIES**

No Environmental Impacts are foreseen on the farm Teneriffe 682 LR as NO invasive activities will take place on them only non-invasive assessments.

Invasive prospecting activities (geochemical and soil sampling, drilling and trenching) will take place on the following farms: Gillemberg 861 LR, Non Plus Ultra 683 LR, Aurora 397 LR and Nonnenwerth 421 LR, as access roads will also be needed.

Access roads will also be located on the farm Altona 696 LR.

The listed activities for which an environmental authorisation is needed is provided in Table 5-1.

**Table 5-1: Listed Activities**

<b>NAME OF ACTIVITY</b> <i>(E.g. For prospecting–drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route)</i>	<b>AERIAL EXTENT OF THE ACTIVITY</b> Ha or m <sup>2</sup>	<b>LISTED ACTIVITY</b> <i>(Mark with an X where applicable or affected).</i>	<b>APPLICABLE LISTING NOTICE</b>	<b>WASTE MANAGEMENT AUTHORIZATION</b> <i>(Indicate whether an authorization is required in terms of the Waste Management Act). (Mark with an X)</i>
Drill Site	10 m x 10 m Drill Sites 1 Drill site= 100 m <sup>2</sup> Total Drill Site Areas (6) = 600 m <sup>2</sup>	X	GNR 983 (as amended 07 April 2017) Listed Activity 20	
Trenching	25 m x 2 m Trench Sites 1 Trench = 50 m <sup>2</sup> Total Trench Areas (25) = 1200 m <sup>2</sup>	X	GNR 983 (as amended 07 April 2017) Listed Activity 20	
Rehabilitation and Closure	1800 m <sup>2</sup>	X	GNR 983 (as amended 07 April 2017) Listed Activity 31	





**6 POLICY AND LEGISLATIVE CONTEXT**

**Table 6-1: Applicable Legislation and Guidelines taken into consideration**

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p><i>(a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);</i></p>		<p><i>(E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)</i></p>
<p><b>The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</b> Section 2 of the Constitution states that: “This Constitution is the supreme law of the Republic; law or conduct inconsistent with it is invalid, and the obligations imposed by it must be fulfilled.” Section 24 of the CA, states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</p> <ul style="list-style-type: none"> <li>• prevent pollution and ecological degradation;</li> <li>• promote conservation; and</li> <li>• secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</li> </ul> <p>Section 24 guarantees the protection of the environment through reasonable legislative (and other measures) and such legislation is continuously in the process of being promulgated. Section 33(1) concerns administrative justice which includes the constitutional right to administrative action that is lawful, reasonable and procedurally fair.</p>	<p>The BAR and EMPr was accordingly prepared and considered within the constitutional framework set by Section 24 and 33 of the Constitution.</p>	<p>The prospecting application has been submitted in terms of the National Environmental Management Act</p>
<p><b>The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Assessment Regulations, 2014 (as amended)</b> The overarching principle of the NEMA is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations.</p> <p>Section 2 of NEMA provides for National Environmental Management Principles. These principles include:</p> <ul style="list-style-type: none"> <li>• Environmental management must place people and their needs at the forefront of its concern.</li> <li>• Development must be socially, environmentally and economically sustainable.</li> <li>• Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.</li> </ul>	<p>The BAR and EMPr was distributed for public review for periods stipulated in NEMA as part of the environmental impact assessment process. The document was also compiled to ensure compliance with the requirements as per the EIA regulations.</p> <p>Refer to Table 5-1 of the BAR for the listed activities</p>	<p>According to the EIA Regulations (GNR 982, 2014) as amended the following will be submitted in support of the application for Environmental Authorisation: BAR / EMP (this document) together with the results of consultation with Interested and Affected Parties (IAPs) and State Departments.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<ul style="list-style-type: none"> <li>• Environmental justice must be pursued.</li> <li>• Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued.</li> <li>• Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.</li> <li>• The participation of all Interested and Affected Parties (I&amp;APs) in environmental governance must be promoted.</li> <li>• Decisions must consider the interests, needs and values of all I&amp;APs. The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.</li> <li>• Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.</li> <li>• The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.</li> <li>• The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.</li> </ul> <p>The EIA process to be undertaken in respect of the authorization process of the proposed mining operations complies with the MPRDA, as well as the NEMA read with the Environmental Impact Assessment Regulations of 2014 (as amended). The proposed development involves 'listed activities', as identified in terms of the NEMA and in terms of section 24(1), the potential consequences for or impacts on the environment of listed activities must be considered, investigated, assessed and reported on to the Minister of Mineral Resources or to the relevant office of the Department responsible for mineral resources, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of the NEMA.</p>	<p>applicable to the proposed project.</p>	
<p><b>GNR 1147 (20 November 2015) of the NEMA - Financial Provisioning Regulations</b> In accordance with the above legislation, the holder of a mining right must make the prescribed financial provision for the costs associated with the undertaking of the management, rehabilitation and remediation of the negative environmental impacts due to prospecting,</p>	<p>The Final Rehabilitation, Decommissioning and Mine Closure plan will be compiled</p>	<p>Section 21 of Part A of this report details the calculated financial liability that Sylvania Northern Mining</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p>exploration and mining activities and the latent or residual environmental impacts that may become known in future.</p>	<p>in accordance with GNR 1147.</p>	<p>(Pty) Ltd must provide for the rehabilitation of the area that is going to be disturbed.</p>
<p><b>Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)</b> Previously South African mineral rights were owned either by the State or the private sector. This dual ownership system represented an entry barrier to potential new investors. The current Government's objective is for all mineral rights to be vested in the State, with due regard to constitutional ownership rights and security of tenure. The MPRDA was passed in order to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources, and to provide for matters connected therewith. The Preamble to the MPRDA inter alia affirms the State's obligation to:</p> <ul style="list-style-type: none"> <li>• protect the environment for the benefit of present and future generations;</li> <li>• ensure ecologically sustainable development of mineral and petroleum resources; and</li> <li>• promote economic and social development.</li> </ul> <p>The aforesaid preamble affirms the general right to an environment provided for in section 24 of the Constitution (as set out hereinabove).</p> <p>The objects of the MPRDA, as set out in section 2 thereof serve as a guide to the interpretation of the Act.</p> <p>The objects of the MPRDA are as follows:</p> <ul style="list-style-type: none"> <li>• recognise the internationally accepted right of the State to exercise sovereignty over all the mineral and petroleum resources within the Republic;</li> <li>• give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources;</li> <li>• promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa;</li> <li>• substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation's mineral and petroleum resources;</li> <li>• promote economic growth and mineral and petroleum resources development in the Republic;</li> </ul>	<p>An integrated application in terms of the MPRDA and NEMA is being undertaken. The NEMA process for the proposed project is described below.</p>	<p>An application for a Prospecting Right was submitted to the DMR for which an acceptance letter to continue to apply was issued. Should the BAR and EMPr be approved a Prospecting right will be issued.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<ul style="list-style-type: none"> <li>• promote employment and advance the social and economic welfare of all South Africans;</li> <li>• provide for security of tenure in respect of prospecting, exploration, mining and production operations;</li> <li>• give effect to section 24 of the Constitution by ensuring that the nation’s mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and</li> <li>• ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.</li> </ul> <p>The national environmental management principles provided for in section 2 of the NEMA apply to all prospecting and mining operations and any matter relating to such operation. These principles apply throughout the Republic to the actions of all organs of state including inter alia the Department of Mineral Resources that may significantly affect the environment.</p> <p>Any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations.</p> <p>Section 38 of the MPRDA states that the holder of inter alia, a prospecting right, mining right or mining permit:</p> <ul style="list-style-type: none"> <li>• Must at all times give effect to the general objectives of integrated environmental management laid down in Chapter 5 of NEMA;</li> <li>• Must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment as contemplated in section 24(7) of NEMA;</li> <li>• Must manage all environmental impacts – <ul style="list-style-type: none"> <li>○ In accordance with an environmental management plan or approved environmental management programme, where appropriate, and</li> <li>○ As an integral part of the prospecting or mining operations, unless the Minister directs otherwise.</li> </ul> </li> <li>• Must as far as reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and</li> </ul>		



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<ul style="list-style-type: none"> <li>Is responsible for any environmental damage, pollution or ecological degradation as a result of prospecting or mining operations and which may occur inside and outside the boundaries of the area to which such right, permit or permission relates.</li> </ul>		
<p><b>National Water Act, 1998 (Act No. 36 of 1998 (NWA))</b> In terms of the NWA, the National Government, acting through the Minister of Water Affairs, is the public trustee of South Africa’s water resources, and must ensure that water is protected, used, development, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons (section 3(1)).</p> <p>In terms of the NWA a person may only use water without a license under certain circumstances. All other use, provided that such use qualifies as a use listed in section 21 of the Act, require a water use license. A person may only use water without a license if such water use is permissible under Schedule 1 (generally domestic type use) if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA.</p> <p>Section 21 of the NWA indicates that “water use” includes:</p> <ul style="list-style-type: none"> <li>taking water from a water resource (section 21(a));</li> <li>storing water (section 21(b));</li> <li>impeding or diverting the flow of water in a water course (section 21(c));</li> <li>engaging in a stream flow reduction activity contemplated in section 36 (section 21(d));</li> <li>engaging in a controlled activity which has either been declared as such or is identified in section 37(1) (section 21(e));</li> <li>discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit (section 21(f));</li> <li>disposing of waste in a manner which may detrimentally impact on a water resource (section 21(g));</li> <li>disposing in any manner of water which contains waste from, or which has heated in, any industrial or power generation process (section 21 (h));</li> <li>altering the bed, banks, course or characteristics of a water course (section 21(i));</li> </ul>	<p>Refer to Section 10.6 where the baseline water resource of the project area is characterised.</p>	<p>No activities will take place within the regulated area in terms of the NWA therefore no authorisation is required.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<ul style="list-style-type: none"> <li>removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people (section 21(j)); and</li> <li>using water for recreational purposes (section 21(k)).</li> </ul> <p>In addition to the above and in terms of section 26 of the NWA, Regulations on the Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources were published in GN R. 704 of 4 June 1999 (GN R. 704). The aforesaid GN R. 704 provides for inter alia the capacity requirements of clean and dirty water systems (Regulation 6), the protection of water resources by a person in control of a mine (Regulation 7), security and addition measures (Regulation 8) and temporary or permanent cessation of a mine or activity (Regulation 9).</p> <p>According to GN R. 704 “no person in charge of a mine may carry on any underground or opencast mining, prospecting or any other operation or activity under or within the 1:50 year flood-line or within a horizontal distance of 100 metres from any watercourse or estuary, whichever is the greatest”. Insofar as the undertaking of section 21 water uses is concerned, it is anticipated that application for registration and water use licensing will be undertaken.</p>		
<p><b>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</b></p> <p>The NHRA established the South African Heritage Resources Agency (SAHRA) as well as Provincial Heritage Resources Agencies. In terms of the NHRA, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.</p> <p>No person may damage, disfigure, alter, subdivide or in any other way develop any part of a protected area unless, at least 60 days prior to the initiation of such changes, he/she/it has consulted with the relevant heritage resources authority. Section 34 of the NHRA provides for the protection of immovable property by providing for a prohibition on altering or demolishing any structure or part of any structure, which is older than 60 years, without a permit issued by the relevant provincial heritage resources authority. Accordingly, should the proposed activities, prospecting or mining activities or the closure and rehabilitation of mined land involve the altering or demolishing of any structure or part of any structure, which is older than 60 years, a permit issued by the relevant provincial heritage resources authority is required.</p>	<p>Refer to Section 10.9.</p>	<p>Known Heritage sites were classified in terms of sensitivity and buffer zones were identified. None will be impacted by the proposed prospecting.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p>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 any meteorite; destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite; trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.</p> <p>No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves; destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or bring onto or use at the burial ground or grave referred to above any excavation equipment or any equipment which assists in the detection or recovery of metals.</p> <p>Section 38 of the NHRA states that any person who intends to undertake developments categorised in Section 38 of the NHRA must at the very earliest stages of initiating such development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. By way of example, the developments referred to in Section 38 of the NHRA include:</p> <ul style="list-style-type: none"> <li>• the Site Establishment of a road, wall, power-line, pipeline, canal or other similar form of linear development or barrier exceeding 300 metres in length;</li> <li>• the Site Establishment of a bridge or similar structure exceeding 50 metres in length;</li> <li>• any development or other activity which will change the character of a site as specified in the regulations;</li> <li>• any other category of development provided for in regulations by SAHRA or the provincial heritage resources authority.</li> </ul> <p>However, the abovementioned provisions are subject to the exclusion that section 38 does not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation</p>		



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p>Act No. 73 of 1989 (EIA) (now presumably the NEMA in view of the repeal of the listed activities under the ECA: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.</p>		
<p><b>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA)</b>            The NEMBA aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.</p> <p>The NEMBA provides for the publishing of various lists of species and ecosystems by the Minister of Environmental Affairs and Tourism (now the Minister of Water and Environmental Affairs) as well as by a Member of the Executive Council responsible for the conservation of biodiversity of a province in relation to which certain activities may not be undertaken without a permit. In terms of Section 57 of the NEMBA, no person may carry out any restricted activity involving any species which has been identified by the Minister as "critically endangered species", "endangered species", "vulnerable species" or "protected species" without a permit. The NEMBA defines "restricted activity" in relation to such identified species so as to include, but not limited to, "hunting, catching, capturing, killing, gathering, collecting, plucking, picking parts of, cutting, chopping off, uprooting, damaging, destroying, having in possession, exercising physical control over, moving or translocating".\</p> <p>The Minister has made regulations in terms of section 97 of the NEMBA with regards to Threatened and Protected Species which came into effect on 1 June 2007. Furthermore, the Minister published lists of critically endangered, endangered, vulnerable and protected species in terms of section 56(1) of the NEMBA.</p>	<p>The legislation was considered throughout the EIA process and in particular the Ecological Impact Assessment which will comply with the NEMBA.</p>	<p>Once final layouts for the roads, trenches and drilling areas are available these will be assessed for any protected flora species.</p>





Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p><b>National Forestry Act, 1998 (Act No. 84 of 1998)</b> The purpose of this Act is to promote the sustainable management of forests. Everyone has the constitutional right to have the environment protected for the benefit of present and future generations; Natural forests and woodlands form an important part of that environment and need to be conserved and developed according to the principles of sustainable management; Plantation forests play an important role in the economy; Plantation forests have an impact on the environment and need to be managed appropriately; The State's role in forestry needs to change; and The economic, social and environmental benefits of forests have been distributed unfairly in the past.</p>	<p>There are no natural or plantation forests applicable to the application area.</p>	<p>There are no natural or plantation forests applicable to the application area.</p>
<p><b>National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA)</b> The NEMAQA came into power on the 24<sup>th</sup> of February 2005. Additionally, the amendment to the Minimum Emission Standards (GN R 893) also came into effect on the 12 June 2015. This Notice provides a list of activities that may cause atmospheric emissions which have or may have a significant detrimental effect on the environment as well as the minimum emission standards (“MES”) for these activities as contemplated in section 21 of NEMAQA.  The effect of the commencement of the NEMAQA and the listed activities, listed in GN 964 is that an atmospheric emission licence (AEL) is now required for conducting these listed activities.</p>	<p>There are no listed activities that require registration/permitting for the proposed prospecting activities.</p>	<p>No listed activities in terms of the NEMAQA are triggered by the proposed project. Therefore, no AEL is required.  Activities associated with the proposed project are unlikely to result in exceedances of the air quality standards.</p>
<p><b>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA)</b> The NEMWA commenced on 1 July 2009 and as a result of its commencement the relevant provisions in the Environment Conservation Act No. 73 of 1989 (ECA) in respect of waste management, were repealed. The NEMWA sets out to reform the law regulating waste management and deals with waste management and control more comprehensively than was dealt with in the ECA. It also introduces new and distinct concepts never before canvassed within the realm of waste management in South Africa, such as the concept of contaminated land and extended producer responsibility. It also provides for more elaborate definitions to assist in the interpretation of the Act.  Section 19 of the NEMWA provides for listed waste management activities and states in terms of section 19(1), the Minister may publish a list of waste management activities that have, or</p>	<p>There are no listed activities that require registration/permitting for the proposed prospecting activities.</p>	<p>No Listed activities in terms of NEMWA are triggered by the proposed project. Therefore, no Waste Management Licence (WML) is required.  It is however noted that any minimal waste produced on site should be transferred to the nearest licensed waste disposal facility.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p>are likely to have a detrimental effect on the environment. Such a list was published in GNR 921 of 29 November 2013.</p> <p>In accordance with section 19(3), the Schedule to GNR 921 provides that a waste management licence is required for those activities listed therein prior to the commencement, undertaking or conducting of same. In addition, GNR 921 differentiates between Category A, B, and Category C waste management activities. Category A waste management activities are those which require the conducting of a basic assessment process as stipulated in the EIA Regulations, 2014 promulgated in terms of the NEMA as part of the waste management licence application and Category B waste management activities are those that require the conducting of a scoping and environmental impact assessment process stipulated in the EIA Regulations, 2014 as part of the waste management licence application. Category C waste management activities do not require a waste management licence, however a person who wished to commence, undertake or conduct a waste management activity listed under this category, must comply with the relevant requirements and standards,</p> <p>Section 20 of the NEMWA pertains to the consequences of listing waste management activities and states that no person may commence, undertake or conduct a waste management activity, except in accordance with the requirements or standards for that activity as determined by the Minister or in accordance with a waste management licence issued in respect of that activity, if a licence is required.</p> <p>In terms of the current statutory framework with regards to waste management, a waste management licence is required for those waste management activities identified in the Schedule to GNR 921. Certain of the waste management activities listed in the Schedule are governed by specific thresholds. Where any process or activity falls below or outside the thresholds stipulated, a waste management licence is not required.</p>		
<p><b>Focus Areas for Protected Area Expansion – NPAES (2008)</b> The goal of the National Protected Area Expansion Strategy (NPAES) is to achieve cost effective protected area expansion for ecological sustainability and adaptation to climate change. The NPAES sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. It deals with land-based and marine protected areas across all of South Africa's territory (SANBI, BGIS).</p>	<p>There are no listed activities that require registration/permitting for the proposed prospecting activities.</p>	<p>This was considered during identification of the general areas of prospecting overlain with sensitive areas as identified.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p><b>National Biodiversity Assessment (NBA; 2018)</b> The National Biodiversity Assessment (NBA) is the primary tool for monitoring and reporting on the state of biodiversity in South Africa and is prepared as part of the SANBI mandate under the National Environmental Management: Biodiversity Act (Act 10 of 2004). It is used to inform policies, strategies and actions in a range of sectors for managing and conserving biodiversity more effectively.</p> <p>The NBA focusses primarily on assessing biodiversity at the ecosystem and species level, and the two headline indicators of threat status and protection level are applied to both ecosystems and species in the four realms (terrestrial, inland aquatic, estuarine and marine) and in two cross-realm areas (the coast and South Africa's sub-Antarctic territory). These established headline indicators provide a way of comparing results meaningfully across the realms, and a standardised framework that links with policy and legislation in South Africa to facilitate an effective interface between science and policy. Underlying the headline indicators is a wealth of geographically detailed information that can be applied at the provincial and local level.</p> <p>The latest NBA (NBA 2018) was released in October 2019 and builds on the National Spatial Biodiversity Assessment 2004 and the NBA 2011.</p>	<p>There are no listed activities that require registration/permitting for the proposed prospecting activities.</p>	<p>This was considered during identification of the general areas of prospecting overlain with sensitive areas as identified.</p>
<p><b>Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA)</b> The objectives of this Act are:</p> <ul style="list-style-type: none"> <li>• to manage and protect the environment in the Province;</li> <li>• to secure ecologically sustainable development and responsible use of natural resources in the Province;</li> <li>• generally, to contribute to the progressive realisation of the fundamental rights contained in section 24 of the Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996), and</li> <li>• to give effect to international agreements effecting environmental management which are binding on the Province.</li> </ul> <p>The LEMA deals with the conservation of wild animals, fresh water fish and the conservation and protection of flora in the Limpopo Province. Animals and plants are both listed in the schedules with different degrees of protection afforded to each. The LEMA (2003) contains schedules of specially protected Wild animals (Schedule 2), Protected Wild Animals (Schedule 3), specially protected plants (Schedule 11) and protected plants (Schedule 12).</p>	<p>There are no listed activities that require registration/permitting for the proposed prospecting activities.</p>	<p>This was considered during identification of the general areas of prospecting overlain with sensitive areas as identified.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
<p>This Act must be interpreted and applied in accordance with the national environmental management principles set out in Section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).</p>		
<p><b><i>Integrated Development Plans and Environmental Management Frameworks</i></b></p>		
<p><b>Waterberg District Environmental Management Framework<sup>1</sup> (EMF)</b> The purpose of this EMF is to develop a framework that will integrate policies and frameworks, and align different government mandates in a way that will streamline decision-making to improve cooperative governance and guide future development in an environmentally responsible manner.</p>	<p>The BAR and EMPr outlines how potential impacts will be addressed to ensure that the prospecting activities occur in a responsible manner.</p>	<p>The BAR and EMPr outlines how potential impacts will be addressed to ensure that the prospecting activities occur in a responsible manner.</p>
<p><b>Mogalakwena Municipality Integrated Development Plan (IDP)<sup>2</sup></b> The intention of the IDP is to set in motion a framework that integrates policies and principles aligning various government mandates in a way that will smooth decision making whilst guiding future development in an environmentally friendly way.</p>	<p>The BAR and EMPr highlights how the potential impacts will be dealt with to ensure that prospecting activity takes place within the stipulated environmental principles and guidelines of the district municipality.</p>	<p>The BAR and EMPr outlines how potential impacts will be addressed to ensure that the prospecting activities occur in a responsible manner.</p>
<p><b>Capricorn District Spatial Development Plan and Integrated Development Plan<sup>3</sup></b> The IDP seeks to guide the overall distribution of current and future land use within the municipality to give effect to the goals and objectives as identified. Its plan is to ensure balance between sustainable development and local economic development by managing and enhancing the protection of natural assets accessible in the district. The IDP is an overlay guide of how the proposed project will contribute to the LED and in this case how mining will</p>	<p>The BAR and EMPr is addressing how the environment will be impacted and outline the proposed management measures.</p>	<p>The BAR and EMPr outlines how potential impacts will be addressed to ensure that the prospecting activities occur in a responsible manner.</p>

<sup>1</sup> [https://screening.environment.gov.za/ScreeningDownloads/EMF/WDEMF\\_Final\\_EMF\\_Report.pdf](https://screening.environment.gov.za/ScreeningDownloads/EMF/WDEMF_Final_EMF_Report.pdf) 02/08/2022

<sup>2</sup> [https://www.mogalakwena.gov.za/mogalakwena-admin/pages/sites/mogalakwena/documents/idp/2021\\_22\\_Draft\\_IDP.pdf](https://www.mogalakwena.gov.za/mogalakwena-admin/pages/sites/mogalakwena/documents/idp/2021_22_Draft_IDP.pdf) 07/10/2022

<sup>3</sup> <https://www.cdm.org.za/development-planning-and-environmental-management-services-dpems/> and <https://www.cdm.org.za/wp-content/uploads/2021/06/Final-202122-to-202526-IDPBudget.pdf> 07/10/2022



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
be a potential economic contributor whilst ensuring environmental management legislature is followed.		
<p><b>Blouberg IDP<sup>4</sup></b> One of the objectives identified in the IDP is to achieve “<i>optimum organization and use of land resources in order to meet the social environment and economic needs of the present and future generations</i>” and the IDP proposes to achieve this by the implementation of the Spatial Development plan that includes Spatial transformation that are inclusive of sustainable developments. The IDP mentions specifically the Sylvania Platinum and Ironveld mining companies that have the potential to grow the economy of the municipality and to create the much-needed jobs to the locals.</p>	The BAR and EMPr is addressing how the environment will be impacted and outline the proposed management measures.	Though not many employment opportunities will be created by prospecting activities, the potential or future employment should the resource be viable for full scale mining is in line with the IDP objective to grow the economy in a sustainable manner.

<sup>4</sup> [https://www.blouberg.gov.za/sstaff/pages/sites/blouberg/documents/idp/FINAL%20REVIEWED%20IDP%202022-23%20BLM\\_111232.pdf](https://www.blouberg.gov.za/sstaff/pages/sites/blouberg/documents/idp/FINAL%20REVIEWED%20IDP%202022-23%20BLM_111232.pdf) 7 October 2022

## 7 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

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

The “need and desirability” of a project “is the consideration of the strategic context of a development proposal within the broader societal needs and the public interest”<sup>5</sup> and should be determined by considering the broader community’s needs and interests as reflected in a credible Integrated Development Plan (IDP), Spatial Development Framework (SDF) and Environmental Management Framework (EMF) for the area where the project will be taking place (DEA, 2017).

The minerals included in the prospecting rights application are: Platinum Group Minerals and Gold; Nickel and Copper; Cobalt and Chrome. Purely on the minerals itself the exploitation of these are desirable due to the uses of these minerals and the potential employment opportunities that could be generated should future mining be identified as a viable option.

<b>Metal</b>	<b>Potential uses</b>
Chrome (Cr)	Chromium is used in the Electroplating industry, and in paints and dyes <sup>6</sup> .
Cobalt (Co)	Cobalt is a component of various alloys that are used in the manufacture of aircraft engines, gas turbines, high speed steels. It is also used in magnets and magnetic recording devices, a catalyst in the petroleum and chemical industries and as a drying agent in paints and ink. The radioactive isotope Co-60 is used in medical treatment and to irradiate food for preservation and consumer protection <sup>7</sup> .
Copper (Cu)	Used in the creation of various alloys such as bronze. Other uses are: agricultural poison, algicide in water purification and in a number of goods such as coins, cans, cooking foil, saucepans, electricity cables, planes, and space vehicles <sup>8</sup> .
Gold (Au)	Mainly used to manufacture jewellery, glass it is also used in different parts in electronics items, as reflecting material in windows, embroidery thread and in medicine <sup>9</sup> .
Nickel (Ni)	Nickel has the capacity to resist erosion and thus is used in the production of coins (money), wires, gas turbines, rocket engines, and alloys used for armour plating, nails and pipes. In combination with copper (Monel alloys) it is resistant to sweater corrosion and thus is used in propeller shafts of boats and desalination plants. <sup>10</sup>
Platinum Group Metals (PGM)	Platinum Group Metals <sup>11</sup> are known for their purity, high melting points, catalytic / oxidation and reduction properties and corrosion resistance, PGMs are utilized in various industrial processes, technologies and commercial applications. Consumer and industrial products include flat panel monitors, glass fibre, medical tools, computer hard drives, nylon and razors. Platinum, palladium and rhodium are also used as autocatalysis and pollution control in the automotive sector.

One of the main targets identified in the Mogalakwena IDP<sup>12</sup> is a “Reduction of official unemployment rate from 15.9% in 2014 to 14% by 2020. (Expanded unemployment rate from 30.9% in 2014 to less than 33% by 2020)” on a Provincial level. For the Mogalakwena LM, according to Census 2011, of the 78 647 economically active (employed or unemployed but looking for work) people in the district, 40,2%

<sup>5</sup> [https://cdn.slrconsulting.com/uploads/2020-06/TEPSA\\_11B12B\\_DSR\\_Chap5.pdf](https://cdn.slrconsulting.com/uploads/2020-06/TEPSA_11B12B_DSR_Chap5.pdf) 23 June 2022

<sup>6</sup> <https://byjus.com/chemistry/chromium/#uses-of-chromium> 15 September 2022

<sup>7</sup> <https://byjus.com/chemistry/cobalt/> 4 November 2021

<sup>8</sup> <https://byjus.com/chemistry/copper/> 4 November 2021

<sup>9</sup> <https://byjus.com/chemistry/gold/> 15 September 2022

<sup>10</sup> <https://byjus.com/chemistry/nickel/> 4 November 2021

<sup>11</sup> <https://www.platinumgroupmetals.net/pgm-markets/default.aspx> 4 November 2021

<sup>12</sup> [https://www.cogta.gov.za/cgta\\_2016/wp-content/uploads/2020/12/Mogalakwena-Final\\_IDP\\_2020-21-1.pdf](https://www.cogta.gov.za/cgta_2016/wp-content/uploads/2020/12/Mogalakwena-Final_IDP_2020-21-1.pdf) 9 September 2022



are unemployed. The unemployment rate of Mogalakwena is almost double that of the other municipalities in the district. This could be attributed to a reduction in mining activities in recent years. Of the 39 515 economically active youth (15–35 years) in the area, 51,7% are unemployed, which is also the highest in the district. From Mogalakwena’s IDP the Spatial Development Framework (SDF) and Tourism Strategies has identified mining as one of the vital role-players in promoting growth and development within the municipality. This proves that there is a need and desire for mining to be incorporated in the diversity of the local economy.

From the Blouberg IDP<sup>13</sup> “Employment rate of Blouberg declined by 1% from 9178 to 9130 between 2000 and 2010 before recovering by 6.7% to 13 655 in 2016”.

According to the Capricorn District Municipality<sup>14</sup> “mining is the smallest contributor to the CDM economy, accounts only 0.6%”. This shows the need to incorporate mining in driving economic development and social advancement. The CDM is a municipality comprising of the three mining activities namely the surface, opencast and underground mining with the possibility of opening a broad exploration for developers resulting in a gradual out-turn in social development.

The potential for employment should the prospecting indicate that mining is viable would be good for the Local Municipalities employment rate.

## **8 FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE**

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

The identification of alternatives is a key aspect of the success of the evaluation process. All reasonable and feasible alternatives were identified and screened to determine the most suitable alternative to consider and assess. There are however some significant constraints that have to be considered when identifying alternatives for a project of this scope. Such constraints include financial, environmental and social issues, which will be discussed in the evaluation of the alternatives.

Alternatives can typically be identified according to:

- Location alternatives;
- Process alternatives;
- Technological alternatives; and
- Activity alternatives (including the No-go option).

For any alternative to be considered feasible such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts.

Alternatives can also be distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and or basic assessment phases of the EIA process. Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation measures and are not specifically identified as distinct

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<sup>13</sup> <http://www.blouberg.gov.za/sstaff/pages/sites/blouberg/documents/idp/SUMMARY%20OF%20THE%20IDP.pdf>  
9 September 2022

<sup>14</sup> <http://www.cdm.org.za/mining/#> 07/10/2022



alternatives. This section provides information on the development footprint alternatives, the properties considered, as well as the type of activity, activity layout, technological and operational aspects of the activity.

## **8.1 DETAILS OF THE ALTERNATIVES CONSIDERED**

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

### **8.1.1 Farms on which or location where it is proposed to undertake the activity**

The farms on which the proposed prospecting activities will be located are within various farms in the Blouberg and Mogalakwena districts in the Limpopo Province, see Section 2 and Figure 3-1 as outlined above.

The type of minerals to be prospected for: Chrome Ore, Cobalt, Copper Ore, Gold Ore, Nickel Ore, and Platinum Group Metals.

No alternatives were considered as the DMRE takes into consideration existing mining rights / prospecting rights and the minerals applied for before approving that the application can continue to be processed. It may therefore happen that some farms that are include in the application to the DMRE in terms of the MPRDA may be excluded from the approved application acceptance.

### **8.1.2 Type of activity to be undertaken**

Refer to Section 4 for a full description of proposed activities. Prospecting activities will follow a non-invasive as well as invasive methods. The aim of the proposed activities in a phased approach is to fine tune the following phase activities and the location of those activities, it may thus happen that some phases will not occur depending on the outcome of the previous phase's results. No alternatives were investigated.

### **8.1.3 Design or layout of the activity**

Layout and location of the invasive activities took into consideration the geology of the area and the ore body on which the prospecting will focus. No go areas (e.g. 100 m regulated areas for surface water resources, 500 m for wetlands etc.) were then delineated. Taking into consideration the above and existing roads potential access roads to areas where prospecting will take place was delineated. Therefore, no alternatives were investigated.

### **8.1.4 Technology to be used in the activity**

- Desktop assessments will be used where necessary – no alternatives were considered.
- Ground geophysics and soil geochemical sampling will be done using hand shovels – no alternatives were considered.
- In all instances drilling would be:
  - An independent and experienced drilling contractor will be used to complete the drilling in compliance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996).
  - Under close supervision of an experienced geologist;
  - Conducted along best practice guidelines; and minimize environmental disturbance.
  - At this point in time, it is believed that a diamond drill rig may be used but cannot be confirmed – no alternatives were considered.
- Trenching will be done use heavy machinery e.g. front-end loaders, excavators – no alternatives were considered.

All samples collected will be submitted for analyses to an accredited off-site laboratory to determine the mineral content.



**8.1.5 Operational aspects of the activity.**

A detailed activity plan was made available in the Prospecting Works Programme provided to Prescali and is summarised below:

**Table 8-1: Prospecting Works Programme**

Phase	Activity <i>(What are the activities that are planned to achieve optimal prospecting)</i>	Timeframe <i>(In months for the Activity)</i>	Outcome <i>(What are the expected deliverables, e.g. Geological report, analytical results, feasibility study, etc.)</i>	Timeframe for outcome <i>(Deadline for the expected outcome to be delivered)</i>
<b>Non-invasive Prospecting</b>				
1	1.1 Investigate historical and academic information	6 months	Geological characteristic of the prospect area, geological report	Month 6
	1.2 Liaison with local communities		Permission to prospect	
	1.3 Remote sensing		Prospecting targets	
	1.4 Desktop study of mineralization controls		Understanding of geological controls on mineralisation	
	1.5 Inventorise, capture, QA/QC available data and database creation		Quantification of data	
	1.6 Preliminary site visit for access establishment		Confirmation of general geology and field photographs, field visit report	
	1.7 Regional soil geochemistry		Soil geochemistry anomalies	
	1.8 Regional airborne geophysical interpretation		Prospecting targets/structural interpretation plans	
	1.9 Integrate information and prioritise exploration targets		Characterisation of potential targets, geological report	
<b>Invasive Prospecting</b>				
2	2.1 Ground geophysics	12 months	Geophysical anomalies with drill targets, geophysical report	Month 18
	2.2 Grid soil geochemistry		Geochemical anomalies	
	2.3 Trenching		Drilling targets, sidewall properties, profiles and average grades	
3	Invasive Prospecting			Month 36
	3.1 Drilling (DD or RC)	18 months	Drilled core or RC chips.	
	3.2 Logging, sampling, and analysis		Borehole log data, analytical data, geological sections	
	3.3 Geological modelling		Resource model	
4	Invasive Prospecting and Non-invasive			Month 54
	4.1 Resource drilling	18 months	Infill borehole log data, analytical data, geological sections	
	4.2 Estimation of resource		Final resource estimate	
	4.3 Pre-feasibility study		Pre-feasibility report (Mine plan, optimization, cash flows) Plan design, metallurgical reports	
5	Non-invasive Prospecting			Month 60
	5.1 Feasibility study	6 months	Feasibility report	

### 8.1.6 Option of not implementing the activity.

From the impact assessment it can be seen that the proposed activities and infrastructures will have a negative impact of a Low to Medium-High rating before mitigation and a Low to Medium impact following mitigation.

Should the prospecting application not be successful the potential extend of a viable resource will not be established and this could impact on future employment opportunities in the area.

## 9 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

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

The objectives of the Public Participation Process (PPP) include:

- Providing Interested and Affected parties (I&APs) with an opportunity to voice their support, concerns and raise questions regarding the project, application or decision;
- Providing an opportunity for I&APs, Environmental Assessment Practitioners (EAPs) and the Competent Authority (CA) to obtain clear, accurate and understandable information about the



environmental, social and economic impacts of the proposed activity or implications of a decision;

- Providing I&APs with the opportunity of suggesting ways of reducing or mitigating negative impacts of an activity and for enhancing positive impacts; and
- Enabling the applicant to incorporate the needs, preferences and values of affected parties into the application.

The PPP must comply with the several important sets of legislation that require public participation as part of an application for authorisation or approval; namely:

- The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002 - MPRDA); and
- The National Environmental Management Act, 1998 (Act No. 107 of 1998 - NEMA).

Adherence to the requirements of the above-mentioned Acts will allow for an Integrated PPP to be conducted, and in so doing, satisfy the requirement for public participation referenced in the Acts.

The PPP was conducted in terms of Chapter 6 of the NEMA and included the following:

- Identification of key Interested and Affected Parties (affected and adjacent landowners) and other stakeholders (organs of state and other parties);
- Placement of site notices on farms, and other accessible public areas;
- Formal notification of the application to key Interested and Affected Parties and other stakeholders via email / fax / post;
- Consultation and correspondence with I&APs and Stakeholders and the addressing of their comments. This appendix will be included in the Final Basic Assessment; and
- Newspaper adverts.

During the process, the following methods are used to develop a stakeholder database which will be utilised to ensure a proper representation of stakeholders interested in or affected by the proposed Project.

- Search works and desktop searches are conducted in and around the project area to verify land ownership and obtain contact details;
- Responses received from newspaper advertisements, public notices and site notices;
- Responses received from distribution of the Background Information Document (BID);
- Identification and consultation with stakeholders including commenting authorities (local and district municipalities);
- Organs of state, other than the competent authority, such as the Department of Agriculture, Forestry and Fisheries (DAFF) having jurisdiction in respect of any aspect of the proposed project and affected authorities; and
- Consultations with affected landowners / Tribal authorities.

The PPP commenced on 7 September 2022. Notifications were undertaken as follows:

- Newspaper advertisement:
  - Capricorn Voice: 7 – 13 September 2022 Page 7;
  - Bosveld: 8 – 14 September 2022 Page 6.
- Site Notices were placed on 14 September 2022 in and around the various farms; and
- Background information document: distributed to identified stakeholders via email, SMS, post on 22 September 2022 and throughout the registration period as needed. The background information document was also hand delivered to Tribal Authorities / Head men.

Sylvania Northern Mining also initiated correspondence with the existing mineral right holders on the applicable properties as instructed by the DMRE.



Consultation meetings will be held with registered I&APs, as well as with the Tribal authority and Government officials as needed.

All pre-identified and registered I&APs will be notified of the availability of the Basic Assessment Report for public view for a period of 30 days (11/11/2022 to 11/12/2022) within which the report can be reviewed and comments forwarded to the environmental consultant. Consultation sheets and a comments and issue register will be included in the final BAR as submitted to the DMRE.

Refer to Appendix 5 for details and photographic evidence pertaining to the public participation process to date.

## **9.1 MEETINGS**

This section will be updated once meetings has been confirmed.



## 9.2 SUMMARY OF ISSUES RAISED BY I&APS.

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

This section will be updated as comments are received.

**Table 9-1: Summary of issues raised by I&APs**

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
<b>AFFECTED PARTIES</b>				
Landowners	X			
Lawful occupier/s of the land	X			
Landowners or lawful occupiers on adjacent properties	X			
Municipal councillor	X			
Municipality	X			
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA etc.)				
Communities	X			
Dept. Land Affairs				
Traditional Leaders				
Dept. Environmental Affairs				
Other Competent Authorities affected				
<b>OTHER AFFECTED PARTIES</b>				

## 10 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES.

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

### 10.1 CLIMATE

#### 10.1.1 Regional Climate

The nearest town to the prospecting area is Baltimore (44 km north west) which has a Subtropical steppe climate (Classification: BSh). The district's yearly temperature is 23.26°C and receives about 57.75 millimetres of precipitation annually<sup>15</sup>.

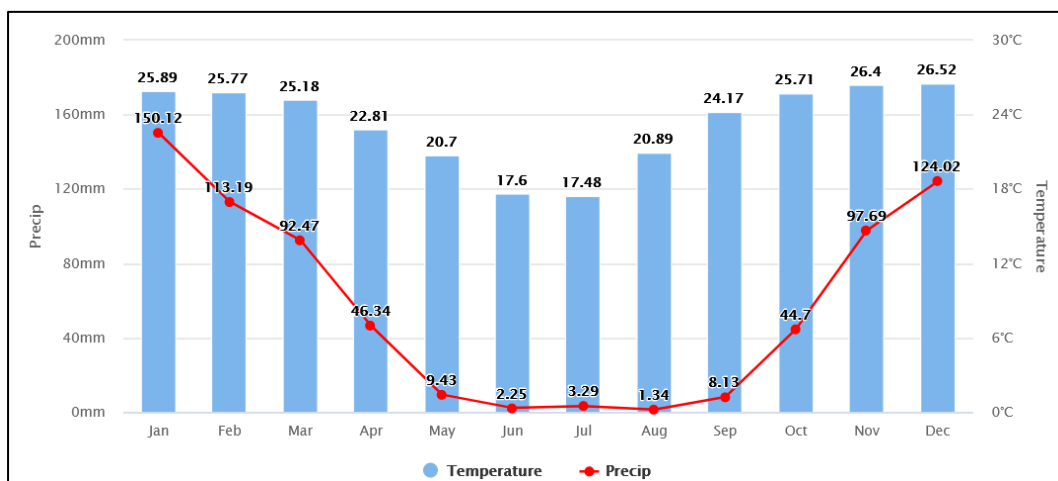


Figure 10-1: Baltimore Monthly Temperatures, Precipitation and Wind speed<sup>15</sup>

##### 10.1.1.1 Precipitation and Evaporation

From the information from tcktcktck.org the average rainfall figures are provided in Table 10-1. Mean Annual Precipitation for the Sylvania Northern Mining (Pty) Ltd is indicated in Figure 10-2 and from WR2012 it ranges from 388 mm to 480 mm across the boundaries as indicated. With regards to evaporation, the Sylvania Northern Mining (Pty) Ltd mine is located within the 2200 – 2600 mm A-pan evaporation zone, Figure 10-3.

Table 10-1: Mean climatic rainfall conditions for the project area <sup>15</sup>

Month	Average precipitation mm	Average precipitation days (≥ 1.0 mm)	Average relative humidity (%)
Jan	150.12	15.24	71.12
Feb	113.19	12.3	71.54
Mar	92.47	11.45	70.36
Apr	46.34	6.71	68.99
May	9.43	2.46	61.29
Jun	2.25	0.19	59.6
Jul	3.29	0.95	59.63
Aug	1.34	0.37	51.65
Sep	8.13	1.8	49.05
Nov	44.7	6.82	52.69
Oct	97.6	11.36	59.41
Dec	124.02	15.33	66.85
Year	57.75	7.08	61.85

<sup>15</sup> <https://tcktcktck.org/south-africa/limpopo/baltimore> 02/08/2022

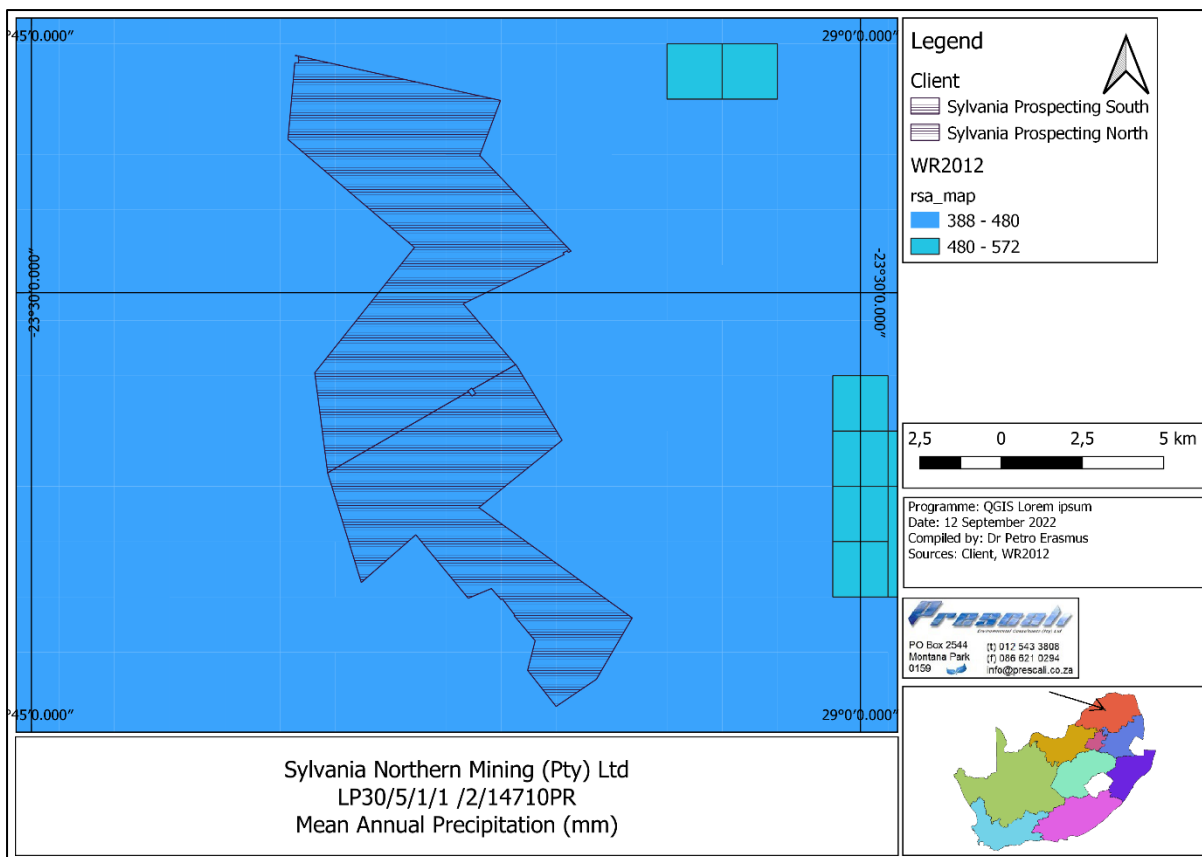


Figure 10-2: Mean annual Precipitation (WR2012)

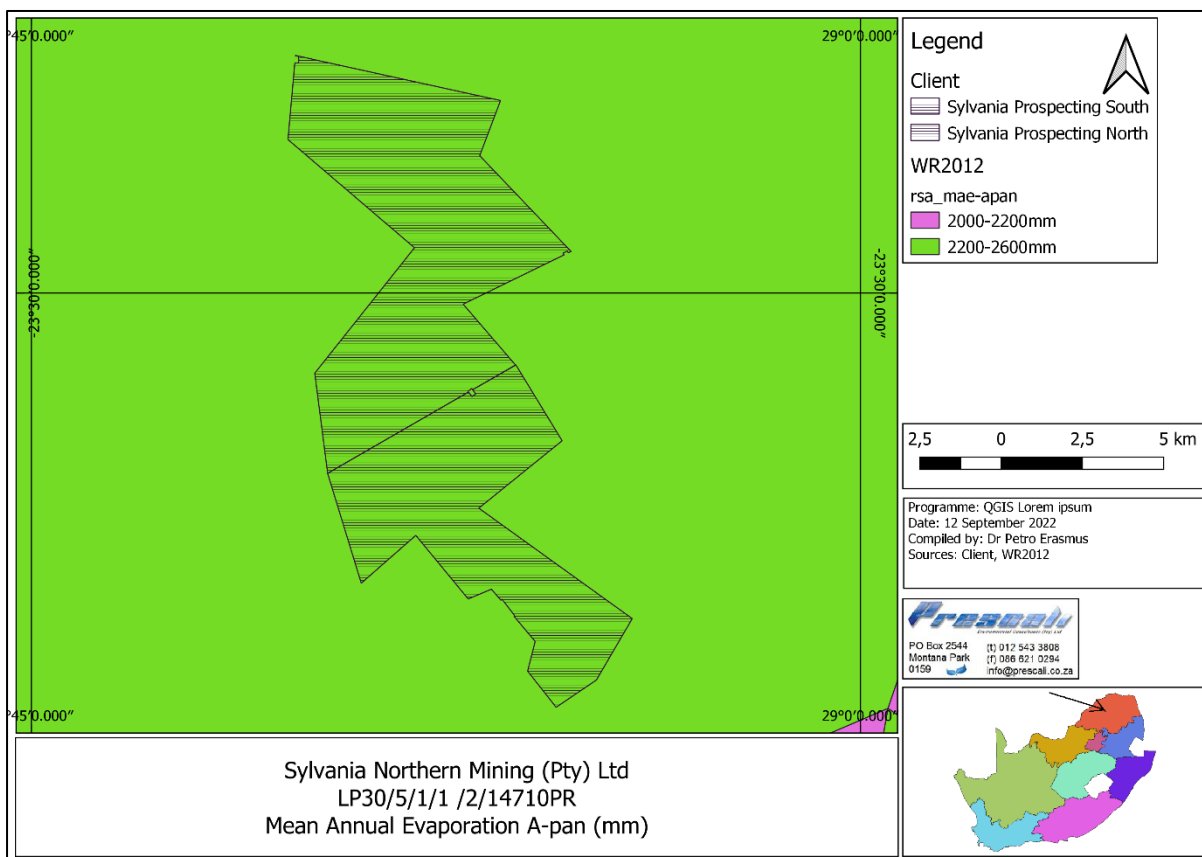


Figure 10-3: Mean Annual A-Pan Evaporation (WR2012)

## 10.2 TOPOGRAPHY

The topography of the prospecting rights application area is indicated in Figure 10-5 and Figure 10-4. With the exception of a Koppie located on Altona the area is relatively flat with an average slope of 0.4 – 0.7 on the northern farms and 1 to 1.2% on the southern farms.

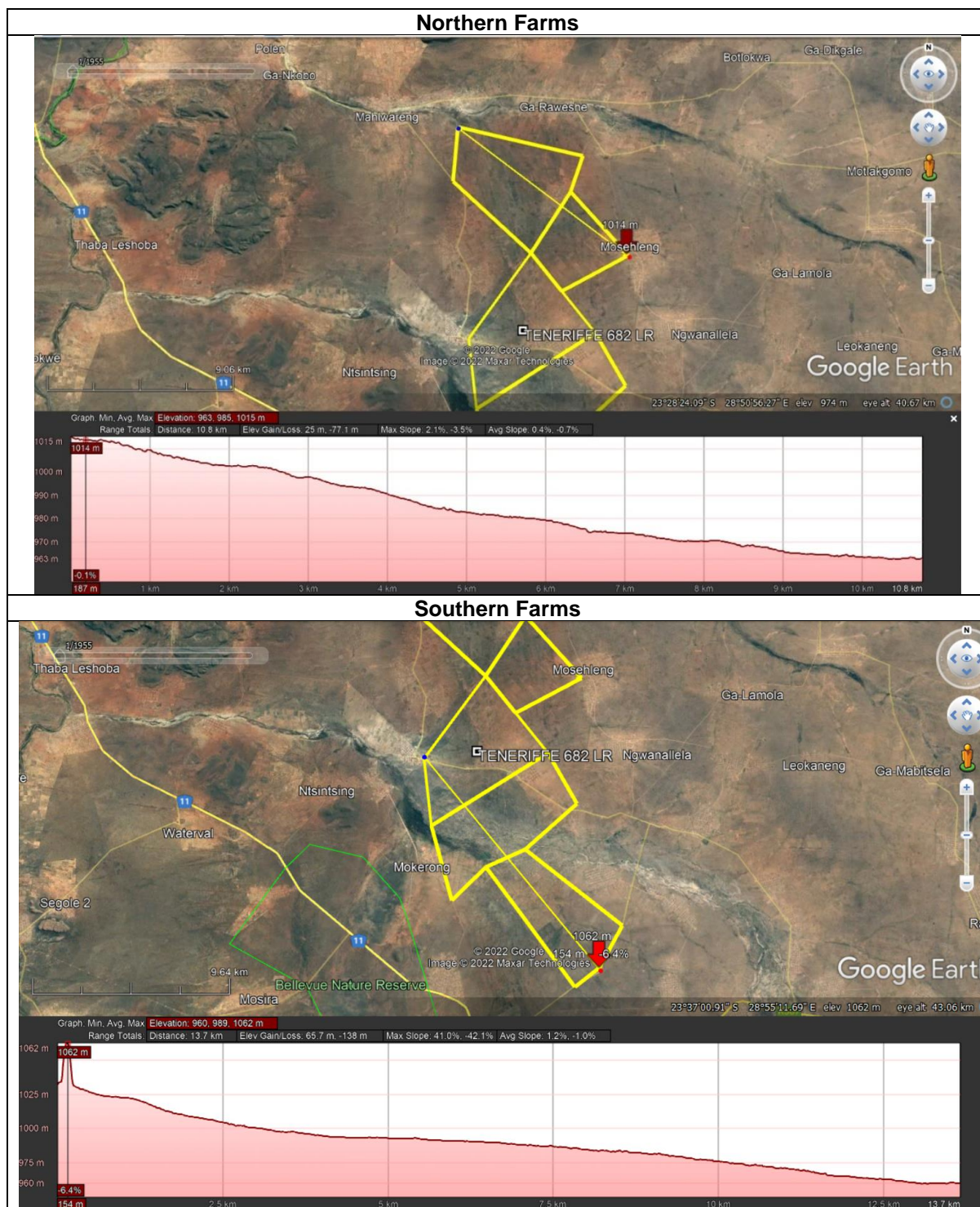


Figure 10-4: Topography profiles (Goole Earth™)



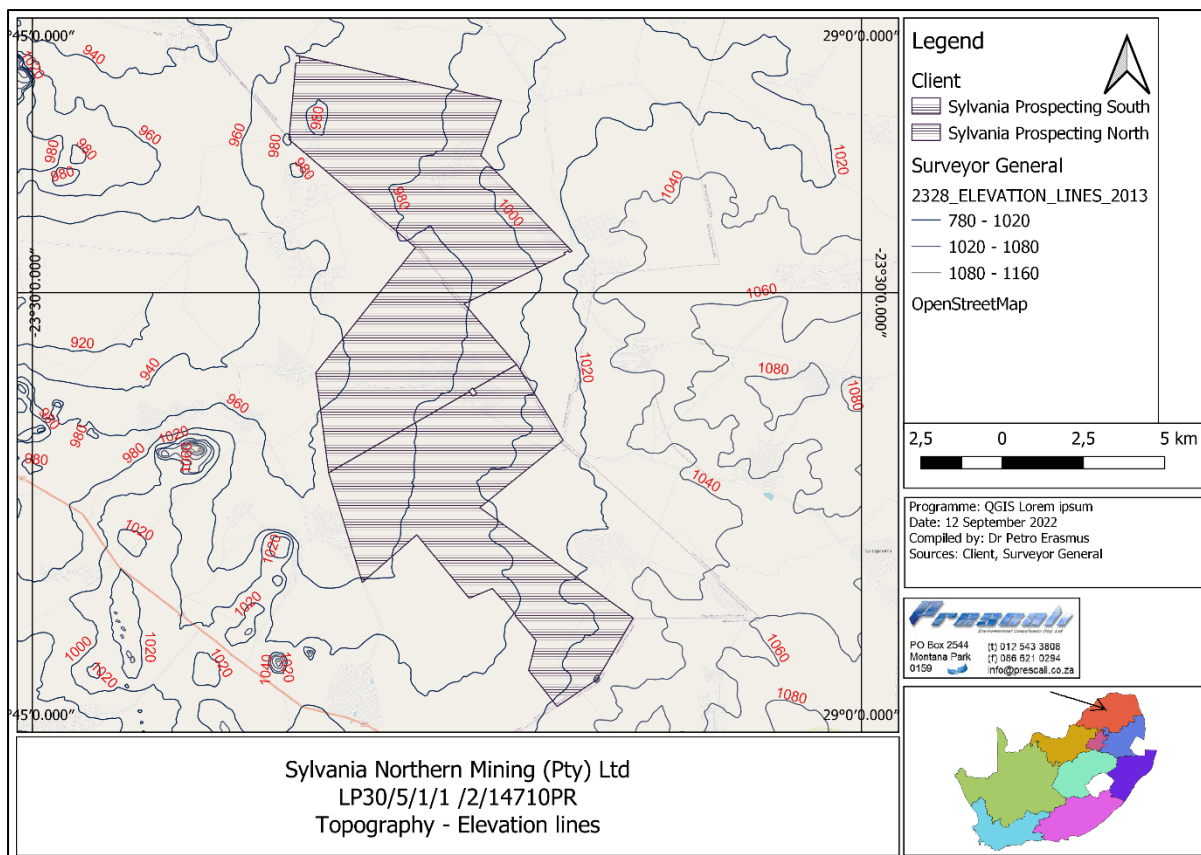


Figure 10-5 : Topography of the prospecting application area

### 10.3 GEOLOGY

Information in this section was sourced from the Prospecting Works Programme. The prospecting application area is underlain by the Main and Upper Zones of the Bushveld Igneous Complex.

At the base of the Main Zone of the Rustenburg Layered Suite (RLS), near its contact with the Archaean granite rocks, host PGM, Au, Co, Cu and Ni bearing sulphides which is located on the general strike with the Platreef found to the south of the project area. Mineralisation of the Platreef is developed north of the town of Mokopane as a 10–400 m thick package of generally pyroxenitic lithologies with Platinum Group Elements (PGE) and Ni-Cu base-metal sulphide (BMS) mineralisation, located at the base of the RLS and overlain by norites and gabbronorites assigned to the Main Zone. As the Platreef strikes northwards from Mokopane it rests upon a succession of progressively older units of the Transvaal Supergroup: quartzites and shales of the Silverton and Timeball Hill Formations; shales of the Deutschland Formation; the Penge banded iron formation; dolomites of the Malmani Subgroup; and finally, on the farm Zwartfontein, the Platreef rests on Archaean basement granites and gneisses.

The project area is located down-dip of the outcropping mineralization overlaying the Archaean Basement found on the farms Kransplaats, Nonnewerth and La Pucella located immediately to the east.

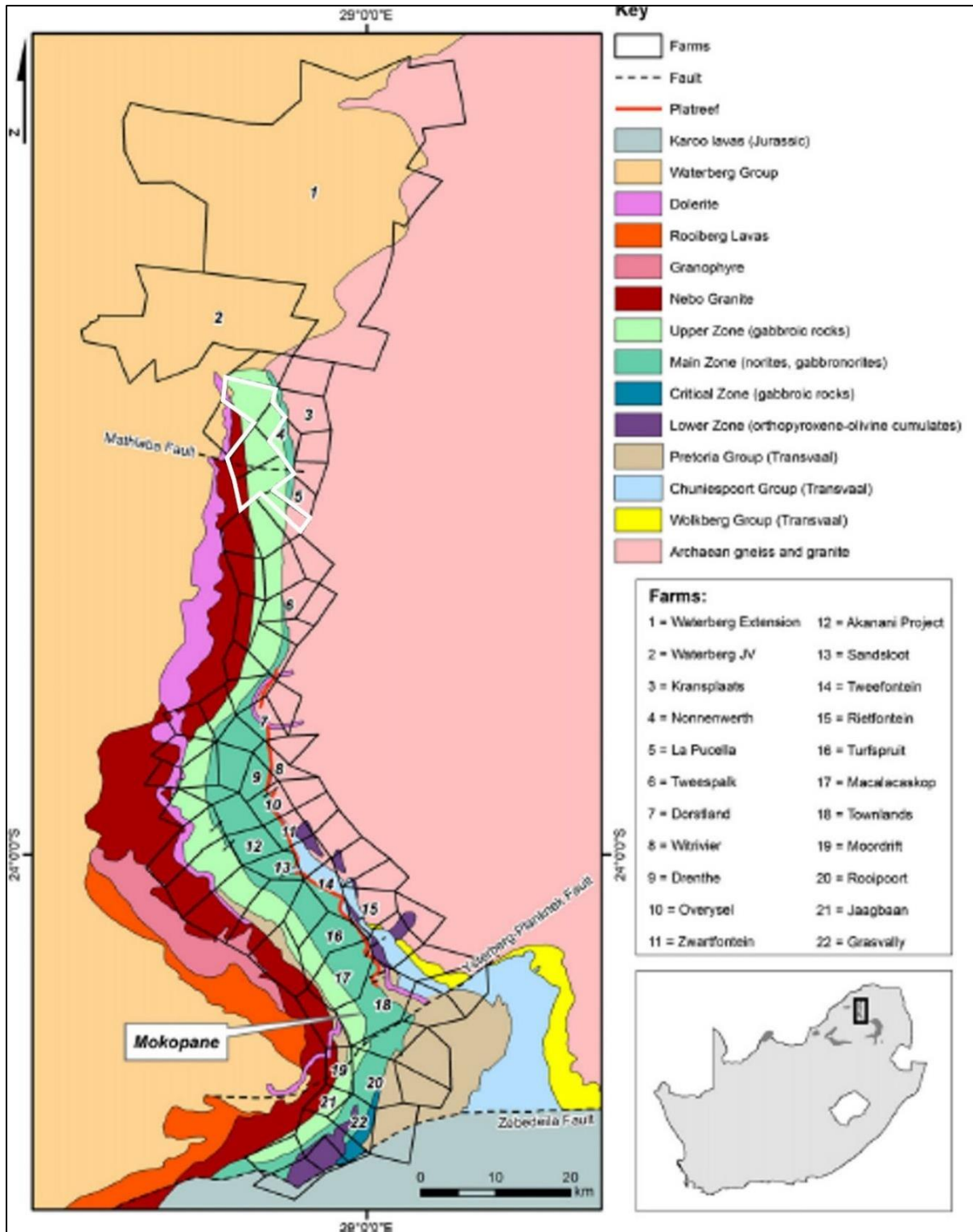


Figure 10-6 : Project area (in white), located in the north of the Northern Limb of the Bushveld Igneous Complex (after McDonald *et al*, 2016 as cited in the PWP)

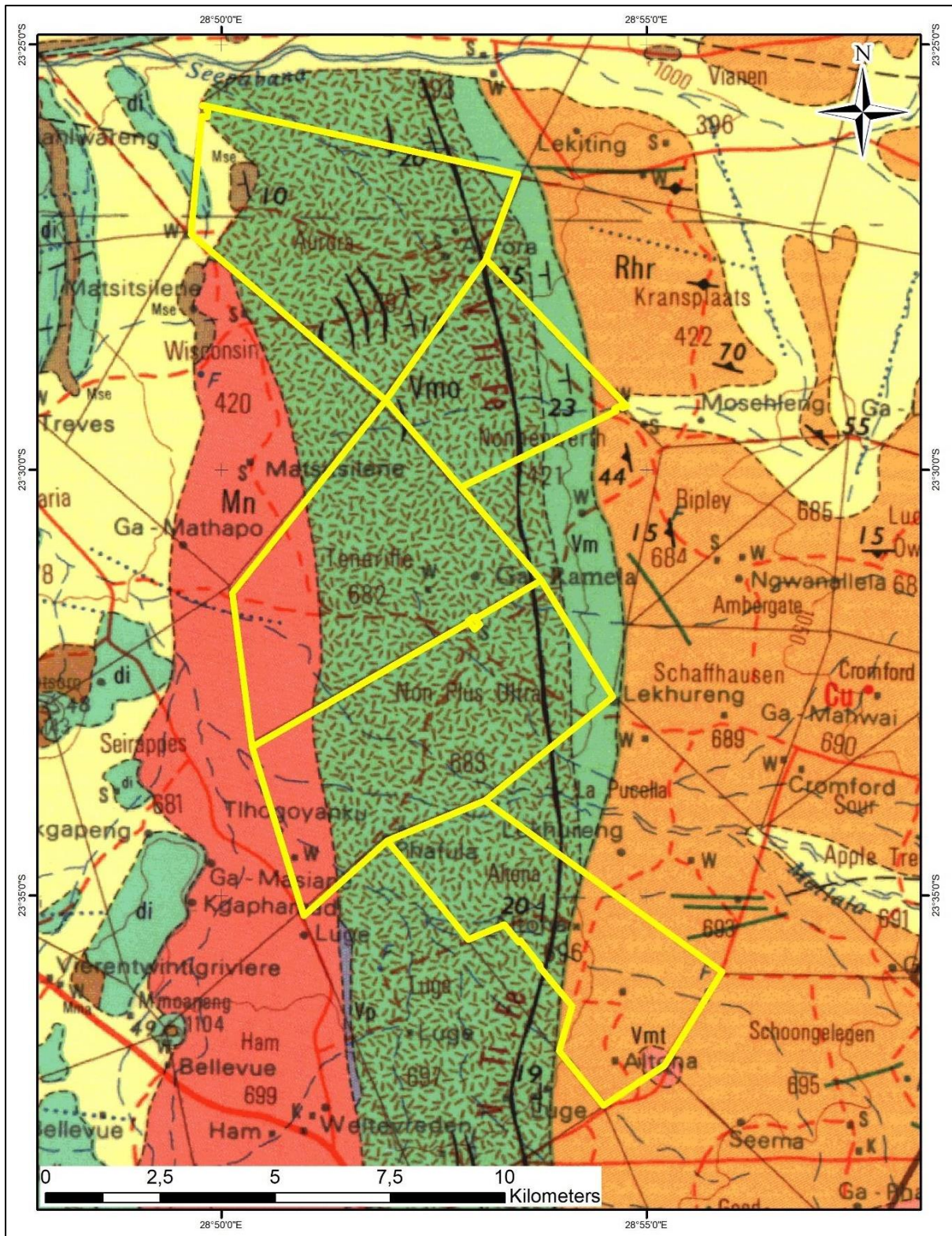
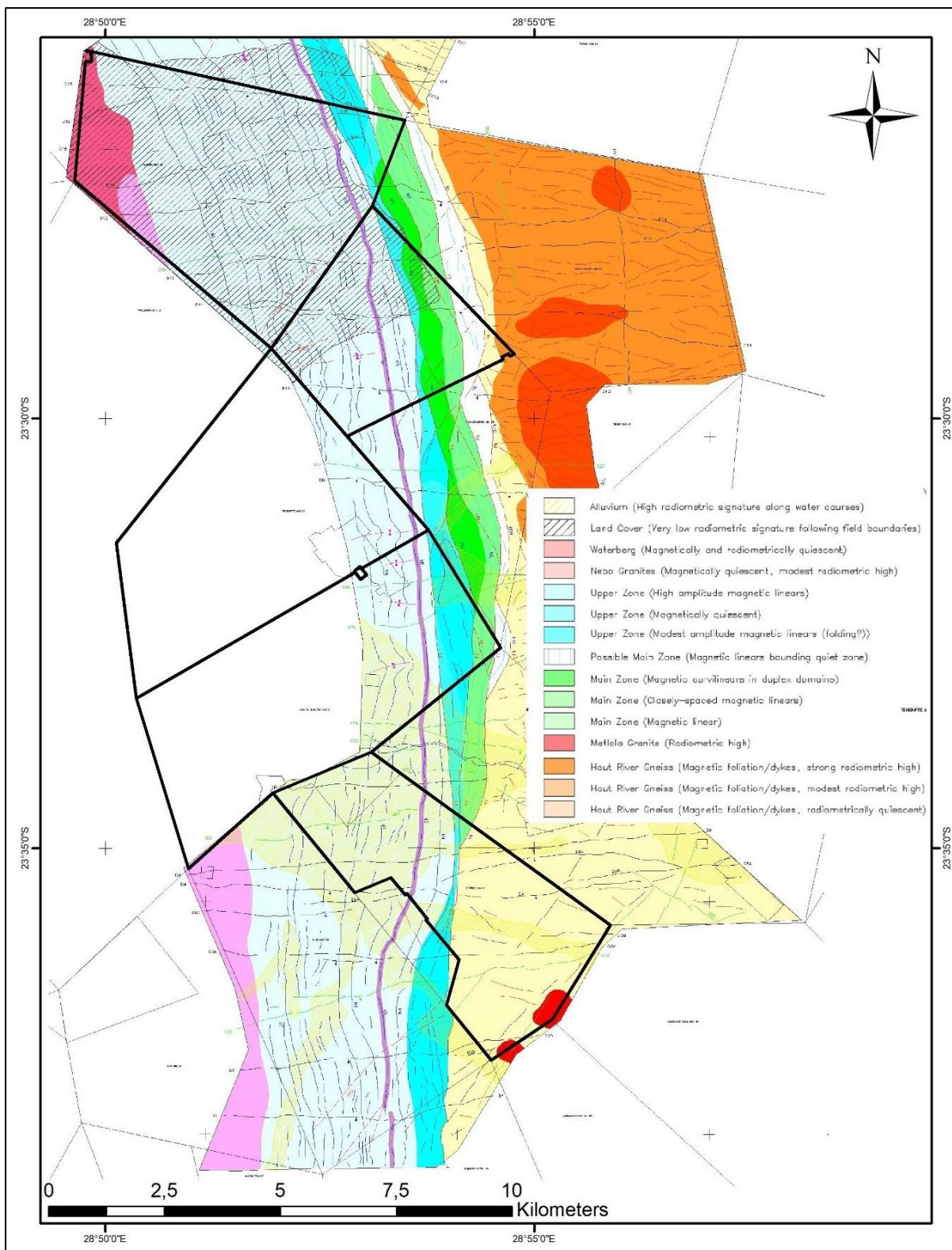


Figure 10-7: Geology of project area (yellow boundaries) from 1:250 000 Geology plan (2328 Pietersburg).



**Figure 10-8: Geophysics interpretation of geology over project area (Sylvania internal report, 2012 as cited in the PWP)**

#### 10.4 FLORA

A desktop study was conducted by RedKite Environmental Solutions (Pty) Ltd in 2022 to establish whether any potentially sensitive faunal species or species of conservation concern may possibly occur on site (Refer to Appendix 6).



#### 10.4.1 Biomes

The project area lies within the Savanna Biome, which is the largest biome in South Africa, covering 46% of the country (about 435 000 km<sup>2</sup>). It is a mixture of grasses and trees or shrubs. The Savanna Biome stretches from the Kalahari in the north-west across to the lowveld in the north-east and southwards to the lowlands of KwaZulu Natal and the Eastern Cape. It is found from sea level to about 2 000 metres above sea level. More than 5 700 plant species grow in the Savanna Biome. They include various types of grasses (e.g. Rooigras) and trees like the Baobab, Mopane, Camel Thorn and Knob Thorn.

#### 10.4.2 Vegetation Types

Two vegetation types (SANBI) occur in the project area, namely Makhado Sweet Bushveld (SVcb20) and Roodeberg Bushveld (SVcb18).

##### 10.4.2.1 Makhado Sweet Bushveld

The Makhado Sweet Bushveld vegetation type is found in the Limpopo Province and occurs on the plains south of the Soutpansberg, east of the Waterberg and on the apron surrounding the Blouberg and Lerataupje Mountains, and north of the Polokwane Plateau and west of the escarpment, with extensions to Mokopane to the south and to the north near Vivo. The vegetation type is found on slightly to moderately undulating plains sloping generally down to the north, with some hills in the southwest. Makhado Sweet Bushveld is characterised by short and shrubby bushveld with a poorly developed grass layer.

Expected common and dominant species in undisturbed vegetation includes the following (those with a "d" are considered to be dominant) (Mucina & Rutherford, 2006):

- Trees: *Senegalia erubescens* (d), *Vachellia gerrardii* (d), *Senegalia mellifera* subsp. *detinens* (d), *Vachellia rehmanniana* (d), *Boscia albitrunca* (d), *Combretum apiculatum* (d), *Vachellia tortilis* subsp. *heteracantha*, *Terminalia sericea*.
- Shrubs: *Commiphora pyracanthoides*, *Dichrostachys cinerea*, *Grewia flava*, *Hibiscus calyphyllus*, *Lycium shawii*, *Rhigozum obovatum*, *Barleria lancifolia*, *Hirpicium bechuanense*, *Indigofera poliototes*, *Melhania rehmannii*, *Pechuel-Loeschea leubnitziae*.
- Graminoids: *Anthephora pubescens* (d), *Aristida stipitata* subsp. *gracilliflora* (d), *Cenchrus ciliaris* (d), *Enneapogon scoparius* (d), *Brachiaria nigropedata*, *Eragrostis trichophora*, *Panicum coloratum*, *P. maximum*, *Schmidtia pappophoroides*, *Urochloa mosambicensis*.
- Herbs: *Chamaecrista absus*, *Corbichonia decumbens*, *Geigeria acaulis*, *Harpagophytum procumbens* subsp. *transvaalense*, *Heliotropium steudneri*, *Hemizygia elliotii*, *Hermbstaedtia odorata*, *Leucas sexdentata*, *Osteospermum muricatum*, *Tephrosia purpurea* subsp. *leptostachya*.

##### 10.4.2.2 Roodeberg Bushveld

The Roodeberg Bushveld vegetation type is located in the Limpopo Province, straddling the Tropic of Capricorn. The vegetation type occurs from Marken and Villa Nora in the south through Baltimore to near Swartwater in the north and to the plains around the base of the Blouberg and Lerataupje Mountains in the northeast. The vegetation type is characterised by plains and slightly undulating plains, including some low hills, with short, closed woodland to tall open woodland and poorly developed grass layer.

Expected common and dominant species in undisturbed vegetation includes the following (those with a "d" are considered to be dominant) (Mucina and Rutherford, 2006):

- Trees: *Senegalia burkei* (d), *S. nigrescens* (d), *Vachellia robusta* (d), *V. erioloba*, *Sclerocarya birrea* subsp. *caffra*, *Senegalia erubescens* (d), *S. mellifera* subsp. *detinens* (d), *Vachellia nilotica* (d), *V. tortilis* subsp. *heteracantha* (d), *Combretum apiculatum* (d), *Kirkia acuminata* (d), *Vachellia grandicornuta*, *V. luederitzii* var. *retinens*, *Senegalia senegal* var. *leiorhachis*, *Albizia harveyi*, *Combretum imberbe*, *Commiphora mollis*, *Searsia lancea*, *Terminalia sericea*, *Ziziphus mucronata*.

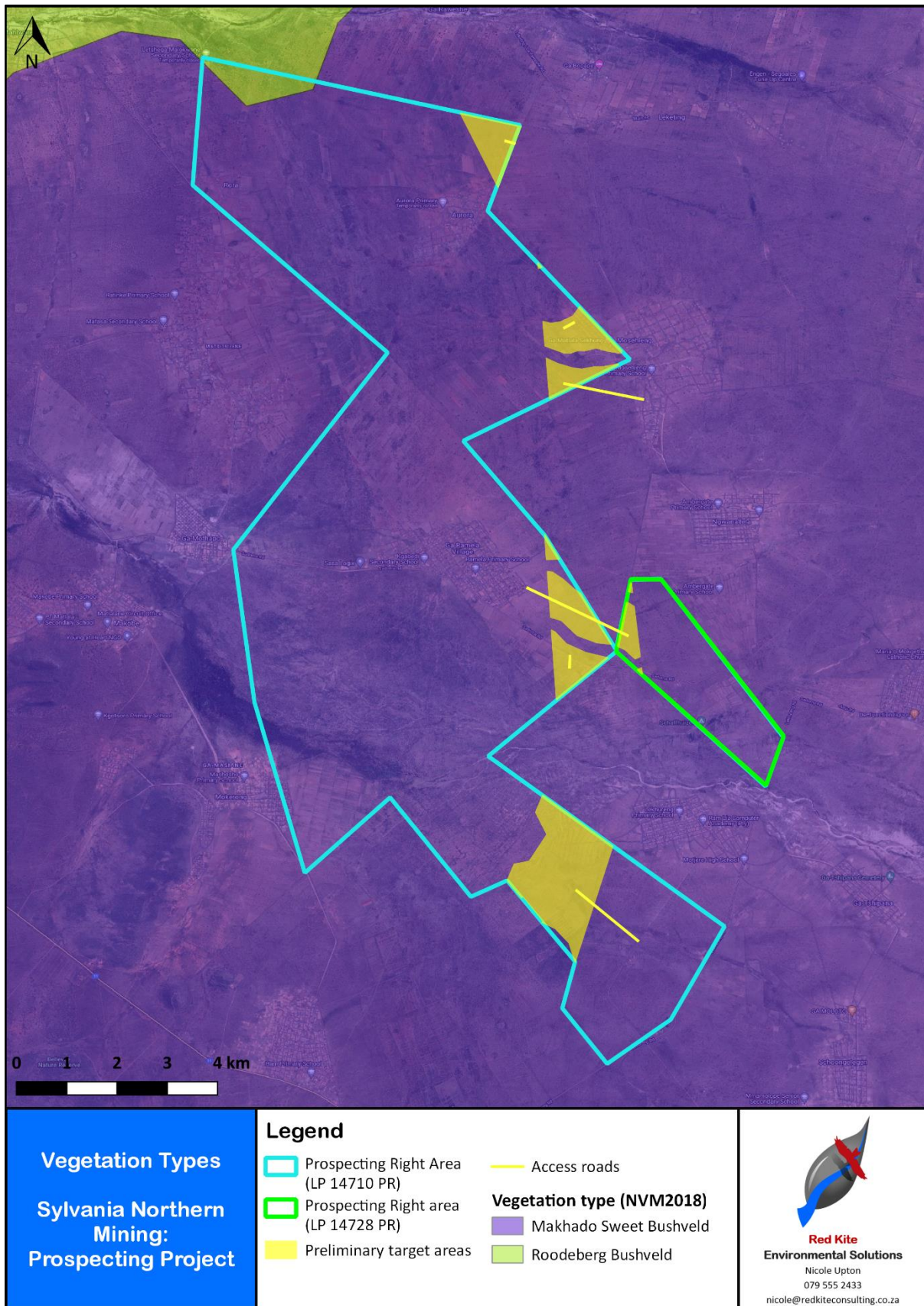


Figure 10-9: Vegetation types of the study site

- Shrubs: *Dichrostachys cinerea* (d), *Grewia flava* (d), *Euclea crispa* subsp. *crispa*, *E. undulata*, *Grewia monticola*, *Hibiscus micranthus*, *Commiphora africana*, *Melhania acuminata*, *Sida cordifolia*, *Solanum delagoense*.



- Graminoids: *Aristida canescens* (d), *Chloris virgata* (d), *Digitaria eriantha* subsp. *eriantha* (d), *Enneapogon cenchroides* (d), *Eragrostis rigidior* (d), *Panicum maximum* (d), *Urochloa mosambicensis* (d), *Aristida congesta*, *Brachiaria deflexa*, *Cymbopogon pospischilii*, *Cynodon dactylon*, *Eragrostis rotifer*.
- Herbs: *Achyranthes aspera*, *Corbichonia decumbens*, *Hemizygia elliotii*, *Kyphocarpa angustifolia*, *Seddera capensis*, *Tephrosia purpurea* subsp. *leptostachya*, *Waltheria indica*.

#### 10.4.3 Vegetation Conservation Status

The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under NEMBA, lists national vegetation types that are afforded protection on the basis of rates of transformation. Both vegetation types occurring on the project area are not listed in the “National List of Ecosystems that are Threatened and need of protection”, and as Least Concern by the 2018 National Biodiversity Assessment.

There is one main conservation management plan for the province, namely the Limpopo Conservation Plan (LCP) (LCPv2, 2013 as cited by Red Kite). The LCP comprises two spatial components: (i) maps of terrestrial and freshwater critical biodiversity areas (CBAs); and (ii) a set of land-use guidelines that are important for maintaining and supporting the inherent biodiversity values of these critical biodiversity areas. The LCP has been updated consecutively and individually for the Waterberg (2015), Mopani (2016), Vhembe (2017), Sekhukhune (2018) and Capricorn (2018) district municipalities as part the compilation of bioregional plans for these municipalities. Each bioregional plan produced an updated Critical Biodiversity Area (CBA) map for the district. Protection of the priority areas identified in the LCP and bioregional plans would contribute to meeting national biodiversity targets for the South African vegetation types.

The Prospecting Right areas contains the following classes from the LCP and District Bioregional Plans: CBA1<sup>16</sup>, CBA2<sup>17</sup>, Ecological Support Area (ESA) ESA1<sup>18</sup>, ESA2<sup>19</sup>, No Natural Remaining (NNR<sup>20</sup>) and Other Natural Area (ONA<sup>21</sup>). However, the majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 is located on areas categorised as CBA2 and ESA2. No protected areas in terms of the NEMPAA are located within 10 km of the project area and the Limpopo Central Bushveld NPAES is located approximately 7.4 km south-west of the project area. The north-eastern section of the Prospecting Right area is located in the transition zone of the Vhembe Biosphere Reserve.

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<sup>16</sup> (CBA1): Irreplaceable Sites. Areas required to meet biodiversity pattern and/or ecological processes targets. No alternative Sites are Available to Meet targets. Maintain In a natural state with limited or no biodiversity loss. Rehabilitate degraded areas to a natural or near natural state, and manage for no further degradation.

<sup>17</sup> (CBA2): Best Design Selected Sites. Areas selected to meet biodiversity pattern and/or ecological process targets. Alternative sites may be available to meet targets. Maintain in a natural state with limited or no biodiversity loss. Maintain current agricultural activities. Ensure that land use is not intensified and that activities are managed to minimize impact on threatened species.

<sup>18</sup> (ESA1): Natural, Near natural and degraded areas supporting CBAs by maintaining Ecological processes. Maintain ecosystem functionality and connectivity allowing for limited loss of biodiversity pattern.

<sup>19</sup> (ESA2): Areas with no natural habitat that is important for supporting ecological processes. Avoid additional / new impacts on ecological processes.

<sup>20</sup> Areas with no significant direct biodiversity value. Not Natural or degraded natural areas that are not required as ESA, including intensive agriculture, urban, industry; and human infrastructure. No management objectives, land management recommendations or land-use guidelines are prescribed.

<sup>21</sup> Natural and intact but not required to meet targets, or identified as CBA or ESA. No management objectives, land management recommendations or land-use guidelines are prescribed.

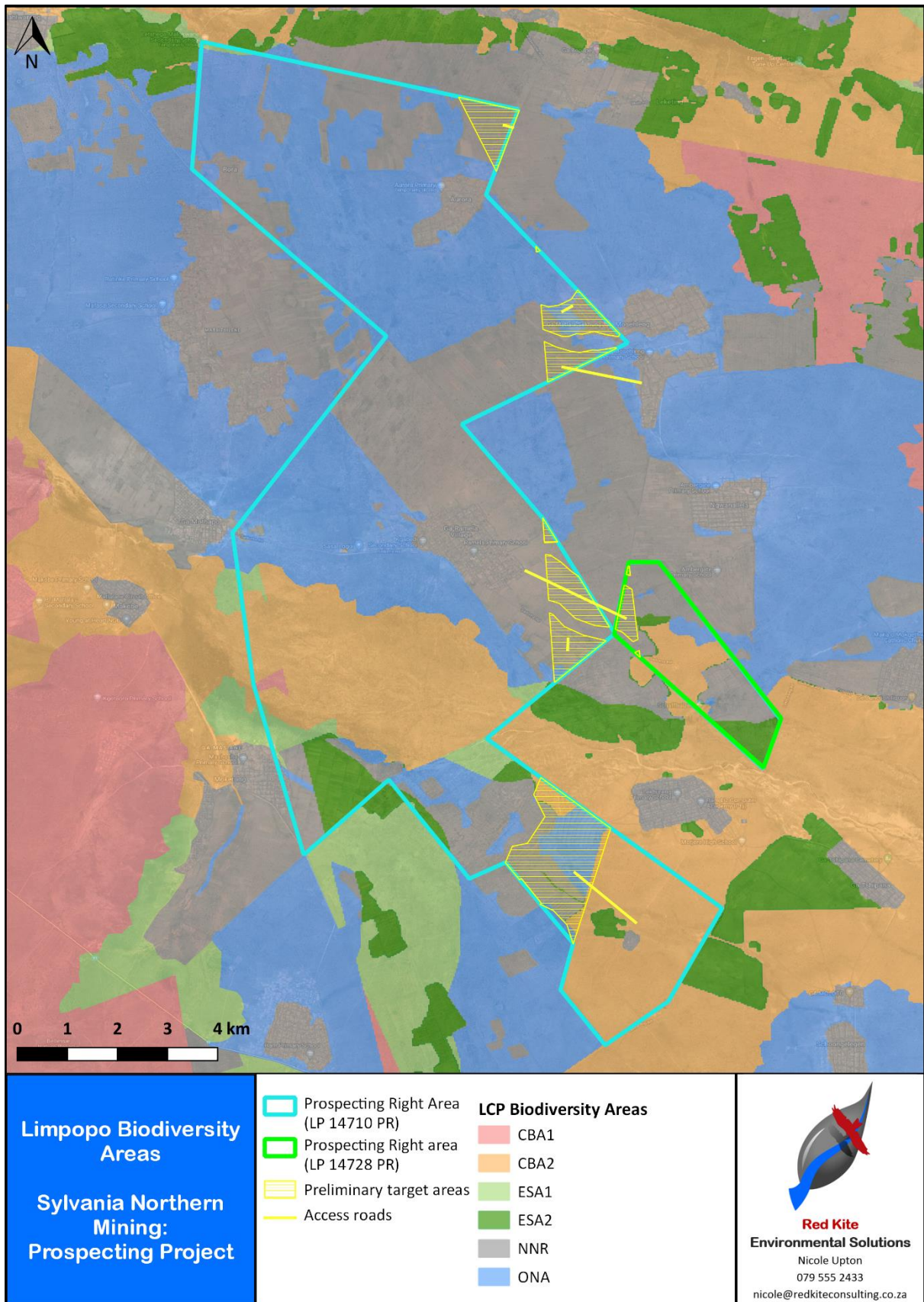


Figure 10-10: LCP (v2) Biodiversity areas on the project area



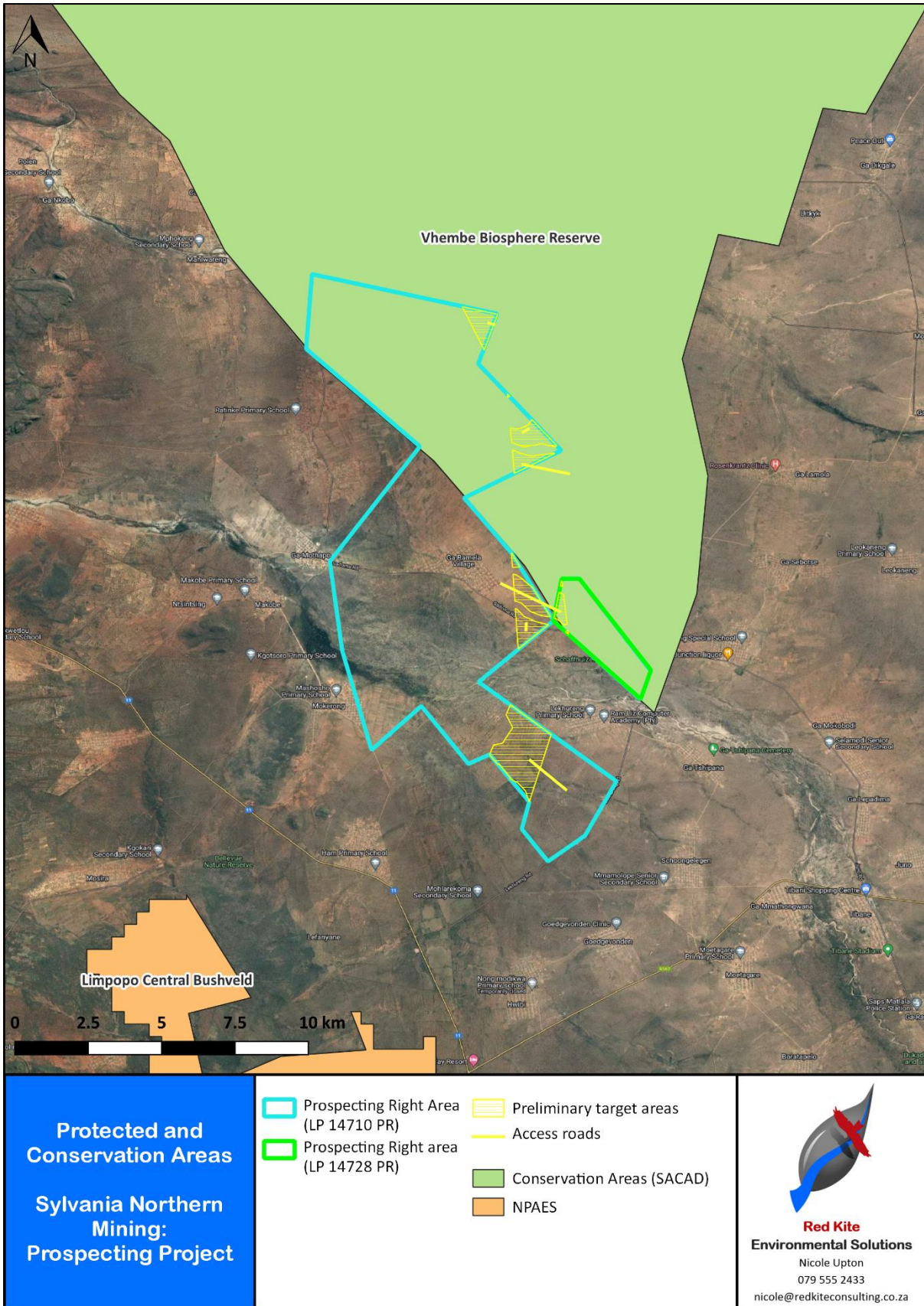


Figure 10-11: Protected and conservation areas

#### 10.4.4 POSA Plant Species

Information on plant species previously recorded for the project area was extracted from the POSA online database hosted by SANBI. A list of plant species that have previously been recorded in the project area is provided in Appendix C of the RedKite reports (in Appendix 6). The results indicate that



78 plant species have been recorded in the area queried, consisting of 13 families. The most prominent family is Poaceae, with 60 species.

Of the 78 species previously recorded for the area, none are Species of Conservation Concern (SCC) in terms of their Red List status. Furthermore, the Environmental Screening Tool Report for the project area does not list any SCC. The aforementioned is supported by the findings of previous ecology assessments undertaken on the project area (M2 Environmental Connections, 2014 & Scientific Aquatic Services, 2013 as cited by Red Kite). None of the flora species recorded on POSA for the area are listed as protected in the LEMA.

Three protected species, in terms of the NFA, has been recorded on POSA for the area queried, namely:

- *Boscia albitrunca* (Shepherd's tree)
- *Combretum imberbe* (Leadwood)
- *Sclerocarya birrea* (Marula)

The above protected tree species as well as *Vachellia erioloba* (Camel thorn) were identified to occur on the project footprint during previous studies carried out on the project footprint (M2 Environmental Connections, 2014 & Scientific Aquatic Services, 2013 as cited by Red Kite).

Four of the flora species recorded on POSA for the area are known to have medicinal uses:

- *Ehretia rigida*: Puzzle bush (Eng.); Deurmekaarbos (Afr.); umHlele (Zulu); Morobe (Northern Sotho); iBotshane (Xhosa); Mutepe (Venda);
- *Sclerocarya birrea*: Marula
- *Senna italica*: Eland's Pea (e), Swartstorm (a), Wild Senna (e), Wilde Ertjies (a)
- *Terminalia sericea*: Mususu (Venda); Silver cluster-leaf or Silver terminalia (Eng.); Vaalboom (Afr.)

Various additional flora species that have medicinal or cultural uses were identified to occur on the project footprint during previous studies carried out on the project footprint (M2 Environmental Connections, 2014 & Scientific Aquatic Services, 2013).

None of the flora species listed on POSA for the project area are endemic to South Africa.

## 10.5 FAUNA

A desktop study was conducted by RedKite in 2022, to establish whether any potentially sensitive faunal species or species of conservation concern (SCC) may possibly occur on site. The Virtual Museum and Animal Demography Unit (ADU) was used to compile species lists based on the sightings and data gathered from the South African Biodiversity Institute for the 328BD and 2328DB Quarter Degree Squares (QDS). The avifaunal species list was obtained from SABAP2 for the pentads applicable to the project area.

It is important to note that a QDS covers a large area:  $\pm 27 \times 25$  km ( $\pm 693$  km<sup>2</sup>) and a pentad (SABAP2 Protocol) an area of  $\pm 8 \times 7.6$  km ( $\pm 60.8$  km<sup>2</sup>) and it is possible that suitable habitat will exist for a certain Red Data avifaunal species within this wider area surrounding the study site. However, the specific habitat(s) found on site may not suit Red Data species, even though it has been recorded for the QDS or pentad.

Species and habitat were identified as possibly sensitive within the framework of this study. Sensitive species were determined according to their close relationship and dependence on the vegetation type and habitat found to occur on the project site.

Appendix D in the Specialist report list the faunal species for the five QDS applicable to the project. National SCC include mammalian, reptilian, amphibian and avifaunal species which are known to occur in the regional area where the project is proposed (Table 10-2).

**Table 10-2: Fauna SCC found in QDS that may be relevant to the Sylvania Northern Mining PR**

Scientific Name	Common Name	Red Data List Category
<b>Mammalia</b>		
<i>Mellivora capensis</i>	Honey Badger	LC, LEMA Schedule 3 Protected, TOPS 2007
<i>Crocidura maquassiensis</i>	Makwassie musk shrew	VU (2016) - As per Screening Tool Report
<i>Dasymys robertsii</i>	Robert's Marsh Rat	NT (2016)- As per Screening Tool Report
<b>Avifauna</b>		
<i>Oxyura maccoa</i>	Duck, Maccoa	NT (Regional), VU (Global)
<i>Falco biarmicus</i>	Falcon, Lanner	VU (Regional), LC (Global)
<i>Certhilauda chuana</i>	Lark, Short-clawed	NT (Regional), LC (Global)
<i>Ciconia nigra</i>	Stork, Black	VU (Regional), LC (Global)
<i>Gyps coprotheres</i>	Vulture, Cape	EN (Regional), EN (Global), TOPS EN
<i>Torgos tracheliotos</i>	Vulture, Lappet-faced	EN (Regional), EN (Global), TOPS EN
<i>Gyps africanus</i>	Vulture, White-backed	CR (Regional), CR (Global), TOPS EN
<i>Aquila rapax</i>	Eagle, Tawny	EN (Regional), LC (Global), Flagged by STR
<b>Reptiles</b>		
<i>Platysaurus monotropis</i>	Orange-throated Flat Lizard	EN (SARCA 2014), LEMA Schedule 3
<i>Homopholis mulleri</i>	Muller's Velvet Gecko	VU (SARCA 2014), LEMA Schedule 3
<i>Lygodactylus soutpansbergensis</i>	Soutpansberg Dwarf Gecko	NT (SARCA 2014), LEMA Schedule 3
<b>Amphibian</b>		
<i>Pyxicephalus edulis</i>	African/Lesser Bull Frog	LC (SARCA 2014), LEMA Schedule 3, TOPS 2007

### 10.5.1 Mammals

According to the SANBI Animal Demographic Unit (ADU), one (1) mammal species was found to possibly occur in the area queried, which is a provincial SCC (LEMA) and listed Nationally under TOPS 2007:

Honey Badger	<i>Mellivora capensis</i>	LC TOPS LEMA Schedule 3 Protected
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Two (2) additional mammalian SCC were listed in the Environmental Screening Tool Report for the project:

Makwassie musk shrew)	<i>Crocidura maquassiensis</i>	VU (2016)
Robert's Marsh Rat)	<i>Dasymys robertsii</i>	NT (2016)

### 10.5.2 Avifaunal

According to data collected during the Southern African Bird Atlas Project 2 (SABAP2), the site is located within pentads 2325\_2845, 2325\_2850, 2330\_2850 and 2335\_2850 and hundred and sixty-eight (168) bird species have been recorded to occur within this area.

Eight (8) avifaunal SCC were listed for the area queried:

Duck, Maccoa	<i>Oxyura maccoa</i>	NT (Regional), VU (Global)
Falcon, Lanner	<i>Falco biarmicus</i>	VU (Regional), LC (Global)
Lark, Short-clawed	<i>Certhilauda chuana</i>	NT (Regional), LC (Global)
Stork, Black	<i>Ciconia nigra-</i>	VU (Regional), LC (Global)
Vulture, Cape	<i>Gyps coprotheres</i>	EN (Regional), EN (Global)
Vulture, Lappet-faced	<i>Torgos tracheliotos</i>	EN (Regional), EN (Global)
Vulture, White-backed	<i>Gyps africanus-</i>	CR (Regional), CR (Global)
Eagle, Tawny-	<i>Aquila rapax-</i>	EN (Regional), LC (Global)

The site is located a significant distance away from Important Birding and Biodiversity Areas (IBAs). The Waterberg IBA is located 45 km south-west of the project area and the Blouberg IBA is located 30 km north of the project area.

### 10.5.3 Butterflies

Thirteen (13) butterfly species were recorded in for the 2328BD and 2328DB QDS, all of which were categorized as LC by SANBI.

### 10.5.4 Other Invertebrates

Three (3) Dung beetle species were recorded for the QDS, all of which were categorized as LC by SANBI.

### 10.5.5 Reptiles

Thirty-six (36) reptile species were recorded for the QDS. Three (3) of the species have are SCC:

Orange throated Flat Lizard	<i>Platysaurus monotropis</i>	Endangered (SARCA 2014)
Muller's Velvet Gecko	<i>Homopholis mulleri</i>	Vulnerable (SARCA 2014)
Soutpansberg Dwarf Gecko	<i>Lygodactylus soutpansbergensis</i>	Near Threatened (SARCA 2014)

Almost all species of Reptiles are protected in terms of LEMA: Schedule 3, excluding the water monitor, rock monitor, and all indigenous snakes not listed in the Act otherwise.

### 10.5.6 Amphibians

Nine (9) amphibian species were reported within the QDS, of which one is listed as an SCC in terms of TOPS 2007:

African/ Lesser Bull Frog	<i>Pyxicephalus edulis</i>	Least Concern (SARCA 2014), LEMA Schedule 3, TOPS 2007
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## 10.6 SURFACE WATER

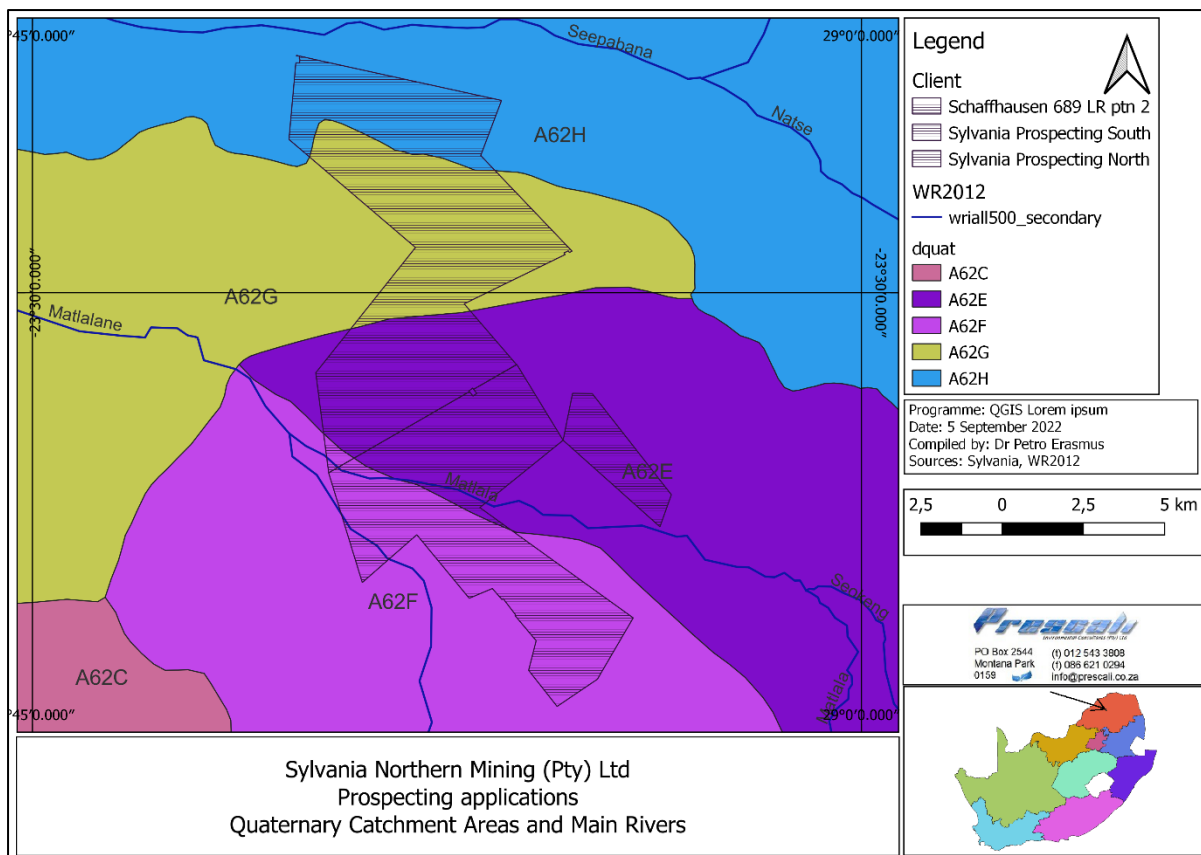
Desktop surface water assessment was conducted by Prescali (Prescali, 2022), refer to Appendix 6.

### 10.6.1 Affected River basin

The Sylvania Northern Mining (Pty) Ltd Mine Prospecting Right application area is situated in the Limpopo Water Management Area (WMA) (A primary catchment), specifically quaternary catchment A62E, A62F, A62G and A62H of the Mogalakwena River catchment (Figure 10-12) (DWAF, 2004).

From the 2016 reconciliation strategy (Lombaard, J., 2016), the Mogalakwena River (A61 to A63) catchment has limited surface water resources but large groundwater resources, which have already been extensively exploited by the irrigation sector. The mining sector is expanding rapidly in this catchment and the water supply to these mines must be secured as a matter of priority. Additional water resources are groundwater and transfers from the Olifants River catchment.





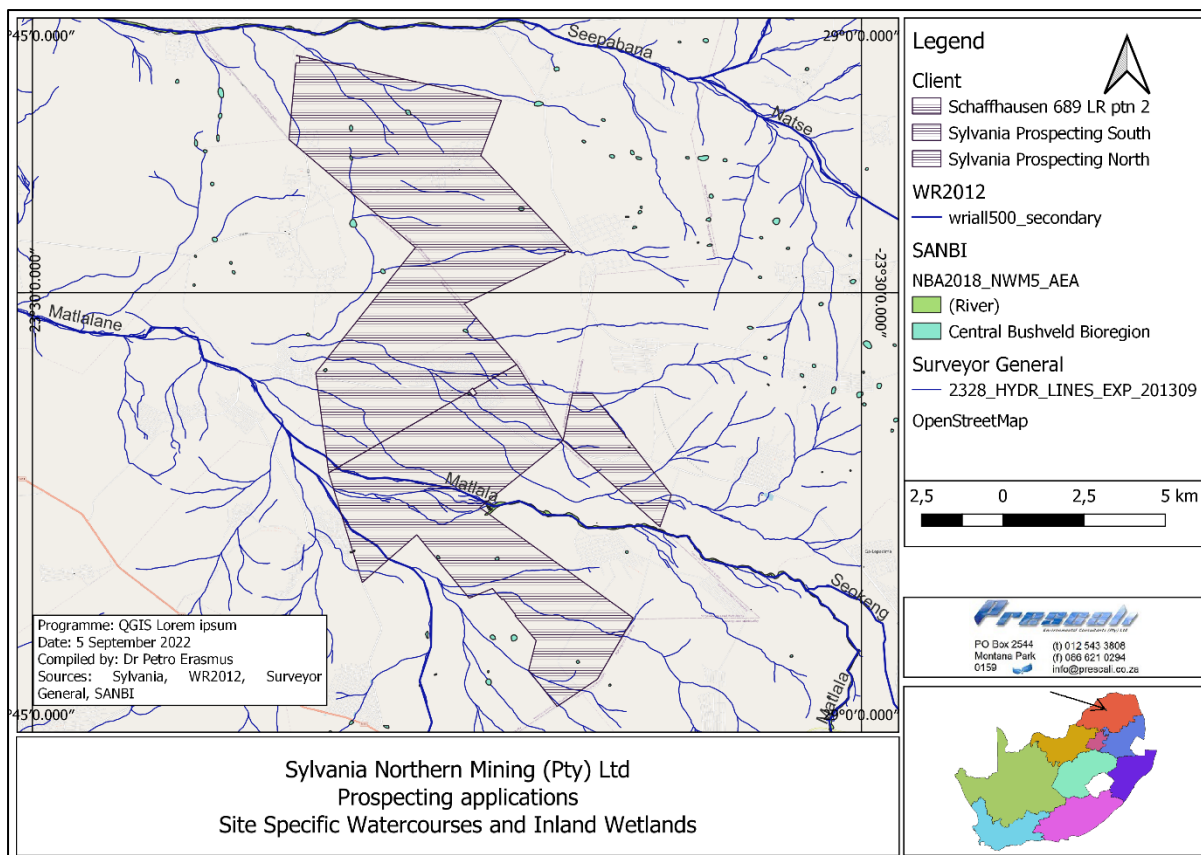
**Figure 10-13: Quaternary catchments and primary and secondary Rivers (WR2012)**

Though the Mogalakwena catchment has a large potential for growth, it has insufficient water supply to meet current needs and the Doorndraai Dam is over-allocated, while all water resources in the Mogalakwena catchment have been fully developed.

The middle of this catchment is densely populated with informal settlements that are mainly supplied from groundwater, posing a risk to surface water quality, as well as groundwater quality due to the high concentration of pit latrines. This can lead to long-term contamination of underlying aquifers with *E.coli* and nitrate as well as unsafe concentrations of bacteria, viruses and chemicals.

Groundwater is also threatened by mine water decant and naturally occurring fluorides emanating from the underlining granite in some areas. With an increase of development within the mining sector the potential of more mine water decant is a high risk. Additional water quality determinants associated with the gold and base-metal mines as well as smelters are antimony, pH, TDS, total suspended solids (TSS) and tin.

Large scale irrigation around the dams in this catchment can lead to deterioration of water quality due to runoff of potential agro-chemical pollutants into the water source.



**Figure 10-14: Location of Sylvania Northern Mining (Pty) Ltd site-specific surface water resources and inland wetland areas**

The Mean Annual Evaporation, Mean Annual precipitation and MAR for the applicable quaternary catchments are indicated in Table 10-3.

**Table 10-3: Applicable catchment areas MAR, MAP and MAE information (Baily & Pitman, 2015)**

Area	Catchment area		MAE (mm) (S-pan)	MAP (mm)	MAR (million m <sup>3</sup> /a)
	Gross (km <sup>2</sup> )	Net (km <sup>2</sup> )			
A62	5795	5584	1883	479	75,99
A62E	621	621	1850	460	5,51
A62F	620	620	1850	478	3,35
A62G	627	539	1900	437	6,22
A62H	871	871	1900	439	5,88
A62E PAA	39,9015				0,354
A62F PAA	25,9748				0,140
A62G PAA	25,9264				0,257
A62H PAA	14,4352				0,097

### 10.6.3 River Resource Classification

The ecological status (EcoStatus) of a river refers to its overall condition or health, i.e., the totality of the features and characteristics of the river and its riparian areas, which manifests in its ability to support a natural array of species. This ability relates directly to the capacity of the system to provide a variety of goods and services.

The Minister of Water and Sanitation is required to establish a classification system, and to determine the class and resource quality objectives for all or part of the resources considered to be significant.

From the desktop data assessment it can be seen that the Present Ecological Status (PES) for both the rivers close to the prospecting right area decreased in classification from the 1999 assessment to the 2018 assessment. The Ecological Importance and Sensitivity Class (EI and ES) of the rivers in the applicable reaches are Moderate and Very Low respectively<sup>22</sup> (Figure 10-15).

**Table 10-4: Classification of the River Reaches (CSIR, 2018) (CSIR, 2011)**

	<b>Matlala</b>	<b>Seepabana</b>	<b>Mogalakwena</b>
Flow	Ephemeral	Perennial	Perennial
Order	2	2	3
Mainstem	1	1	1
PES1999	B: Large Natural	B: Largely Natural	D
Ecoregion	5	1	1
Geomorphic Zone	E	D	F
River Type	5_N_L	1_P_U	1_P_F
FFRID	0	0	0
FFRREGION	0	0	0
FFRFlagship	0	0	0
PES_2018	C	D	D
NBA2018ETS	CR	LT	CR
NBA2018PL	NP	WP	PP
FRID_2018	0	0	0
FRFAG_2018	0	0	0
FEPA Code	4	4	2

- FFRID: Free flowing river identification. Each system and its tributaries have the same identifier.
- FFRREGION: The lumped ecoregion into which free-flowing rivers fall, used to achieve representation of free-flowing rivers across the country.
- FFRFlagship: Flagship free-flowing rivers as identified through an expert review process.
- PES\_2018: Data that became available between 2011 and 2017 from Reserve or Ecological Water Requirement (EWR) and Water Resource Classification System (WRCS) studies.
- NBA2018ETS: Ecosystem threat status (ETS) of river ecosystem types: this was based on the extent to which each river ecosystem type had been altered from its natural condition.
- NBA2018PL: Ecosystem protection level (EPL) of river ecosystem types: river ecosystem types in protected areas needed to be in good condition rivers (A or B ecological category) to be considered as protected. Well protected, moderately protected, poorly protected river ecosystem types have at least 100%, 50%, 5% of their biodiversity target in protected areas and in natural or near-natural ecological condition; not protected river ecosystem types have < 5%.
- FRID\_2018: Free-flowing river ID. Each system and its tributaries have the same identifier.
- FRFAG\_2018: In NBA 2018 where no river condition changes were recorded the free-flowing/flagship rivers remained unchanged.

Ecoregion 1 (39 383,5 km<sup>2</sup>), Limpopo Plain, consists of plains and lowlands with a low to moderate relief. Vegetation consists mainly of Bushveld types and Mopane veld (Kleynhans, Thirion, & Moolman, 2005).

Ecoregion 5 (7 245.9 km<sup>2</sup>), Northern Plateau have the following vegetation types: Mixed Bushveld (main); Clay Thorn Bushveld (limited) and North Eastern Mountain Grassland (Limited). The topography is dominated by plains with low to moderate relief (Kleynhans, Thirion, & Moolman, 2005).

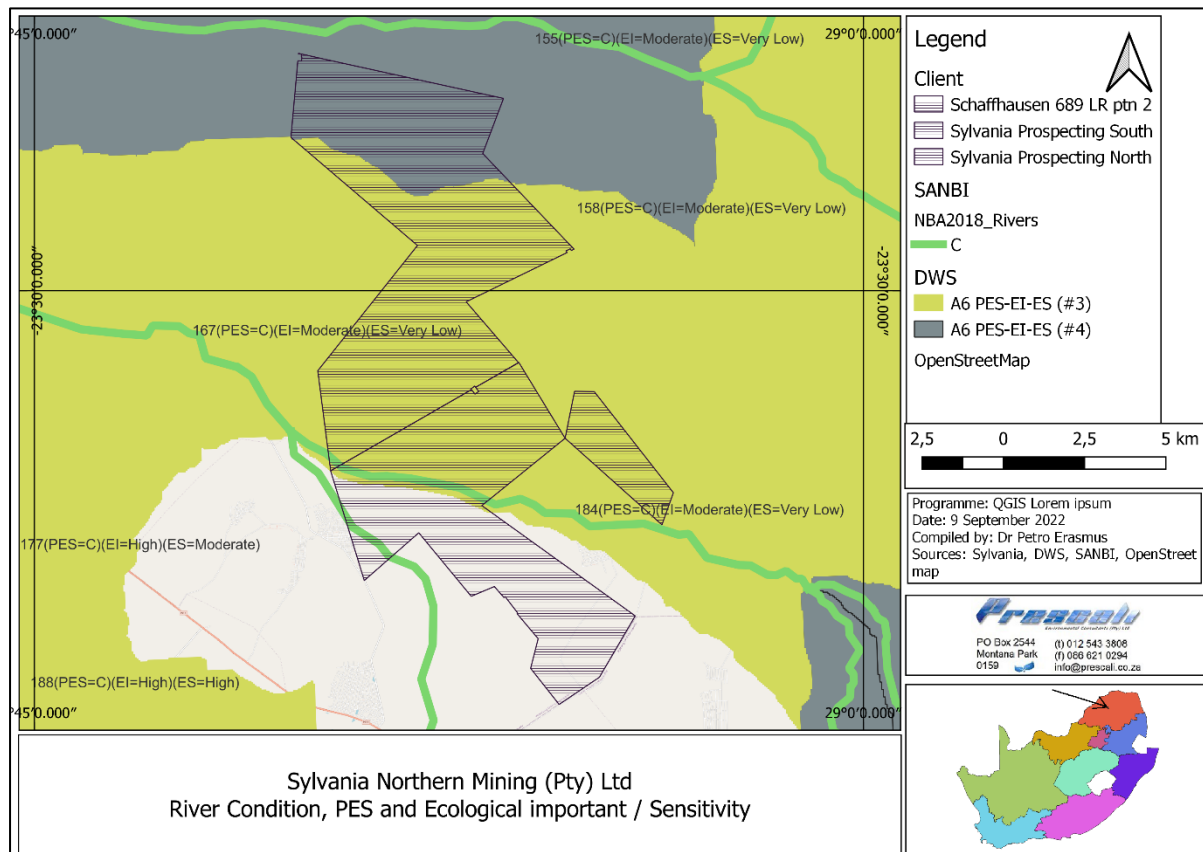
No biomonitoring was conducted for this report; from the Freshwater Biodiversity Organisation website one sampling result date was available for the Matlala River (below Debengeni falls: A6N0KA-00001) and fish species were recorded<sup>23</sup>:

<sup>22</sup> <http://www.dwa.gov.za/iwqs/rhp/eco/peseismodel.aspx> 9 September 2020

<sup>23</sup> <https://freshwaterbiodiversity.org/map/#site-detail/taxon=&search=MATLALA&siteId=30447&collector=&category=&yearFrom=&yearTo=&months=&boundary=&userBoundary=&referenceCategory=&spatialFilter=&>



Taxon	Occurrences	Origin	Endemism	Cons. Status (Global)
<i>Amphilius natalensis</i> Boulenger, 1917	1	Native	Widespread	Least concern
<i>Amphilius uranoscopus</i> (Pfeffer, 1889)	1	Native	Subregional endemic	Least concern



**Figure 10-15: River condition, Present Ecological Status, Ecological Importance and Sensitivity**

The quaternary catchments have a NFEPA code 0 classification: Not classified.

- It does not fall within a fish sanctuary area for threatened species;
- It does not fall within a fish relocation area for threatened species;
- It does not fall within a fish translocation area for threatened species;
- It does not fall within a fish rehabilitation area for threatened species; and
- It does not fall within a fish Corridor area for threatened species.

#### 10.6.4 Background Water Quality

The DHSWS has monitoring points in the Mogalakwena Rivers and the average concentrations are provided in Table 10-5:

- WMS A62\_1000004250 (1-4250): Uitzicht Verstoorteling 670 LR Bridge on Mogalakwena River 0.6 km Before Confluence with Matlalanane (2009-01-22 to 2009-02-25); and
- WMS A62\_90366: Glen Alpine Dam on Mogalakwena River: near Dam Wa (ncwq NEMP) (1975-11-12 to 2018-05-14) downstream of the confluence with the Seepabana River.

**Table 10-5: Average background surface water quality (DWAf, 1996) (DWAf, 1996) (DWAf, 1996) (DWAf, 1996)**

Parameter		A62-90366 <sup>24</sup>	A62-100004250 <sup>25</sup>	Aquatic	Domestic	Agriculture	
						Livestock	Irrigation
Alkalinity	mg CaCO <sub>3</sub> /l)	87,185	1221	N/A	N/A	N/A	N/A
Aluminium	mg/l	0,07	0,05	< 0.005	< 0.015	<5	<5
Calcium	mg Ca/l	20,069	22	N/A	< 32	< 1000	N/A
Chlorine (free)	mg/l	48,79	ND	N/A	N/A	N/A	N/A
Electrical conductivity	mS/m	35,928	1059,5	15% from normal	< 70	156 (Dairy Pigs and Poultry), 313 Cattle & Horses, 469 (Sheep)	6,25
Fluoride	mg/l	0,328	1,1	< 0.75	< 1	< 2 All other livestock; < 6 ruminants	< 2
Magnesium	mg/l	9,674	90	N/A	< 30	< 500	N/A
pH	pH units	7,917	8,85	5% from normal	6 - 9	N/A	6.5 - 8.4
Phosphorus (inorganic)	mg/l	0,084	ND	0,005	N/A	N/A	N/A
Potassium	mg/l	3,578	53,5	N/A	< 50	N/A	N/A
Silica	mg/l	5,405		N/A	N/A	N/A	N/A
Sodium	mg/l	34,221	2140	N/A	< 100	< 2000	< 70
Sulphate	mg/l	8,299	510	N/A	< 200	< 1000	N/A

<sup>24</sup> [www.dwa.gov.za/iwqs/wms/data/A62/A62\\_90366.zip](http://www.dwa.gov.za/iwqs/wms/data/A62/A62_90366.zip) 9 September 2022

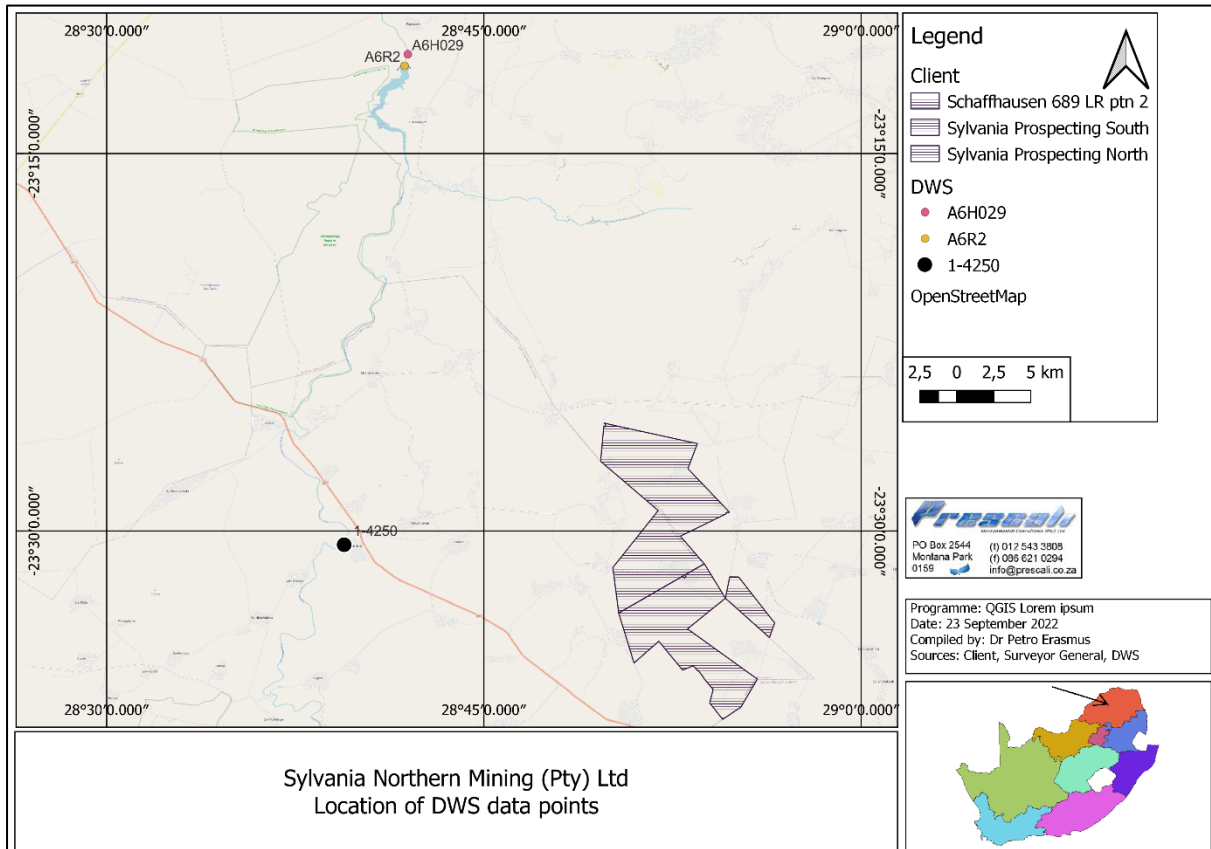
<sup>25</sup> [www.dwa.gov.za/iwqs/wms/data/A62/A62\\_100004250.zip](http://www.dwa.gov.za/iwqs/wms/data/A62/A62_100004250.zip) 9 September 2022

The water quality at the Glen Alpine Dam is of good quality complying with the Water Quality Guidelines except for Aluminium and for Phosphorus (inorganic). The upstream site indicates very poor water quality but only two samples' results were available, it may be that the samples were taken from stagnant water which could affect the quality thereof.

### 10.6.5 Surface Water Quantity

#### 10.6.5.1 Mean Annual Runoff

The MAR is indicated in Table 10-3.



**Figure 10-16: Location of DWS data sites in relation to the Sylvania Northern Mining (Pty) Ltd Investments' Prospecting Right area**

#### 10.6.5.2 Flow

No flow data is available for the Matlala and Seepabana Rivers. Monthly flow data in the Mogalakwena River was provided by DWS<sup>26</sup> for site A6H029 Glen Alpine dam from 1 May 1975 till 28 February 2022 and is indicated in Figure 10-17 per month and in Figure 10-18 (Annual).

<sup>26</sup> Email correspondence dated 9 September 2022 from Nhlapo Elias

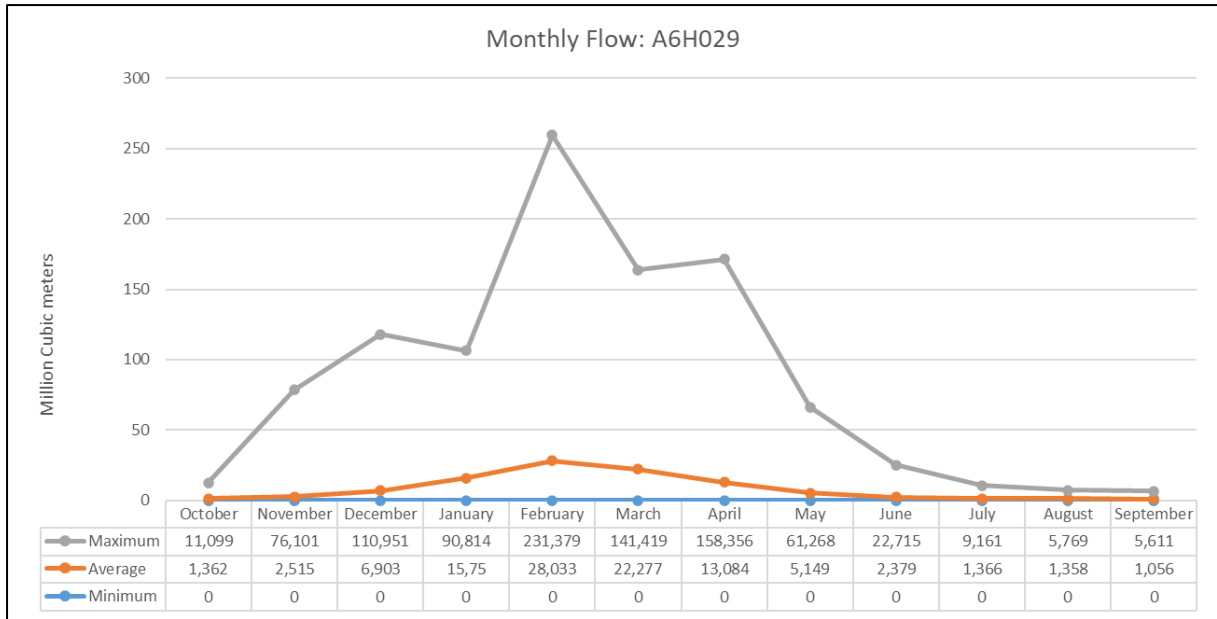


Figure 10-17: Mogalakwena River Monthly flow volume (million cubic meters)

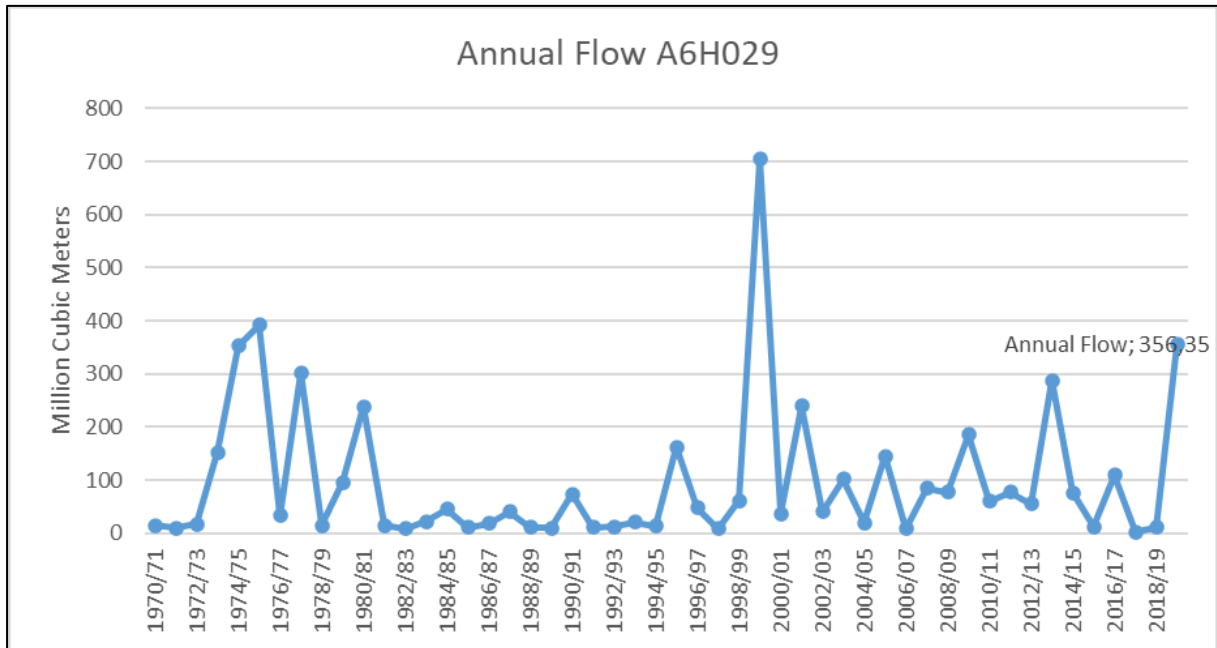
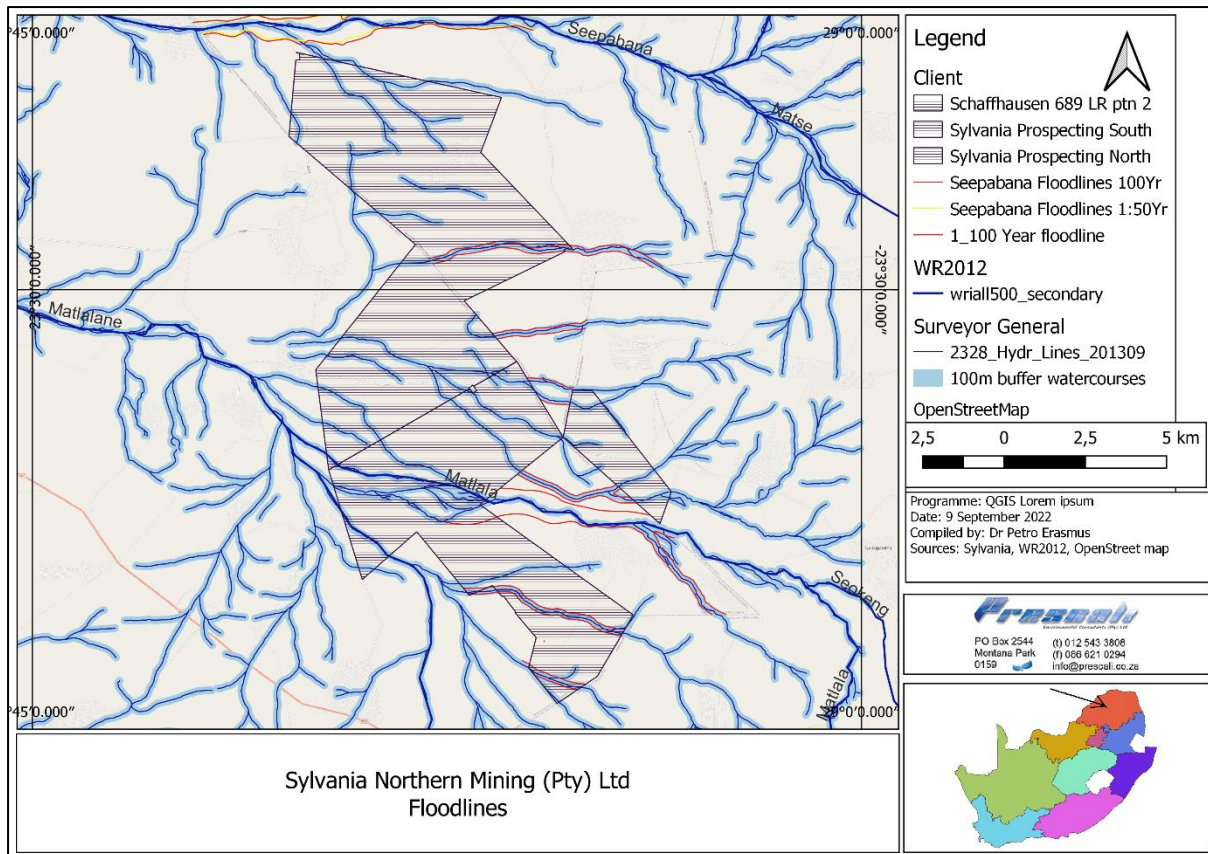


Figure 10-18: Total Annual flow in the Mogalakwena River (million cubic meters)

### 10.6.6 Flood Lines

Flood lines were sourced from assessment done for other Prospecting Right applications in the area, these include the Seepabana (Element Consulting Engineers, 2014) and Matlala Rivers (Element Consulting Engineers, 2014) and are indicated below.



**Figure 10-19: Flood lines**

From the flood line report conducted for the Matlala River it is noted that in general the catchments of the tributaries are so small that the 100 m buffer is sufficient to encompass the 1 in 100-year flood line.

### 10.6.7 Site specific Aquatic Ecosystem Descriptions

#### 10.6.7.1 Aquatic Ecosystem Types

Aquatic ecosystems can be classified into two types namely:

- Lentic Ecosystems: and
- Lotic Ecosystems.

#### 10.6.7.2 Lentic Ecosystems – Wetlands, Impoundments, Lakes

Lentic ecosystems refer to standing or basin ecosystems and include lakes, impoundments and wetlands<sup>27</sup>.

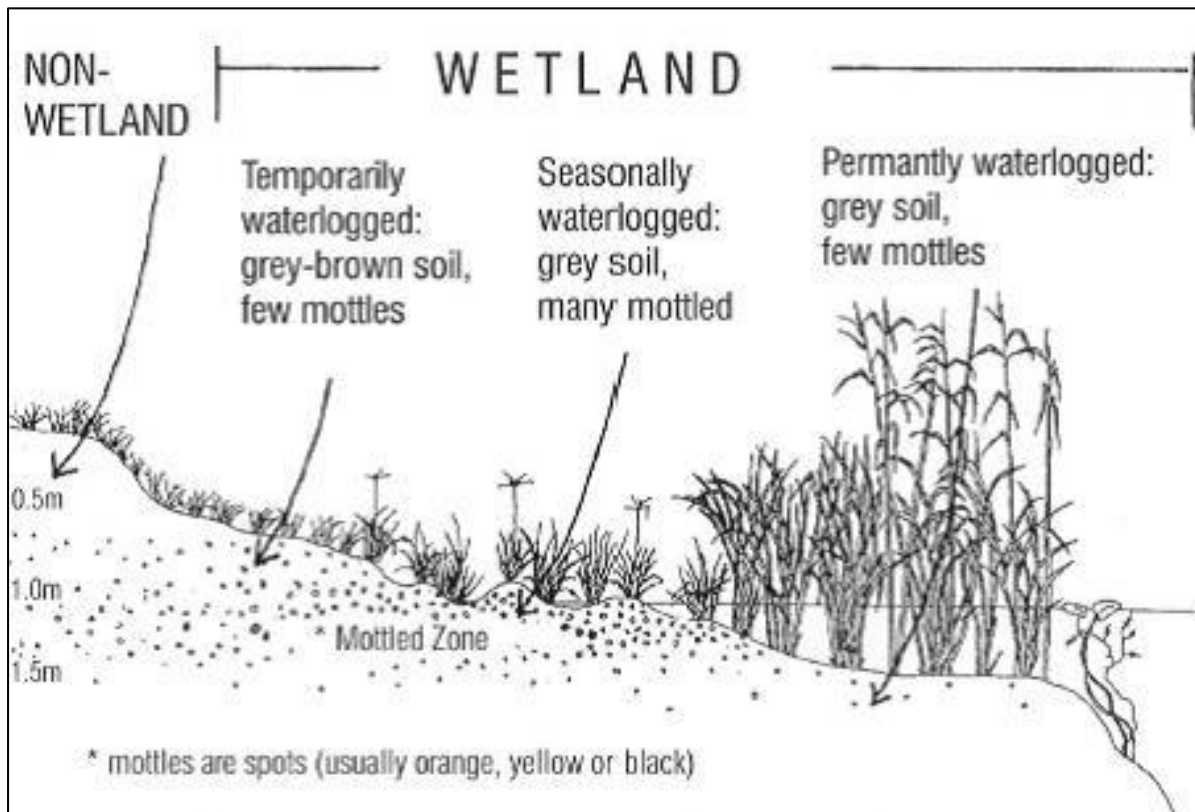
- Lakes: Generally, lakes are formed in basins created by geological activities e.g. warping and faulting of the earth's crust or as a result of glacial activities<sup>27</sup>. There are no lakes at the Sylvania Northern Mining (Pty) Ltd Prospecting Right area.
- Impoundments, or dams are manmade infrastructures and can be on-stem (i.e., the watercourse itself is dammed) or off-stem (i.e., the dam is located a distance from the watercourse and water is pumped from the watercourse / underground reservoir to the dam)<sup>27</sup>. There are no major dams in the Mogalakwena River catchment (DWS, 2004) and the Glen Alpine Dam that was constructed mainly for irrigation purposes are located on the Mogalakwena River.

<sup>27</sup> <http://www.egyankosh.ac.in/bitstream/123456789/16255/1/Unit-8.pdf> 18 August 2020

- Wetlands: A wetland as defined by the NWA means “land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil”. As described by (DWAF, 2005) the word “wetland” refers to ecosystems of which the primary driving force is water. Its prolonged presence in wetlands is a fundamental determinant of soil characteristics and plant and animal species composition. Any part of the landscape where water accumulates for long enough and often enough to influence the plants, animals and soils occurring in that area, is thus a wetland. The objective of the delineation procedure is to identify the outer edge of the temporary zone. This outer edge marks the boundary between the wetland and adjacent terrestrial areas.

Wetlands must have one or more of the following indicators:

- Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation;
- The presence, at least occasionally, of water loving plants (hydrophytes);
- A high-water table that results in saturation at or near the surface, leading to anaerobic conditions developing in the top 50 cm of the soil; and
- Terrain Unit indicator to identify the locality of the wetland within the landscape.



**Figure 10-20: Cross section through a wetland (DWAF, 2005)**

From the 2018 National Wetland Map 5 Ecosystem threat status and protection level data map (CSIR, 2018) several natural wetlands were identified at the Sylvania Northern Mining (Pty) Ltd Prospecting Right area (not visually confirmed using Google Earth™), refer to Figure 10-14.

#### 10.6.7.3 Lotic ecosystems – Rivers, streams etc.

Lotic systems include rivers and the most outstanding feature of such habitats are flowing water which moulds the characteristics of the water bed and influences the distribution of the organisms therein<sup>27</sup>.

A water course is defined by the NWA as:

- River or spring;
- A natural channel in which water flows regularly, or intermittently;
- A wetland, lake or dam into which, or from which water flows (refer to Section 10.6.7.2); and
- Any collection of water that the Minister may, by notice in the Gazette, declare to be a water course, and a reference to a watercourse includes where relevant, its bed and banks.

For the purpose of this assessment, the applicable river / watercourse reaches were classified according to the guidelines by DWS in "A practical field procedure for identification and delineation of wetlands and riparian areas" as shown in Figure 10-21. Using this classification, three sections along the length of a watercourse are defined based on their position relative to the zone of saturation in the riparian area:

- Section "A" is defined as being above the zone of saturation and it therefore does not carry baseflow. They are mostly too steep to be associated with alluvial deposits and are not flooded with sufficient frequency to support riparian habitat or wetlands. This type does however carry storm runoff during fairly extreme rainfall events, but the flow is of short duration, in the absence of baseflow. The "A" watercourse sections are the least sensitive watercourses in terms of impacts on water yield from the catchment.
- Section B reaches are in the zone of the fluctuating water table, baseflow is intermittent and dependant on the current height of the water table and as the channel bed is in contact with or in close proximity to the water table residual pools are often observed when flow cease. The top end of the B Section is marked by the most headward extent of base flow in the channel during wet periods, when the water table is high, and the bottom end of the B Section is marked by the most downstream extent of zero flow during dry periods (when the water table is low). With regards to slope, the channel bed is flat enough to allow for the deposition of material and initial signs of flood plain development may be observed.
- Section C streams are perennial streams and thus always have contact with the zone of saturation (except during extreme drought conditions). These sections are very flat and a flood plain is usually present.

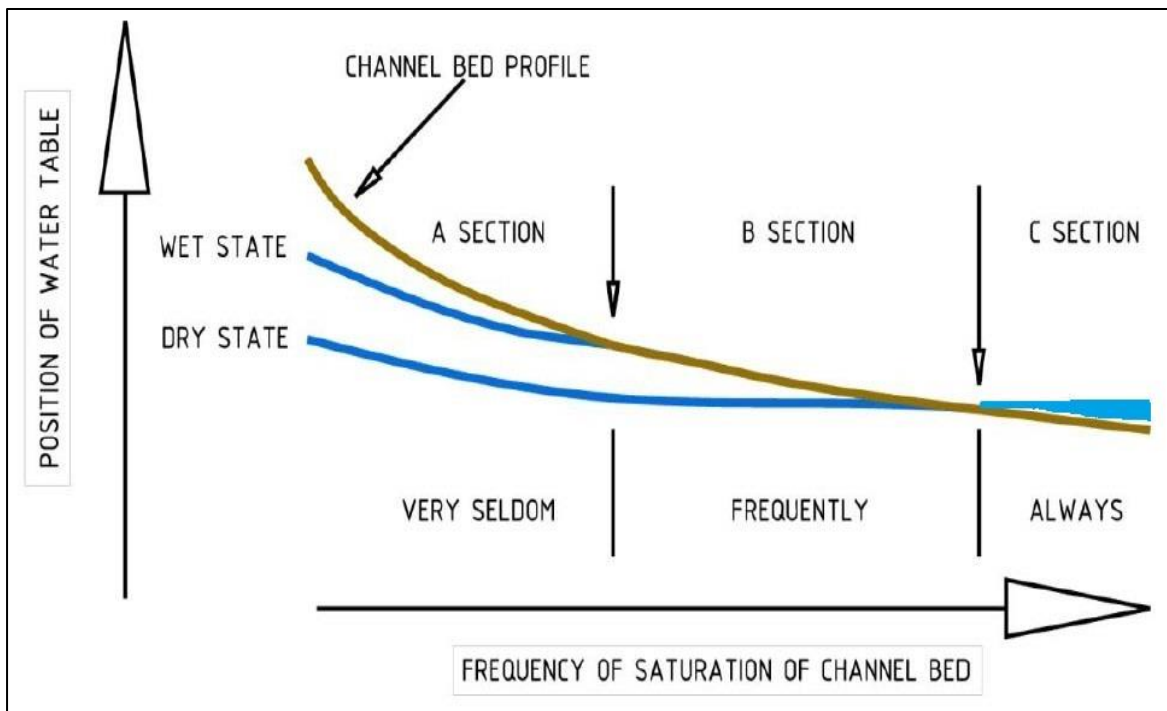


Figure 10-21: River Classification (DWAf, 2005)



The Matlala River crosses the Sylvania Northern Mining (Pty) Ltd Prospecting Right application area (Figure 10-14) and are preliminary classified as Section B watercourse, while the Seepabana directly to the north is classified as Section C due its classification as Perennial.

## 10.7 GROUNDWATER

Information in this section was sourced from GPT (2015).

Potentially two types of aquifers may occur across the prospecting application area (GPT, 2015)., these are:

- Shallow saprolitic aquifer: *“The main source of recharge into the shallow aquifer is rainfall that infiltrates the aquifer through the unsaturated (vadose) zone. Vertical movement of water is faster than lateral movement in this system as water moves predominantly under the influence of gravity. The shallow regolith aquifer consists of between 9 and 36 m of weathered bedrock in the Polokwane area. The upper portion of this aquifer is generally fractured and has a high porosity and low permeability. The alluvial aquifers occur along drainage courses and form an intergranular aquifer which usually consists of red sandy clay (that is calcified in places) overlying sand, gravel and pebbles”*; and
- Deeper fractures aquifers: *“The host geology of the area consists of mafic and acidic rocks of the Bushveld Igneous Complex, the Paleoproterozoic rocks of the Hout River Gneiss and the consolidated sandstones of the Waterberg Group. Most of the groundwater flow will be along the fracture zones that occur in the relatively competent host rock. The geology map does not indicate any major fractures zones in this area, but from experience it can be assumed that numerous major and minor fractures do exist in the host rock. These conductive zones effectively interconnect the strata of the bedrock, both vertically and horizontally into a single, but highly heterogeneous and anisotropic unit. 52 percent of boreholes in these aquifer systems have yields of 0.1l/s. Groundwater quality in the area is also expected to be intermediate to poor with EC values ranging from 4.4 to 120 mS/m and possibly elevated Ca, Mg, Cl, and SO<sub>4</sub> as well as carbonate alkalinity concentrations ([http://www.dwaf.gov.za/iwqs/wms/data/WMS\\_WMA\\_txt](http://www.dwaf.gov.za/iwqs/wms/data/WMS_WMA_txt) - as cited by GPT, 2015).”* *“Both the porosity (ratio of the volume of void space to the total volume of the rock or earth material) and the hydraulic conductivity (Measure of the ease with which water will pass through the earth's material; defined as the rate of flow through a cross-section of one square metre under a unit hydraulic gradient at right angles to the direction of flow (m/d)) of the Rustenburg Layered Suite fractured aquifers are known to be low. The commonly expected values of porosity and permeability for igneous rock types, similar to those present in the Rustenburg Layered Suite, are 0.05 (porosity) and 10-5 m.d<sup>-1</sup> (hydraulic conductivity) respectively (Kruseman & de Ridder, 1994 as cited by GPT, 2015). Movement of groundwater in this aquifer will be preferential in secondary structures such as joints, faults and fractures.”*

An outline of boreholes identified by GPT (2015) and their location is provided in Figure 10-22 and Table 10-6. However as this was done on only a portion of the application area it is believed that there will be many more boreholes applicable.

The GPT (2015) report concluded the following with regards to groundwater quality (





Table 10-7):

- The major cations in the groundwater samples are sodium and calcium
- The major anions in the groundwater samples are chloride and bi-carbonate with the exception of PAN-LEK1 at which nitrate is an additional major anion
- The groundwater quality of most samples can be described as unpolluted sodium chloride or sodium bicarbonate waters while PAN-MOS4, PAN-MOS2, PAN-ALT1, PAN-ATL2 and PAN-LEK1 can be described as calcium chloride waters.

**Table 10-6: Hydrocensus boreholes (GPT, 2015)**

ID	Latitude	Longitude	Elevation	Owner	Property	Static water level (mbgl)	Static water level (mamsl)	Sampled (Y/N)	Use	Comments
<b>Groundwater</b>										
NW18	-23.463	28.88553	993.37	Pan Palladium	Kransplaats 422LR	-	-	No	Not in use	Blocked at 4 m; No casing
NW14	-23.4629	28.88538	993.34	Pan Palladium	Kransplaats 422LR	-	-	No	Not in use	Backfilled with sand
NW12	-23.4629	28.88509	992.94	Pan Palladium	Kransplaats 422LR	-	-	No	Not in use	Blocked at 12 m; No casing
NONO17RC-A	-23.4628	28.8835	997	Pan Palladium	Kransplaats 422LR	Dry	-	No	Not in use	Dry at 17 m
NONO17RC-B	-23.4628	28.8835	995	Pan Palladium	Kransplaats 422LR	Dry	-	No	Not in use	Dry at 23 m
NW01	-23.47186	28.88727	995	Pan Palladium	Nonnenwerth 421LR	22	973	Yes	Not in use	Black viscous water sampled; No casing
NW02	-23.4719	28.88673	994.1	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 8 m
NW05	-23.4809	28.88982	993.37	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Backfilled with sand
NW03	-23.4809	28.88673	992.1	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 8 m
PAN-MOS1	-23.49607	28.91469	1027	J. H. Mothiba	Mosehleng	-	-	Yes	Livestock	Windmill. Pumping at low wind speed
PAN-MOS2	-23.49012	28.91637	1034	Provincial Government	Mosehleng	-	-	Yes	Domestic	School with a hundred learners and staff
PAN-MOS3	-23.49018	28.91595	1028	Provincial Government	Mosehleng	-	-	Yes	Domestic	Pumps to the same eight tanks as PAN-MOS2
PAN-MOS4	-23.48495	28.92015	1027	Blouberg Municipality	Mosehleng	-	-	Yes	Domestic	Supplies three villages; Constantly pumping
PAN-MOS5	-23.48764	28.90943	1015	Provincial Government	Mosehleng	13.818	1001.182	Yes	Not in use	Recently drilled
H04-R1400	-23.48607	28.91666	1024	Provincial Government	Mosehleng	-	-	Yes	Domestic	Mesehleng Clinic with nine staff members
H04-R1400-1	-23.48621	28.91668	1024	Provincial Government	Mosehleng	-	-	Yes	Domestic	Composite sample with H04-R1400
NW26	-23.49431	28.89144	995	Pan Palladium	Nonnenwerth 421LR	22	973	Yes	Not in use	Black viscous water sampled
NW27	-23.49432	28.89101	995	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 1.5 m
NW06	-23.489792	28.890718	992.7	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 19 m
NW11	-23.5169	28.89573	992.84	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 1.1 m
NW13	-23.5168	28.89469	991.65	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 18 m
NW15	-23.5171	28.89488	992.05	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 20 m
NW17	-23.5169	28.89477	991.89	Pan Palladium	Nonnenwerth 421LR	-	-	No	Not in use	Blocked at 20 m
PAN-ALT1	-23.6119	28.88917	998	S. Ramagosha	Altona 696LR	20.6	977.4	Yes	Livestock and domestic	In use since 2010
PAN-ALT2	-23.6117	28.8891	996	S. Ramagosha	Altona 696LR	-	-	Yes	Domestic	Occupants renting
PAN-ALT3	-23.62589	28.88212	1005	S. Ramagosha	Altona 696LR	Dry	-	No	Not in use	Dry at 100 m
LP06	-23.574	28.89836	999.74	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Backfilled with sand
LP05	-23.5741	28.89847	999.57	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Blocked at 6 m
LP04	-23.574	28.89817	999	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Blocked at 24 m
LP07	-23.565	28.89871	1002	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Blocked at 25 m

ID	Latitude	Longitude	Elevation	Owner	Property	Static water level (mbgl)	Static water level (mamsl)	Sampled (Y/N)	Use	Comments
LP08	-23.565	28.89861	1002	Pan Palladium	La Pucella 693LR	24	978	Yes	Not in use	Bail test performed
LP09	-23.565	28.89868	1002	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Blocked at 6 m
LP10	-23.5655	28.89858	1002	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Blocked at 22.5 m
LP11	-23.5655	28.89873	1002	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Backfilled with sand
LP12	-23.5655	28.89871	1002	Pan Palladium	La Pucella 693LR	-	-	No	Not in use	Blocked at 8 m
PAN-LEK1	-23.57637	28.92247	1032	Provincial Government	Lekhureng	-	-	Yes	Domestic	Poor yield; Dry between August and September
PAN-LEK2	-23.57688	28.92247	1031	Provincial Government	Lekhureng	-	-	Yes	Domestic	Composite sample with PAN-LEK3
PAN-LEK3	-23.57127	28.92072	1017	Provincial Government	Lekhureng	-	-	Yes	Domestic	Purification system on site
H04-2141	-23.57127	28.92072	1017	Provincial Government	Lekhureng	-	-	Yes	Domestic	Composite sample with PAN-LEK3
H04-1499	-23.53159	28.8782	987	Blouberg Municipality	Ga-Ramella	-	-	Yes	Livestock and domestic	Very poor yield
H03-R0111	-23.53156	28.87882	985	Blouberg Municipality	Ga-Ramella	Dry	-	No	Not in use	Dry at 15 m; Pump stolen
PAN-GAR1	-23.53465	28.88235	987	Amaloba Horticulture	Ga-Ramella	-	-	Yes	Irrigation and domestic	Use discontinued due to poor yield
H04-08883	-23.51623	28.93717	1056	Provincial Government	Ngwanallela	8.3	1047.7	Yes	Domestic	Use discontinued due to poor yield
H04-2067	-23.5166	28.93722	1055	Provincial Government	Ngwanallela	-	-	Yes	Irrigation and domestic	100 square meter yard
PAN-NGW1	-23.51766	28.9358	1057	R. Rampedi	Ngwanallela	7.5	1049.5	No	Not in use	Not enough water to sample; Use discontinued
<b>Average</b>						<b>16.89</b>	<b>999.97</b>			
<b>Surface water</b>										
PAN-MATLALA1	-23.57176	28.93944	1024	Unknown	La Pucella 693LR			Yes	Livestock	Upstream sample
PAN-MATLALA2	-23.52418	28.81264	946	Unknown	Teneriffe 683LR			Yes	Livestock	Downstream sample

**Table 10-7: Water quality data (GPT, 2015)**

Water Quality Constituents		NW01	PAN-MOS2	PAN-MOS4	PAN-MOS5	NW26	PAN-MATLALA 1	LP08	PAN-LEK12	PAN-LEK3	PAN-ALT1	PAN-ALT2	PAN-MATLALA 2	H04-1499	PAN-GAR1	H04-08883	TWQR	Tolerable	Exceeding TWQR
Total Alkalinity	M Alk. [mg/l CaCO <sub>3</sub> ]	951.00	170.00	419.00	442.00	140.00	0.00	558.00	255.00	448.00	351.00	353.00	102.00	500.00	472.00	212.00	Not available		
Aluminium	Al [mg/l]	11.80	0.00	0.00	0.00	0.00	14.90	0.06	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0 - 0.15	0.15 - 0.5	> 0.5
Calcium	Ca [mg/l]	231.00	292.00	87.10	107.00	1.44	7.85	53.20	246.00	84.40	212.00	214.00	14.50	49.10	46.40	50.00	0 - 32	32 - 80	> 80
Chloride	Cl [mg/l]	347.00	1480.00	362.00	475.00	460.00	35.10	239.00	651.00	240.00	816.00	831.00	18.70	234.00	217.00	361.00	0 - 100	100 - 600	> 600
Chromium	Cr <sup>6+</sup> [mg/l]	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 - 0.050		> 0.050
Electrical Conductivity	EC [mS/m]	196.00	441.00	184.00	217.00	31.50		167.00	325.00	168.00	307.00	309.00	24.10	169.00	160.00	190.00	Not available		
Fluoride	F [mg/l]	0.00	0.00	0.00	0.00	0.20	0.66	0.00	0.00	1.22	0.00	0.00	0.36	0.00	0.00	0.00	0 - 1.0	1.0 - 1.5	> 1.5
Iron	Total Fe [mg/l]	48.70	0.06	0.00	0.00	0.00	6.89	0.32	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0 - 0.1	0.1 - 1.0	> 1.0
Magnesium	Mg [mg/l]	152.00	128.00	85.40	84.30	0.81	5.87	41.20	152.00	66.70	102.00	102.00	4.71	59.90	55.00	53.50	0 - 30	30 - 70	> 70
Manganese	Mn [mg/l]	11.90	0.30	0.00	0.33	0.00	0.17	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0 - 0.05	0.05 - 1.0	> 1.0
Nitrate	NO <sub>3</sub> as N [mg/l]	0.00	0.00	12.80	0.00	32.20	0.50	0.00	113.00	30.50	0.00	0.00	0.00	0.00	0.00	0.00	0 - 6		> 6
pH	pH units	6.61	7.29	7.95	7.53	8.43	7.20	7.92	7.24	7.93	7.54	7.52	7.72	7.79	7.84	7.38	6.0 - 9.0		<6, >9
Potassium	K [mg/l]	15.10	9.01	18.60	18.70	1.13	5.76	12.40	99.80	13.30	11.30	11.70	8.68	16.50	16.80	15.90	0 - 50	50 - 100	> 100
Sodium	Na [mg/l]	269.00	501.00	208.00	262.00	8.52	79.60	304.00	168.00	222.00	331.00	329.00	31.10	263.00	252.00	298.00	0 - 100	100 - 200	> 200
Sulphate	SO <sub>4</sub> [mg/l]	40.80	147.00	50.10	94.90	173.00	11.30	72.60	141.00	58.40	142.00	148.00	8.65	62.30	54.10	163.00	0 - 200	200 - 400	> 400
Total Dissolved Solids	TDS [mg/l]	1370.00	3080.00	1290.00	1519.00	221.00	No EC value	1170.00	2270.00	1180.00	2148.30	2170.00	168.70	1183.00	1119.30	1332.10	0 - 450	450 - 1 000	> 1000
Zinc	Zn [mg/l]	0.90	0.05	0.09	0.00	0.15	0.00	0.00	0.00	1.03	2.40	0.79	0.00	0.21	0.00	0.05	0 - 3	3 - 10	> 10
Cation/Anion Balance %		10.80	-3.64	-1.20	-0.05	-95.00	14.00	-2.30	-3.40	-2.27	1.07	-1.72	-1.29	-0.19	0.18	0.47	Error should not exceed 5%		
Notes: A value of zero indicates that the analysis was below the detection limit																			
TWQR- Target water quality range																			
Tolerable - Suitable for short-term intake, in some instances health problems can occur during extensive long-term intake in sensitive individuals such as infants																			
Exceeding TWQR- Exceedance of target water quality range may lead to adverse affects																			

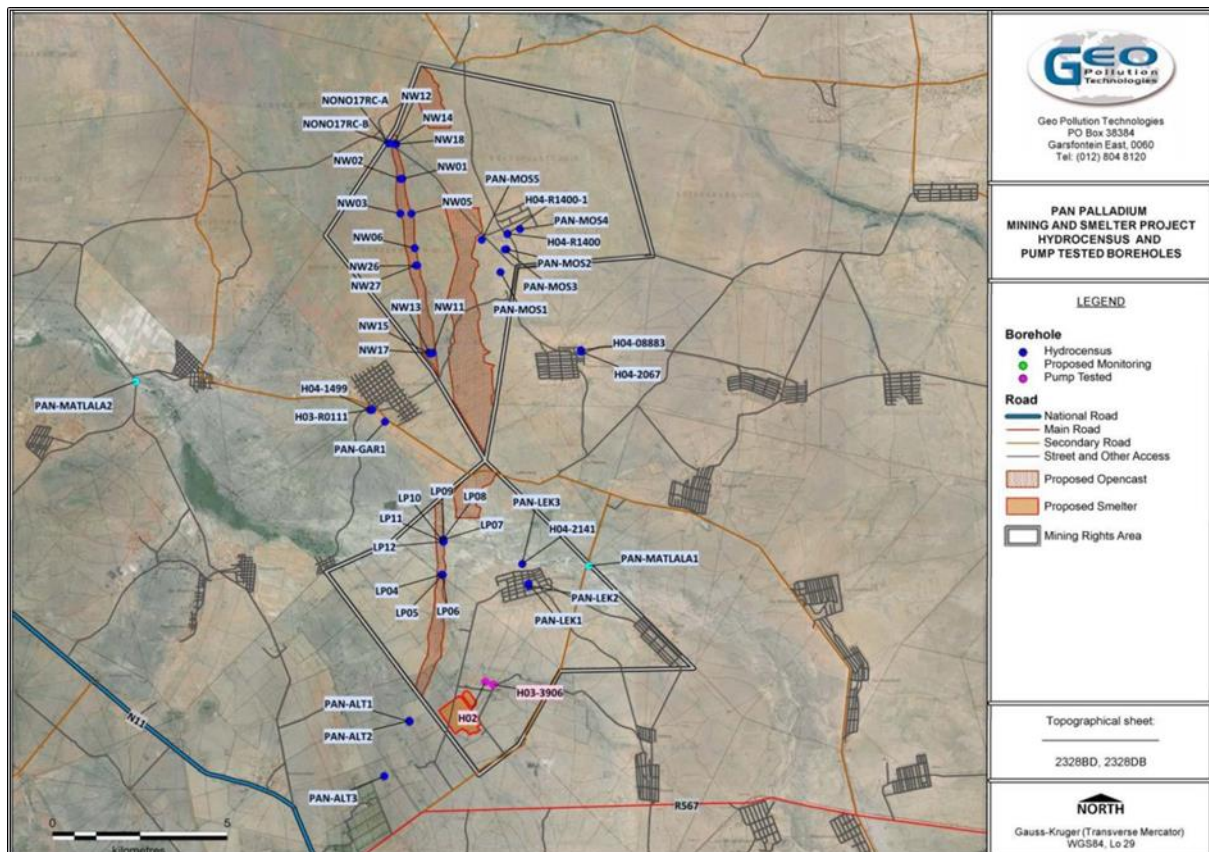


Figure 10-22: Location of hydrocensus boreholes (GPT, 2015)

## 10.8 AIR QUALITY

Given the rural nature of the area, current levels of particulate matter (PM) in the atmosphere are expected to be low. Existing land uses such as agriculture contribute to baseline pollutant concentrations via the following sources:

- Unpaved and paved roads: Emissions from unpaved roads constitute a major source of emissions to the atmosphere in the South African context. Dust emissions from unpaved roads vary in relation to the vehicle traffic and the silt loading on the roads. Emission from paved roads is significantly less than those originating from unpaved roads, however they do contribute to the particulate load of the atmosphere. Particulate emissions occur whenever vehicles travel over a paved surface. The fugitive dust emissions are due to the re-suspension of loose material on the road surface.
- Wind erosion and open areas: Windblown dust generates from natural and anthropogenic sources. Erodible surfaces may occur as a result of agriculture and/or grazing activities.
- Vehicle tailpipe emissions: Emissions resulting from motor vehicles can be grouped into primary and secondary pollutants. While primary pollutants are emitted directly into the atmosphere, secondary pollutants form in the atmosphere as a result of chemical reactions. Significant primary pollutants emitted combustion engines include carbon dioxide (CO<sub>2</sub>), carbon (C), sulphur dioxide (SO<sub>2</sub>), oxides of nitrogen (mainly NO), particulates and lead. Secondary pollutants include NO<sub>2</sub>, photochemical oxidants such as ozone, sulphur acid, sulphates, nitric acid, and nitrate aerosols (particulate matter).

Realtime air quality data<sup>28</sup> for Mokopane (approximately 70 km south of the application area indicate that the air quality is considered to be Good.

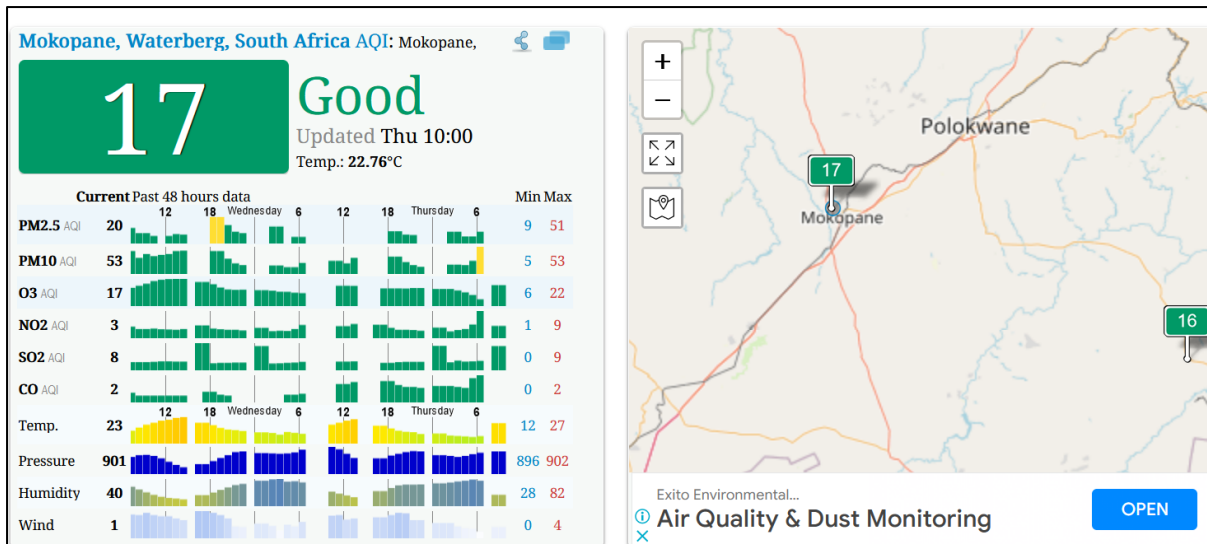


Figure 10-23: Air Quality in Mokopane<sup>28</sup>

### 10.9 NOISE LEVELS

Background noise levels will be informed by the roads and the residential areas within and surrounding the prospecting application area. Based on previous assessments done near the prospecting area it is believed that the area will have a sound level character typical of a sub-urban noise district in terms of the SANS 10103:2008 rating levels (EARES, 2013).

### 10.10 HERITAGE AND CULTURAL RESOURCES

A desktop assessment was conducted by Mr Anton Pelser in 2022 based on field work conducted in 2013 and 2014. From the report the following is noted:

- No Stone Age sites (including rock art) are known to occur in the immediate study area. The closest known Stone Age sites are located at near Blouberg on the Makgabeng Plateau dating to the Later Stone Age (Bergh 1999: 4 as cited by A. Pelser). A very large number of significant rock art sites (numbering in their hundreds) are located on the Makgabeng Plateau and on farms directly north of the study area. These rock art sites are representative of San, Khoi and Northern-Sotho rock art traditions (J.van Schalkwyk Pers.Comm 2012-12-11 as cited by A. Pelser) and is located on farms such Disseldorp 369LR and Bayswater 370LR north of the farms that form part of the current study (Eastwood et.al 2004; 2005 as cited by A. Pelser), as well as other farms including Groenepunt, Kirstenspruit and Rosamond.]
- There are no known Iron Age sites in the immediate study area. A large number of Early Iron Age and Late Iron Age sites are known to exist to the north of the study area on the Makgabeng Plateau (J.van Schalkwyk Pers.Comm. 2013-10-15 as cited by A. Pelser). Tom Huffman's research work shows that Early Iron Age, Middle Iron Age and Late Iron Age sites, features or material could possibly be found in the area. This could include the so-called Happy Rest facies of the Kalundu Tradition dating to between AD500 and AD750 (Huffman 2007: 219); Diamant facies of the same tradition dating to between AD750 and AD1000 (p.223); Eiland facies of Kalundu dating to between AD1000 and AD1300 (p.227); the Icon facies of the Urewe Tradition dating to between AD1300 & AD1500 (p.183) and finally the Letsibogo facies of the same tradition dating to between AD1500 and AD1700 (Huffman 2007: 187 as cited by A. Pelser).
- The historical age started with the first recorded oral histories in the area. It includes the moving into the area of people that were able to read and write. The first European group to pass close

<sup>28</sup> <https://aqicn.org/city/south-africa/waterberg-dm/mokopane/> 15 September 2022

by the area was that of Coenraad de Buys in 1821 and again 1825, followed by the Voortrekkers after 1844 (Bergh 1999: 12; 14). By 1848 the area formed part of the Soutpansberg Magisterial District (Bergh 1999: 17 as cited by A. Pelsler).

During previous assessments in the area by the author of this report (2013 and 2014) some cultural heritage sites and features were identified. These included mainly recent historical settlement remains as well as graveyards and graves. No Stone Age or Iron Age sites or remains were identified during these previous field assessments. The location of sites found are indicated below:

- Sites 1 and 2 are ruins of recent historical settlement;
- Sites 3 & 4 – Sections of low, stone-packed walls dating to recent historical periods (Low Cultural Heritage Significance);
- Sites 5, 6 and 7 are graveyards / cemeteries (High Cultural Significance);

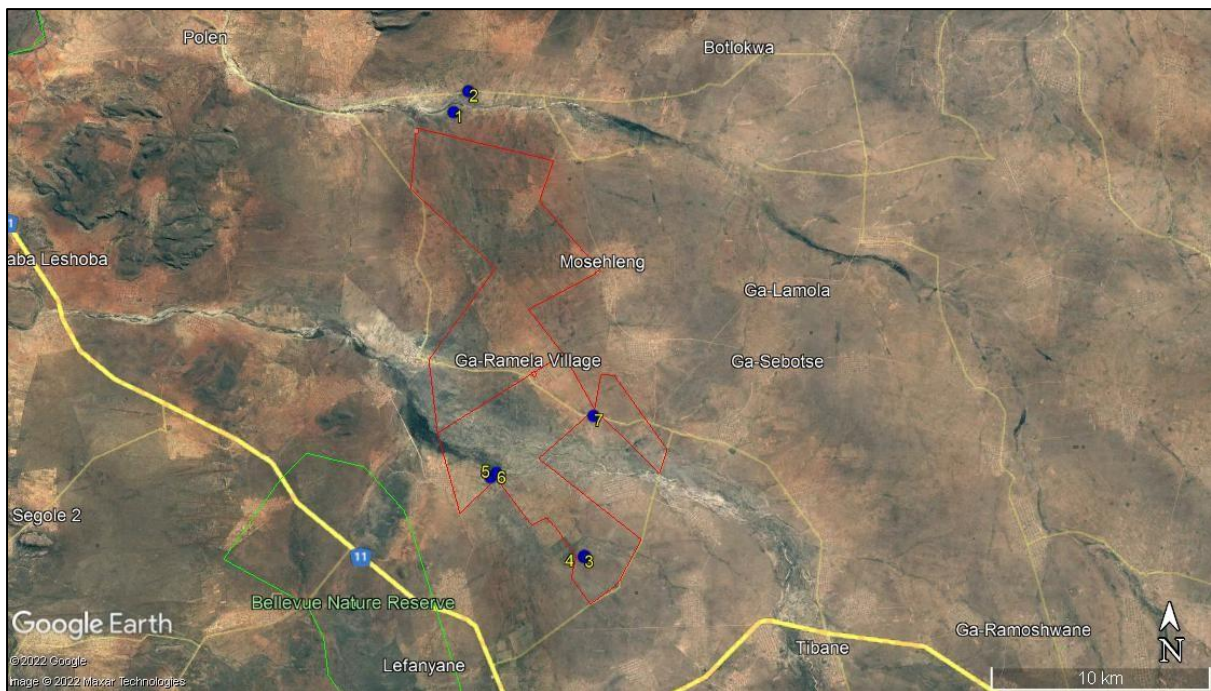


Figure 10-24: Location of historical sites identified during previous assessments

## 10.11 SOIL, LAND USE AND LAND CAPABILITY

### 10.11.1 Land types and Soil Series

The proposed prospecting application area traverses through Four (4) land types:

- Land Type Ae334: This land type has three (3) different terrain positions and the underlying geology is described as Sand of the Quaternary System. It covers an area of 58 413 Ha of which approximately 8 000 ha is unavailable for agriculture. Soil series and the depth present are:
  - Rock
  - Zwartfontein Hu34, Portsmouth Hu35: > 1200 mm
  - Portsmouth Hu35, Zwartfontein Hu34: 400-600 mm
  - Shorrockes Hu36, Blinkklip Cv36: 600-900 mm
  - Platt Gs14, Glenrosa Gs15, Mispah Ms10: 300 – 400 mm
  - Leeufontein Oa16, Letaba Oa26, Herschel Va30: > 900 mm
- Land Type Ae335: This land type has three (3) different terrain positions and the underlying geology is described as Medium-grained, yellowish, laminated sandstone of the Makgabeng Formation of the Waterberg Group, also sand of the Quaternary System. Soil series and the depth present are:

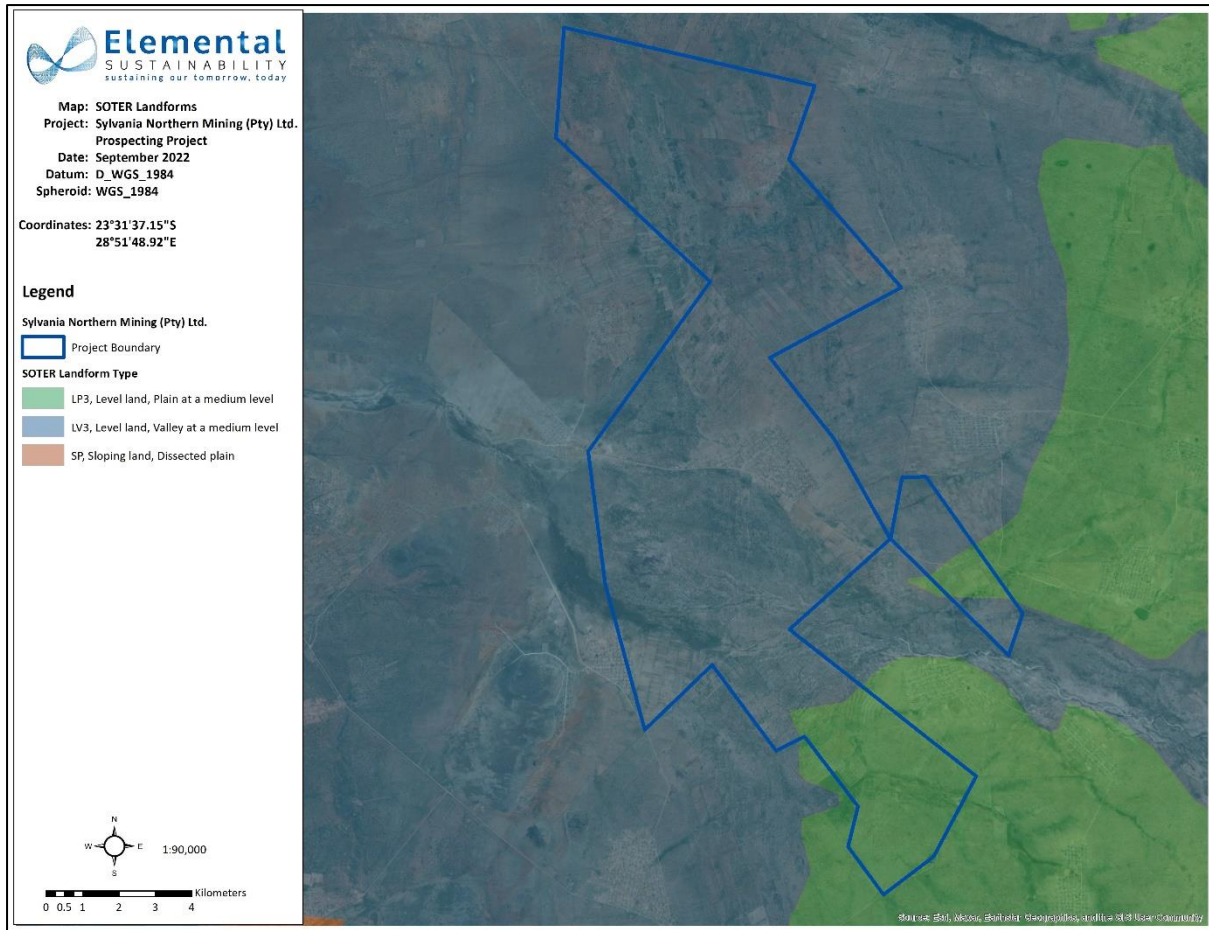


- Rock
- Portsmouth Hu35, Zwartfontein Hu34: >1200 mm
- Shorrocks Hu36, Portsmouth Hu35, Zwartfontein Hu34, Blinkklip Cv36: 400-600 mm
- Platt Gs14, Glenrosa Gs15, Williamson Gs16: 200-400 mm
- Herschel Va30, Arniston Va31, Valsrivier Va40: >900 mm
- Land Type Bd51: This land type has three (3) different terrain positions and the underlying geology is described as Leucocratic migmatite and gneiss, grey and pink hornblende-biotite gneiss, grey biotite gneiss; minor muscovite-bearing granite, pegmatite and gneiss of the Hout River Gneiss. Also sand and alluvium of the Quaternary System. Soil series and the depth present are:
  - Rock
  - Desktop Soil, Land Use and Land Capability Assessment Page 28 of 56 Shorrocks Hu36, Blinkklip Cv36: 400-900 mm
  - Soetmelk Av36: 700-950 mm
  - Zwartfontein Hu34, Portsmouth Hu35: 350-600 mm
  - Makuya Cv34, Denhere Cv35, Torquay Cv44: 300-700 mm
  - Platt Gs14, Glenrosa Gs15, Trevanian Gs17: 200-350 mm
  - Leksand Av24, Heidelberg Av34, Kareekuil Bv34: 500-1000 mm
  - Mkambati Kd14, Chitsa Lo32, Winterton Lo13, Wesselsnek Gc25: 200-1100 mm
  - Jozini Oa36, Limpopo Oa46: 500-1200 mm
  - Mispah Ms10, Loskop Ms12, Kalkbank Ms22: 100-400 mm
  - Lonetree Bv26, Wedgewood Bv35, Bainsvlei Bv36: 400-750 mm
  - Avalon Av26, Klerksdorp Pn36: 700-900 mm
  - Paddock We31, Davel We32: 200-400 mm
  - Dudfield Cv46: 400-700 mm
  - Windmeul Av35: 400-500 mm
  - Shigalo Hu46: 700-1200 mm
- Land Type Fc731: This land type has three (3) different terrain positions and the underlying geology is described as alluvium, sand and calcrete of the Quaternary System. Soil series and the depth present are:
  - Rock
  - Dudfield Cv46, Skipskop Cv45: 400-700 mm
  - Letaba Oa26, Shigalo Hu46, Shorrocks Hu36: 600-1200 mm
  - Lomondo Gs25, Lekfontein Gs26, Kalkbank Ms22: 100-300 mm
  - Limpopo Oa46, Calueque Oa45, Jozini Oa36, Dundee Du10: >900 mm
  - Valsrivier Va40, Lindley Va41, Weenen Bo40, Inhoek Ik20: >1200 mm
  - Stream beds

#### **10.11.2 SOTER Soil terrain, Generalised Soil Patterns and Landscape information**

According to the Soil and Terrain (SOTER) Landform database, the proposed prospecting right area is situated on two landform types, namely LP3 type landform (level land, plain at a medium level) on the southern section of the site, with the LV3 type landform (level land, valley at a medium level) forming most of the site (Figure 10-25).





**Figure 10-25: SOTER landform**

With reference to SOTER Generalised Soil Patterns associated with the area, the proposed prospecting project application area consists of three soil patterns (Figure 10-26). Most of the northern half of the study site consists of red-yellow, well drained soils, soils with a high base status. Soils with limited pedological development occurs in the southern section; these soils are usually shallow, on hard or weathering rock. Lime is generally present in the landscape. The remaining sections are classed as soils with a plinthic horizon; these are red, yellow and / or greyish soils with a high base status. As small section on the northwest border is classed as sandy soils with no profile development.

The SOTER Soil Association map categorises the proposed prospecting project application area as either an “A4” type landscape in the northern and southern sections and as “E1” type landscape in the central south section (Figure 10-27). “E1” is characterised by “*Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. (Association of Leptosols, Regosols, Calcisols and Durisols. In addition, one or more of Cambisols, Luvisols)*”. “A4” type landscape is characterised by “*Red, massive or weakly structured soils with high base status (association of well drained Lixisols, Cambisols and Luvisols)*”.

The dominant soil types, according to the SOTER database, are Ferric Luvisols (LVf) in the northern half and most southern section and Calcic Solonchaks (Sck) in the southern central half of the proposed prospecting project application area (Figure 10-28).

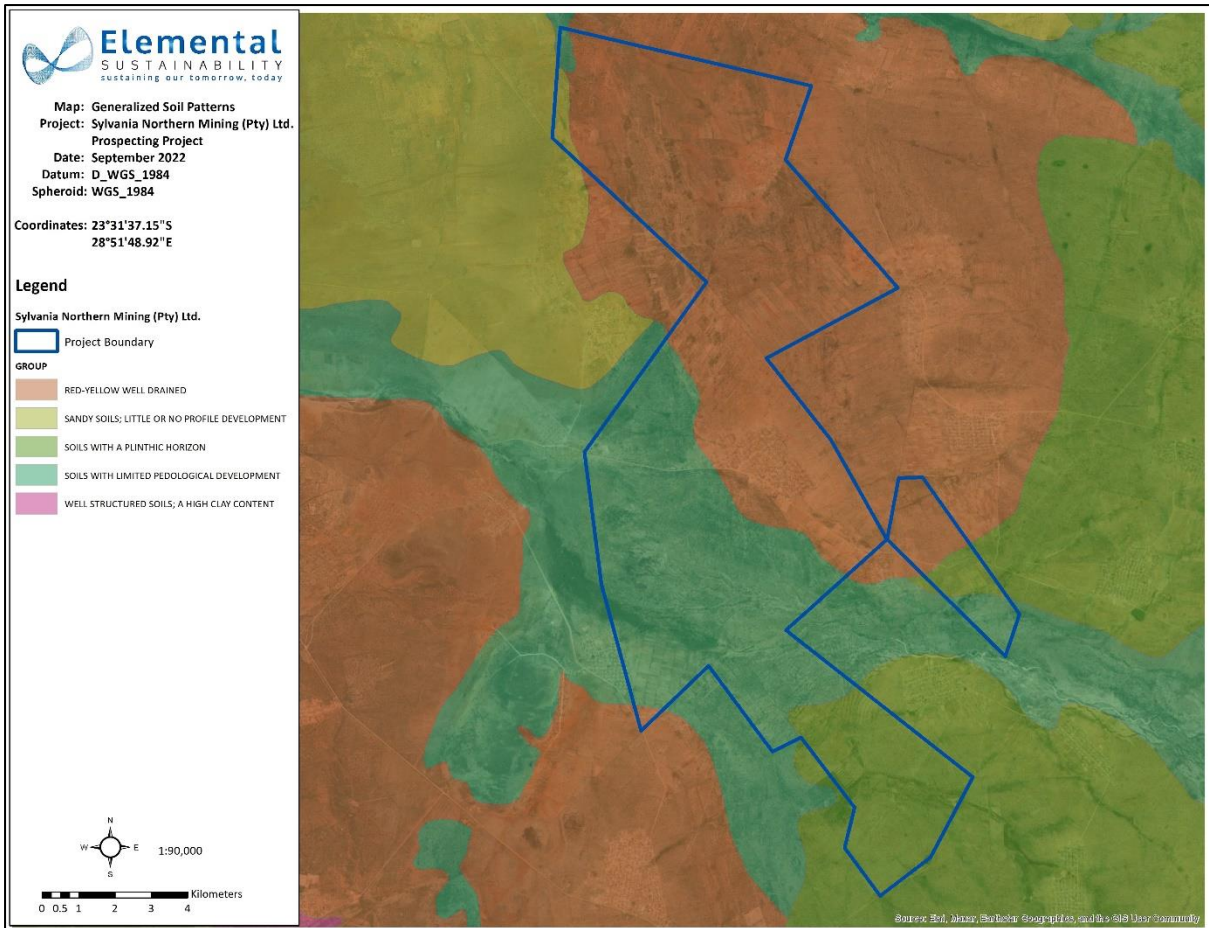


Figure 10-26: Generalised Soil Patterns

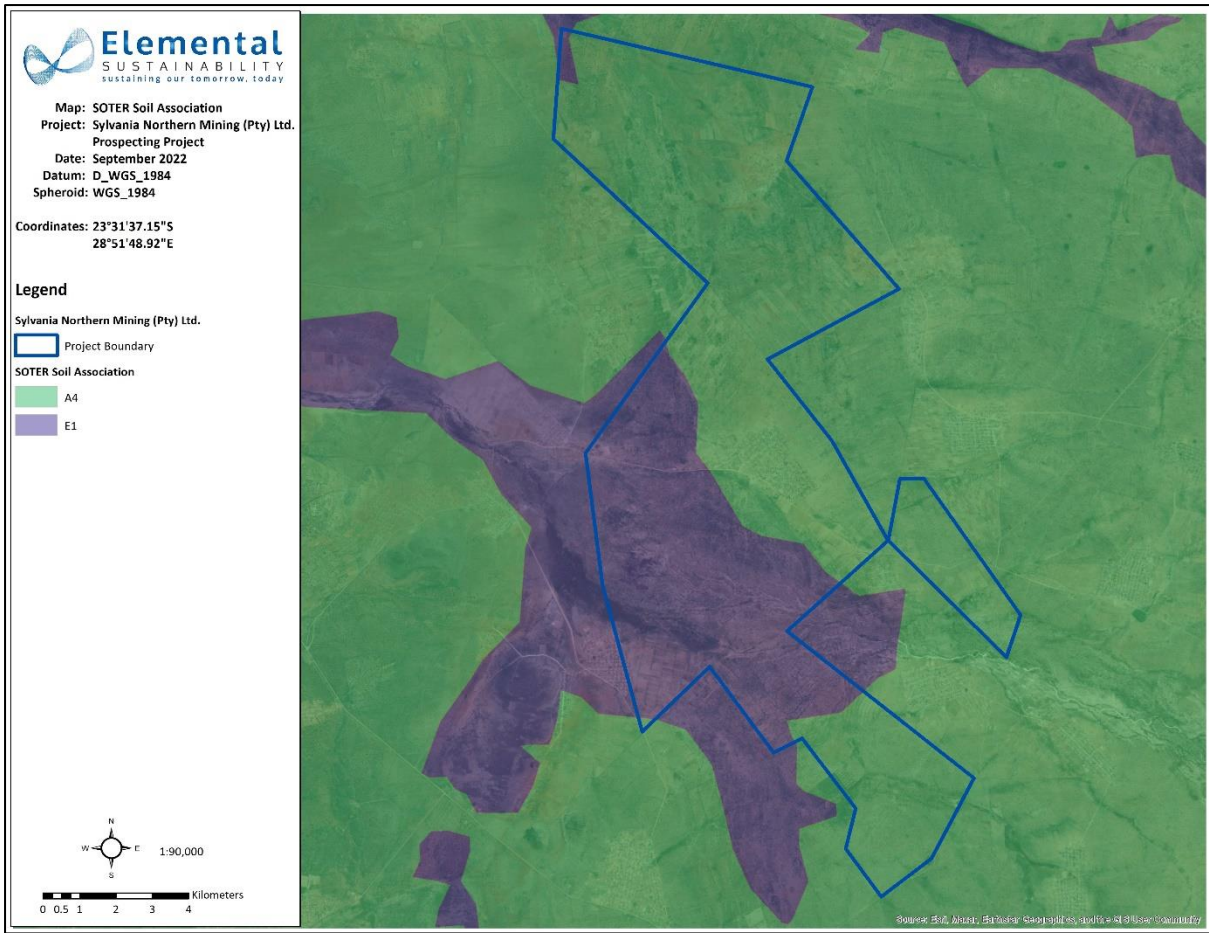
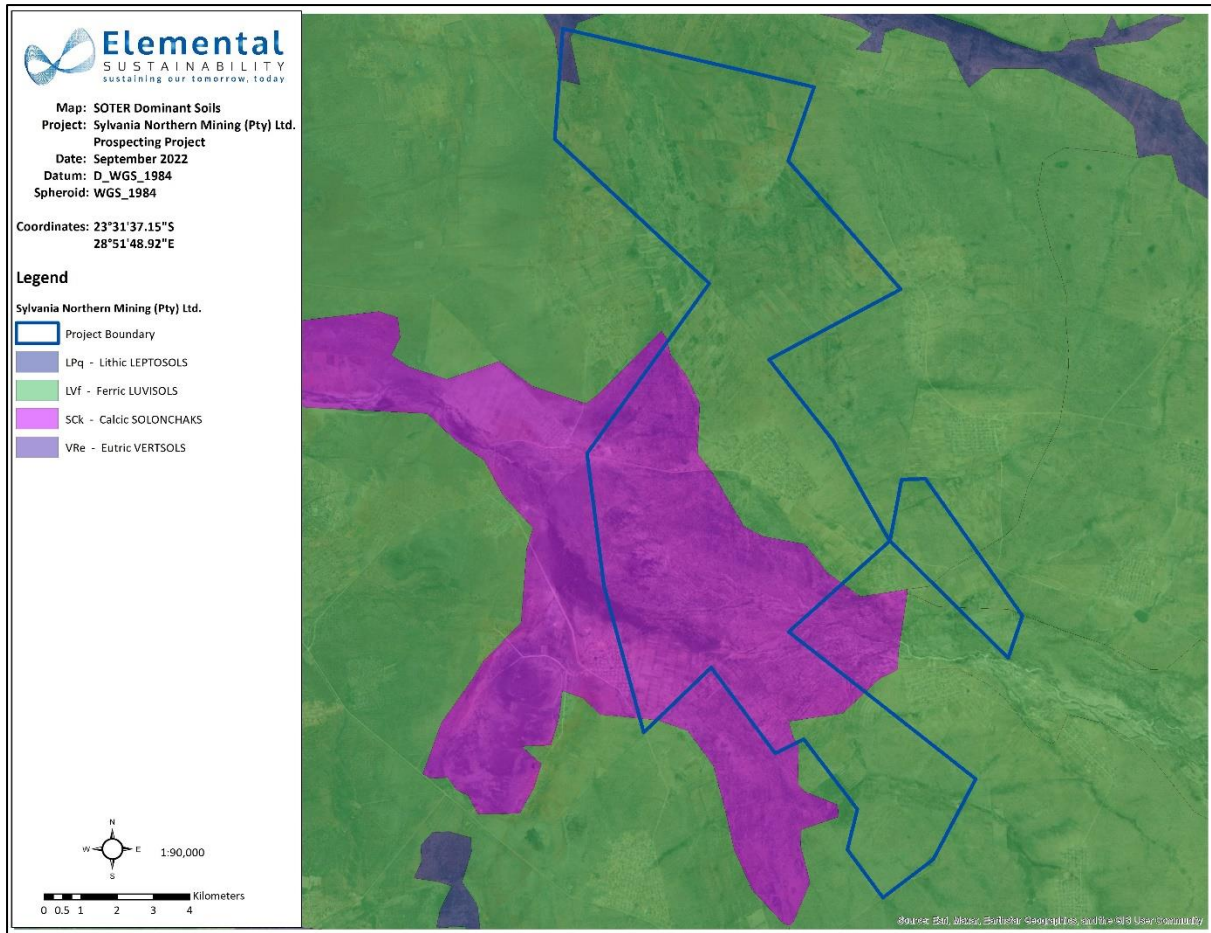


Figure 10-27: SOTER Soil association map



**Figure 10-28: Dominant Soils**

### 10.11.3 Land Capability Classification and Agricultural Potential

The distribution of the various land capability classes for the proposed application area, as defined in the National Land Capability for South Africa (Figure 10-29). The area proposed for prospecting is mostly classed as 06. Low-Moderate to 08. Moderate according to the National Land Capability Assessment (DAFF, 2017 as cited by Elemental Sustainability),

However, in accordance with Scotney *et al.*'s (1987) 8 classes, as cited by Elemental Sustainability, the proposed prospecting area has a Land Capability Class of 4 (IV) in the northern half and most southern section (Figure 10-30). This means that the land is classed as Arable but has severe limitations. These areas are suitable for the following: Wildlife (W), Forestry (F), Light Grazing (LG), Moderate Grazing (MG), Intensive Grazing (IG), and Light Cultivation (LC). A Land Capability Class of 5 (V) is present in the southern central areas. This means that the land is classed as Grazing but has wetness limitations.





improved and benefits from proper management can be expected. It is nearly level. Some occurrences are wet or frequently flooded. Other are stony, have climatic limitations, or have some combination of these limitations. Examples of Class V are:

- Bottomlands subject to frequent flooding that prevents the normal production of cultivated crops.
- Nearly level land with a growing season that prevents the normal production of cultivated crops.
- Level or nearly level stony or rocky land.
- Poned areas where drainage for cultivated crops is not feasible but which are suitable for grasses or trees.

## 10.12 SOCIO ECONOMY SITUATION

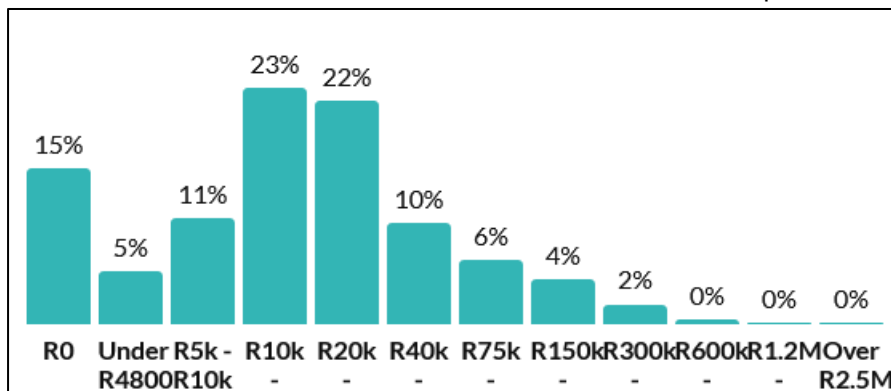
### 10.12.1 Waterberg district Municipality

#### 10.12.1.1 Mogalakwena Local Municipality

From the 2016 community survey information as summarised by wazimap<sup>29</sup> the population of the Mogalakwena LM are 325 292 of which 97% are Black African, 2% White and 1% Indian/Asian. 53% is female.

The most common language is Sepedi (80%), followed by Xitsonga (8%), Insindebele (4%), Not applicable (3%), Afrikaans (2%) and Other (1%).

The annual household income is R14 600 and the distribution is provided in the figure below:



26.2% is employed and 51% is considered to be Other not economically active. Employment is 70% in the formal sector. 7% of children between 15 and 17 are in the labour force.

In terms of service delivery, the following is noted:

- 71.1% get water from a regional or local service provider;
- 45% has piped water inside the yard;
- 4.4% has no electricity and 90% has in-house prepaid meters;
- 27.4% have access to flush or chemical toilets and 1.6% have no access to any toilets;
- 34% are getting refuse removal from a local authority, private company or community members while 59% has their own dump;

With regards to education, 65.7% completed Grade 9 or higher, 32.9% completed Matric or higher.

<sup>29</sup> <https://wazimap.co.za/profiles/municipality-LIM367-mogalakwena/> 15 September 2022

From the 2020 – 2021 IDP, it is noted that the Mogalakwena municipality is serviced by Three Hospitals, One Health Centre, Twenty-Nine Clinics and Twelve Mobile Clinics. And more than 80% of the population is within 120 minutes from health facilities.

### 10.12.2 Capricorn District Municipality

#### 10.12.2.1 Blouberg Local Municipality

Based on previous census data, it can be concluded that the population of the Blouberg<sup>30</sup> LM declined from 182 003 in 2000 to 176 135, before declining further to 172 601 in 2016. This decline was attributed to the low fertility rate, high mortality rate compared to birth rate or the out migration by the economically active population to the industrial centres such as Polokwane and Gauteng to seek better economic prospects.

Information was sourced from the Community survey done in 2016 as summarised by wazimap.co.za<sup>31</sup>.

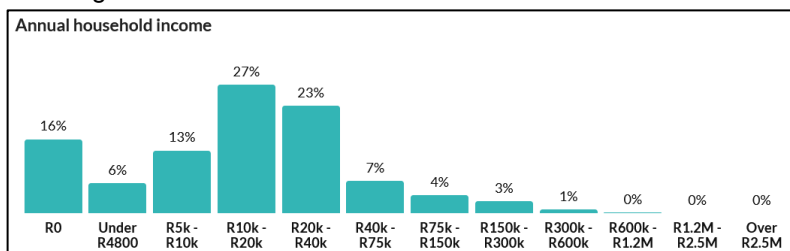
The most common language in the area is Sepedi (95%) followed by Afrikaans (1%) and not applicable (3%).

With regards to service delivery<sup>31</sup> the following is important to note:

- 72.4% of the population receive water from a regional or a local service provider and 38% has piped water inside the yard;
- 2.2% of the population has no access to electricity, of those supplied with electricity 95% have in-house prepaid meters;
- 4.5% of the population has access to flush or chemical toilets and 6.1% has no access to toilets;
- 15.6% are getting refuse disposal from a local authority, private company or community members.

In terms of economics the following is noted:

- The annual household income average is R14 600 per annum and the distribution is indicated in the figure below:



- 17.7% is employed and 64% are classified as Other / Not economically active. The main sector of employment is Formal sector (53%).
- 6.4% of children between the ages 15 and 17 are in the labour force

With regards to education 57.7% completed grade 9 or higher and 24.8% completed Matric or higher.

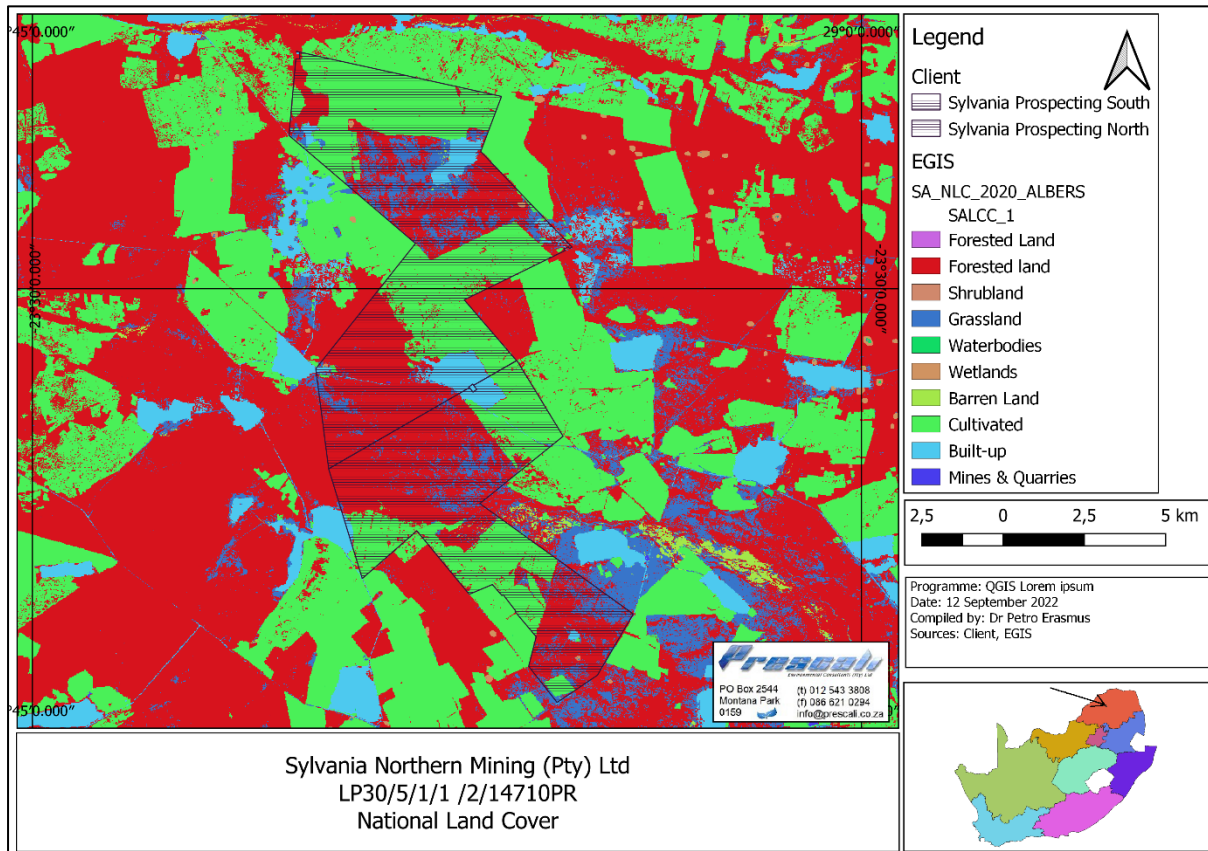
### 10.13 DESCRIPTION OF THE CURRENT LAND USES

The predominant land use in this area is bare unused land (forested land, barren lands) followed by Built up areas (Villages), please refer to Figure 10-31. This was also confirmed by the Soil and Land Use assessment conducted by Elemental Sustainability in 2022.

<sup>30</sup> <http://www.blouberg.gov.za/?q=node/12> 15 September 2022

<sup>31</sup> <https://wazimap.co.za/profiles/municipality-LIM351-blouberg/> 15 September 2022





**Figure 10-31: Land cover used to infer land uses**

#### 10.14 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

Exploration was previously conducted by Hacra and Pan Palladium. There are also defunct buildings owned by Public Works on Altona as well as build up areas (Figure 10-31). All access roads are gravel.

##### 10.14.1 Surface water features

Environmentally sensitive (Forster, N., DeMeo, T., & Ditto, N.D., 1995) (Envirometrics and MetroGIS, 2009) areas defined as landscape elements or places which are vital to the long-term maintenance of biological diversity, soil, water or other natural resources both on the site and in a regional context, includes:

- Wildlife habitat areas inclusive of:
  - Focus areas for contributing to biodiversity thresholds that are likely to become future protected areas;
  - Private nature reserves, conservancies, core areas of biosphere reserves and other protected areas that are part of a stewardship programme or provincial protected area expansion strategy;
  - National and Provincial Parks and Reserves as defined in the National Environmental Management: Protected Areas Act, 2003 (Act NO. 57 of 2003), as amended;
  - National Parks view-shed protection areas that contain sensitive view areas around National Parks as identified by SANParks;
  - Priority areas in the vicinity of National Parks that have been identified for the long-term survival of biodiversity around the National Parks or upon which the long-term survival of the parks depend to a significant extent; and
  - Critically endangered and endangered ecosystems as identified by the South African National Biodiversity Institute;

- Steep slopes consisting of:
  - All areas with a slope of 8 degrees or steeper; and
  - Important topographical features topographical features that were delineated using the 20 m contour interval terrain model of South Africa and based on the inherent scenic value of these features;
- Rivers, wetlands and other water bodies consisting of rivers with a potential zone of influence buffer of 32 metres on each side from the banks of the rivers, wetlands with a potential zone of influence of 10 metres from the edge of the wetlands and dams with a potential zone of influence of 10 metres from their high-water lines, please refer to the sections below; and
- Prime agricultural lands.

Also included in the sensitive features are the regulated areas as per the NWA:

- 1 in 100-year flood – Sensitivity ranking: Very High;
- 100 m buffer for watercourses (Sensitivity ranking High) and 500 m buffer for wetlands (Sensitivity ranking High); and
- Riparian area (Sensitivity ranking Very High).

The interconnectivity of these sensitive areas creates greenway corridors that consists of networks of linked landscape elements that provide ecological, recreational, and cultural benefits to a community. (Forster, N., DeMeo, T., & Ditto, N.D., 1995).

Information from the Screening tool relating to the aquatic environment was the same as for the 2018 wetland information reported in this report.

Based on the above assessment, the Very High and High sensitivity areas are thus as indicated in Figure 10-32.

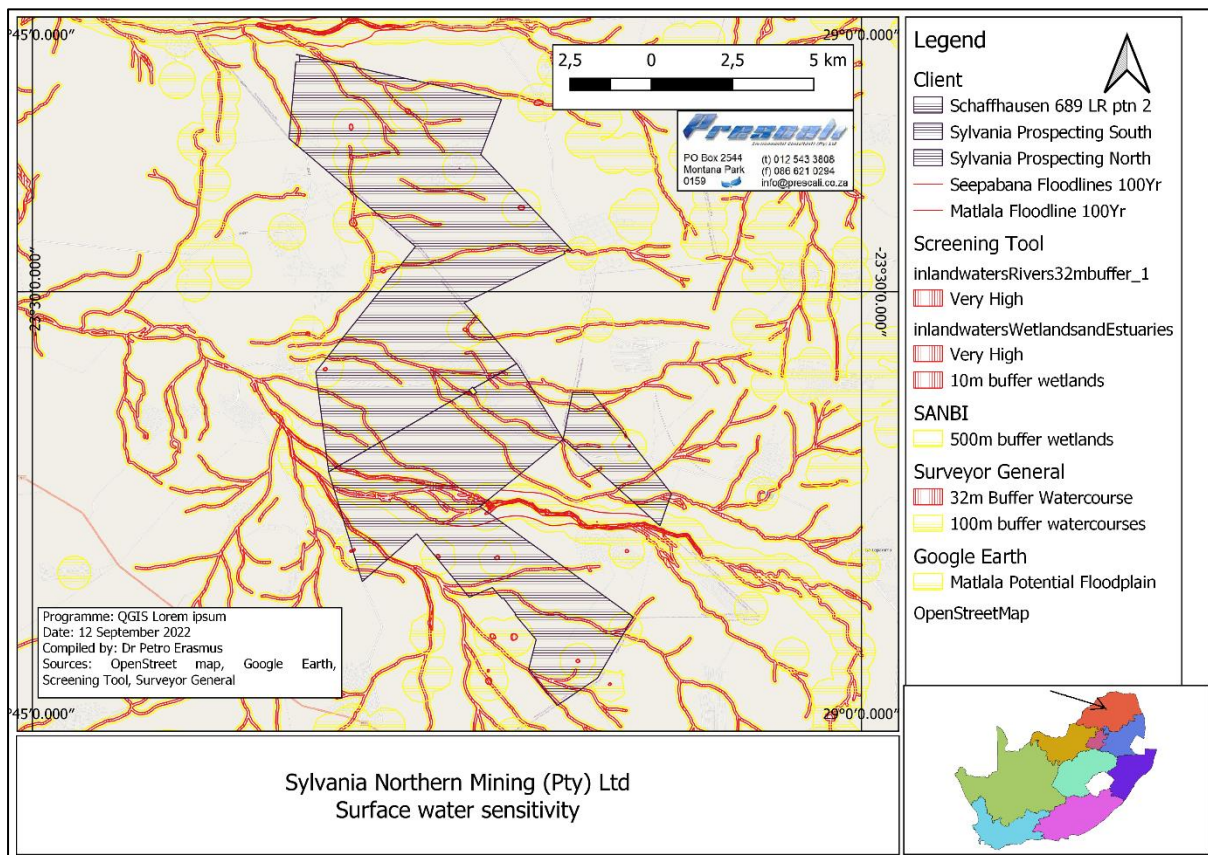


Figure 10-32: Sensitive features in the Prospecting Right application area

### 10.14.2 Terrestrial Biodiversity and Ecological Features

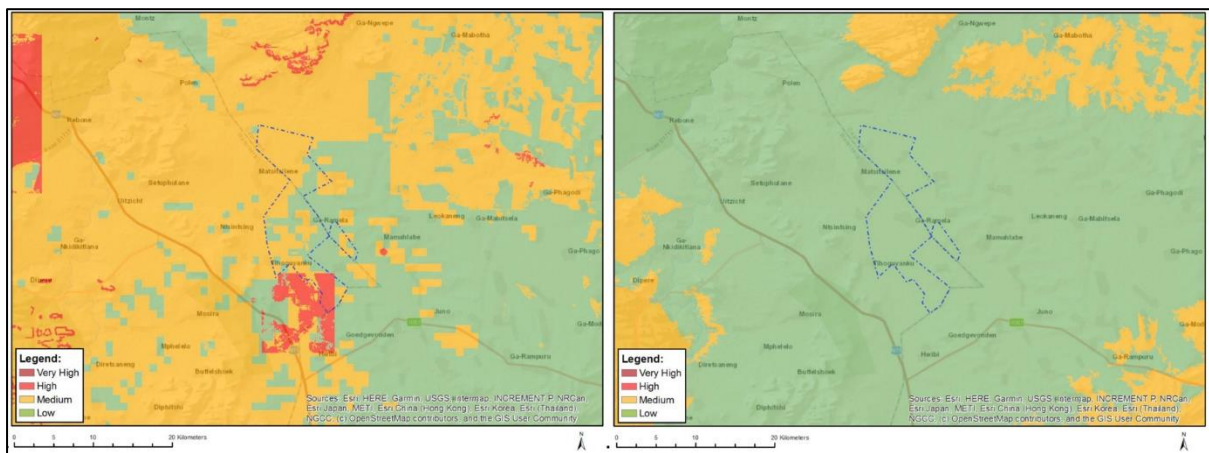
The Prospecting Right areas contains the following classes from the LCP and District Bioregional Plans: CBA1, CBA2, ESA1, ESA2, NNR and ONA. However, the majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 are located on areas categorised as CBA2 and ESA2. The north-eastern section of the Prospecting Right area is located in the transition zone of the Vhembe Biosphere Reserve.

None of the flora species previously recorded for the area on POSA are Species of Conservation Concern (SCC) in terms of their Red List status. However, fifteen (15) faunal species previously recorded in the area queried are categorised as SCC.

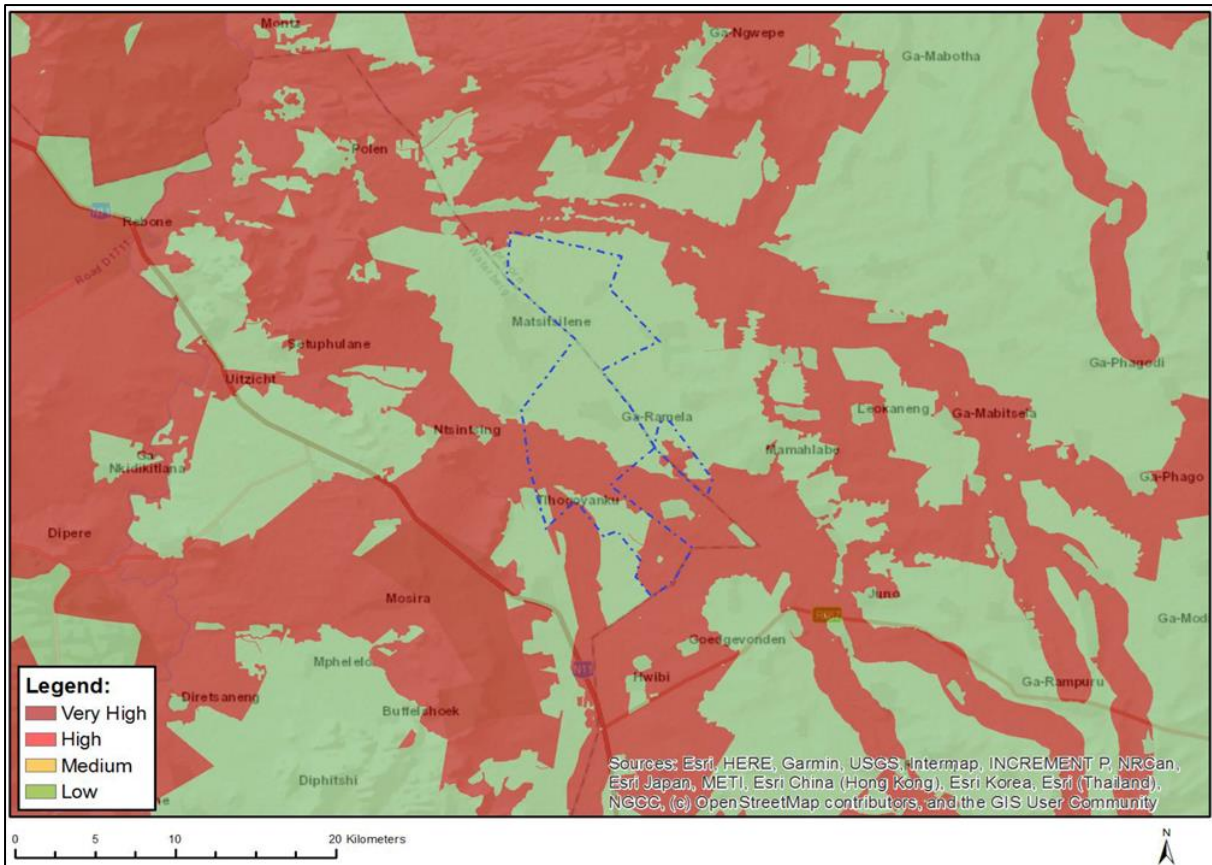
From satellite imagery of the Prospecting Right areas the following impacts are apparent:

- Numerous dirt roads. Impacts from human and vehicle movement on these roads are expected.
- Extensive dryland crop farming has taken place on the Prospecting Right area.
- A number of villages and residences are located on and adjacent to the Prospecting Right area.
- Heavy livestock grazing and wood harvesting is expected, as reported in previous ecological studies conducted on the study area (M2 Environmental Connections, 2014 and Scientific Aquatic Services, 2013 as cited by Red Kite).
- Exotic and Alien Invasive Plant species proliferation is expected, as reported in previous ecological studies conducted on the study area (M2 Environmental Connections, 2014 and Scientific Aquatic Services, 2013 as cited by Red Kite).

The National Web Based Environmental Screening Tool indicated that the project footprint is of low, moderate and high sensitivity in terms of animal species and low sensitivity in terms of plant species sensitivity. The terrestrial biodiversity theme for the project area is indicated as low and very high (refer to figures below).



**Figure 10-33: Map of animal species (left) and plant species (right) theme sensitivity as per the Environmental Screening Tool Report**



**Figure 10-34: Environmental Screening Tool maps of terrestrial ecology themes sensitivity**

Based on the desktop assessment findings, the Terrestrial Ecology sensitivity is considered as follows:

- All untransformed areas indicated as Critical Biodiversity Areas are considered high sensitivity;
- All watercourses and their associated riparian zones are considered high sensitivity; and
- The remainder of the Prospecting Right area is considered low sensitivity.

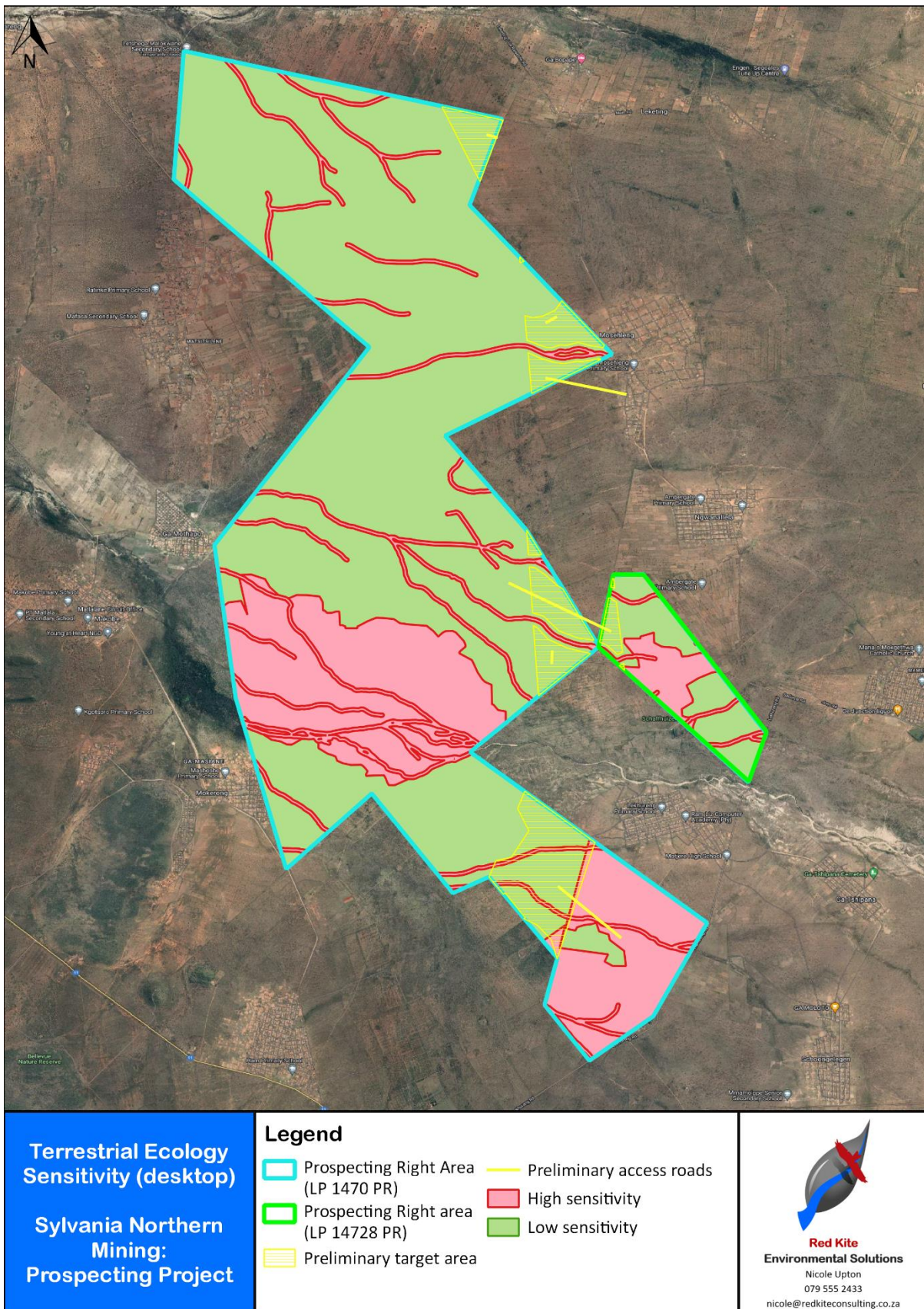


Figure 10-35: Terrestrial Ecological Sensitivity map

### 10.14.3 Archaeological

Based on the report the following significant ratings were attributed to the sites identified and that could occur within the prospecting application area:

- Sites 1 and 2 are ruins of recent historical settlement (due to location outside of the application area these were given a low significance);
- Sites 3 & 4 – Sections of low, stone-packed walls dating to recent historical periods (Low Cultural Heritage Significance);
- Sites 5, 6 and 7 are graveyards / cemeteries (High Cultural Significance);
- 50 m buffer zone around High cultural significance rating site were given a High Cultural Significance rating; and
- 50 – 100 buffer zone around High Cultural significance rating site were given a Medium Cultural Significance rating.

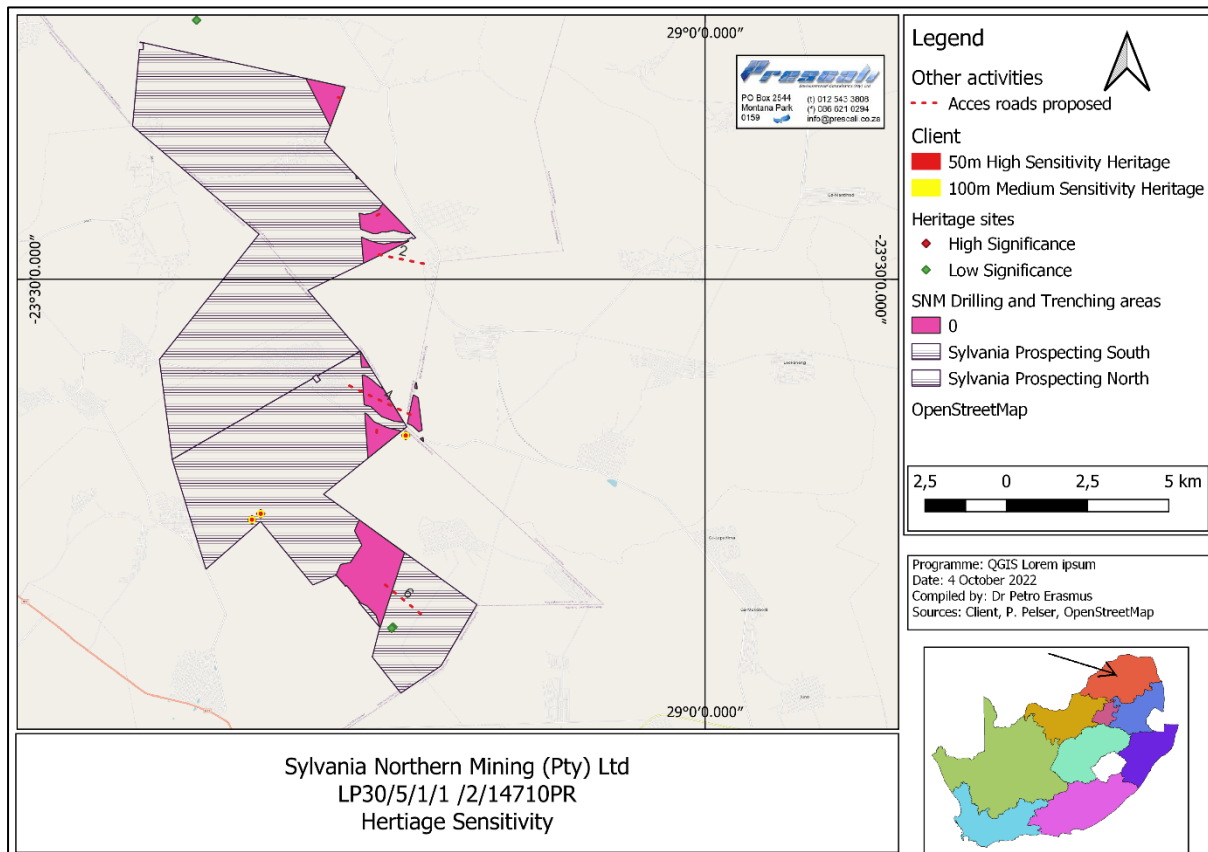


Figure 10-36: Heritage resources significance rating

#### 10.14.4 Agricultural Sensitivity

In accordance with the Land Capability Classification (LCC), Figure 10-37 indicates that the areas where the proposed prospecting activities are to take place is situated in areas of Medium Agricultural Sensitivity and overlaps with areas of High Field Crop Sensitivity for Subsistence Farming (Figure 10-38).

Considering all the baseline properties of the soils, and the weather conditions of the region, the areas proposed for the prospecting application is suitable for small-scale and subsistence dry land agriculture and impacts are expected to be moderate. These baseline land capabilities are also used as a benchmark for rehabilitation, and thus the area can be returned to Class 4 (IV) and 5 (V) during project decommissioning and rehabilitation if effective mitigation is applied. The proposed activities may impact on the subsistence farming, as it overlaps with suitable areas.

Any Pivot Irrigation (Very High) agricultural area should be considered as no-go areas and no prospecting activities should take place in these areas. No other areas have been identified within the application area that can be classified as no-go areas based on the sensitivity of the soils or agricultural potential.

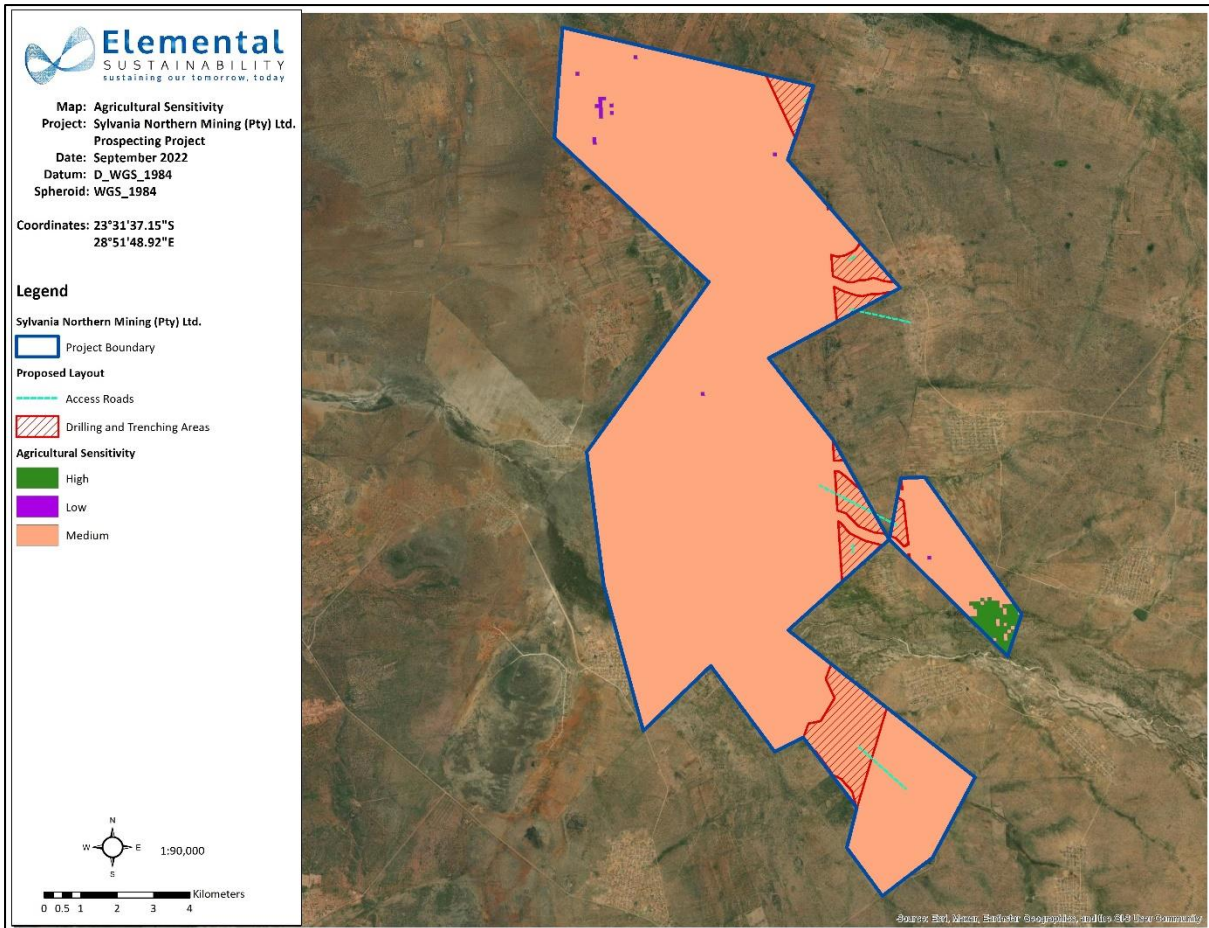
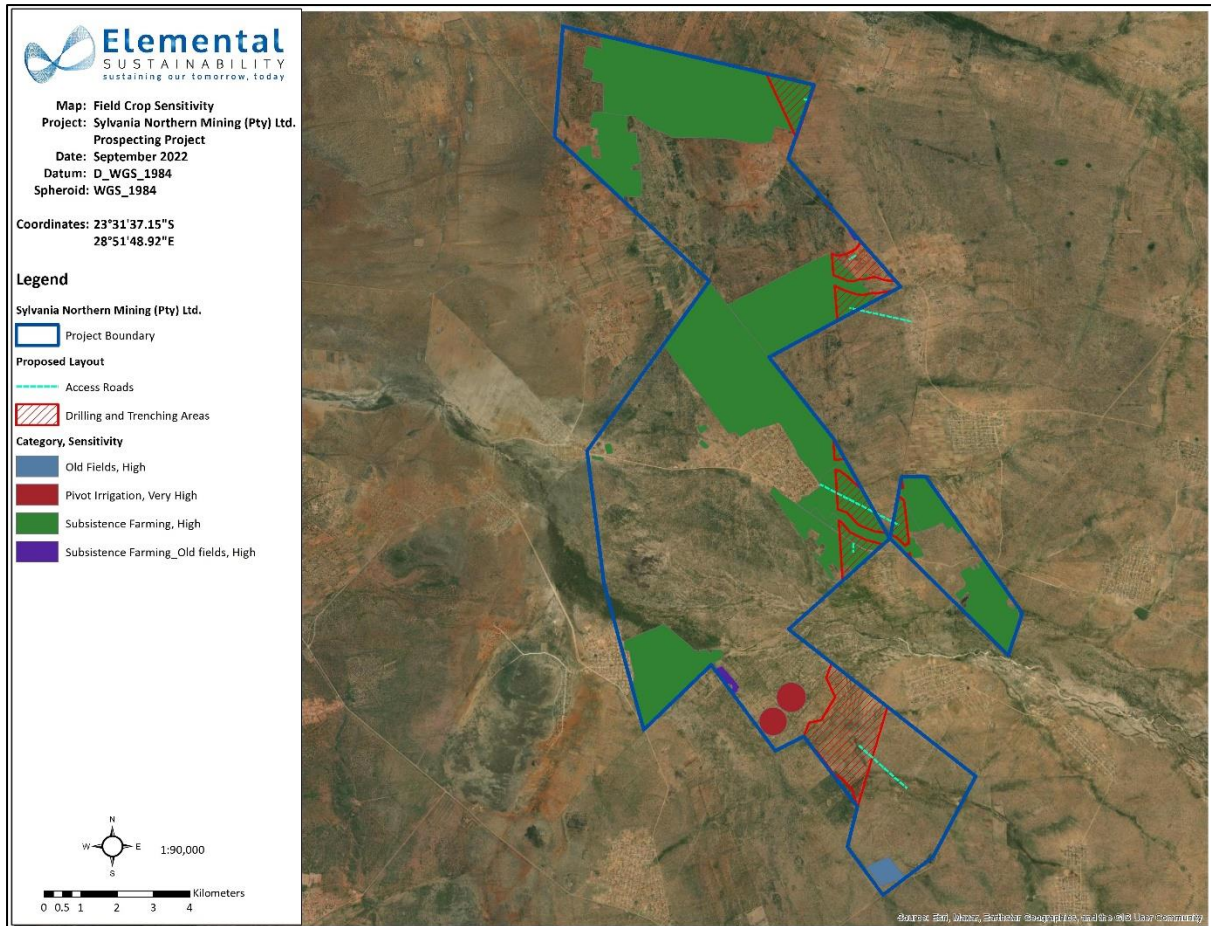


Figure 10-37: Agricultural sensitivity of the proposed prospecting project application area (DEA – Screening Tool).



**Figure 10-38: Crop Fields sensitivity of the proposed prospecting project application area (DEA – Screening Tool).**

**10.15 ENVIRONMENTAL AND CURRENT LAND USE MAP**  
 (Show all environmental, and current land use features)

Please refer to Figure 10-39.



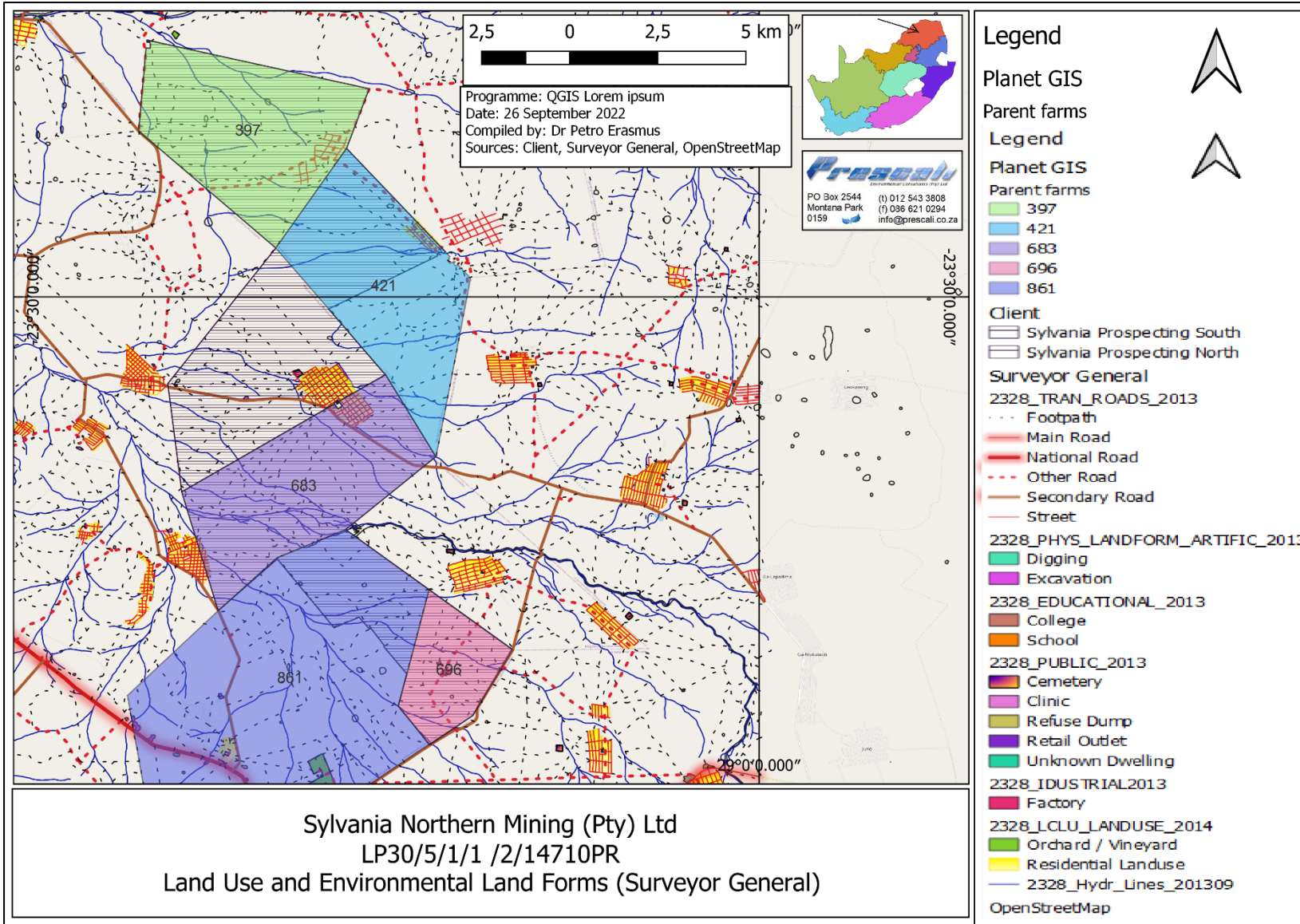


Figure 10-39: Environmental and Current Land Use Map

## 11 POSITIVE AND NEGATIVE IMPACTS IDENTIFIED THAT THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED

The proposed prospecting activities to be undertaken include the use of both invasive and non-invasive prospecting techniques. A summary of the positive (+) and negative impacts of the proposed activity are provided in below.

**Table 11-1: Identified Positive and Negative Impacts**

Aspect	Activity	Activity	Impact	Phase
Topography	All prospecting activities	All prospecting activities	Impact on topography that result in water ponding - area not free-draining	C, O, R, CI
Geology	All prospecting activities	All prospecting activities	Sterilisation of mineral resource as a result of prospecting activities.	C, O, R, CI
Groundwater	All prospecting activities	All prospecting activities	Impact on groundwater quality as a result of hydrocarbon spills from machinery.	C, O, R, CI
Groundwater	All prospecting activities	All prospecting activities	Impact on groundwater levels	C, O, R, CI
Air quality	All prospecting activities	All prospecting activities	Dust generated as a result of the prospecting activities including travelling on road could impact on local PM10 levels.	C, O, R, CI
Noise	All prospecting activities	All prospecting activities	The operation of machinery could result in increased noise levels in an area that is rural in nature. This noise could become a nuisance to the residents.	C, O, R, CI
Socio-Economic	All prospecting activities	All prospecting activities	(+) Very few employment opportunities will be created during prospecting. However, it is anticipated that a few (<10) could be created that will result in a positive economic impact.	C, O, R, CI
Socio-Economic	All prospecting activities	All prospecting activities	The proposed prospecting activities could create awareness of the area by people seeking employment and result in people moving to the area in case of future employment opportunities should the mineral be viable for full scale mining. This could negatively affect the existing social aspects of the area and impact on the sustainability of services such as schools, clinics, police etc.	C, O, R, CI
Surface water quality	Ground geophysics and soil geochemical sampling	Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C

Aspect	Activity	Activity	Impact	Phase
Surface water quality	Ground geophysics and soil geochemical sampling	Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O
Surface water quality	Ground geophysics and soil geochemical sampling	Topsoil stockpiling/ Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Ground geophysics and soil geochemical sampling	Replace topsoil	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R
Surface water quality	Ground geophysics and soil geochemical sampling	Replace topsoil	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	R
Surface water quality	Trenching	Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C
Surface water quality	Trenching	Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O
Surface water quality	Trenching	Topsoil stockpiling/ Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Trenching	Overburden stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O
Surface water quantity	Trenching	Containment of rainwater in trench	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	O

Aspect	Activity	Activity	Impact	Phase
Surface water quality	Trenching	Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O
Surface water quality	Trenching	Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	C, O
Surface water quality	Trenching	General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	C, O
Surface water quality	Resource drilling: drill pad and sump	Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O
Surface water quality	Resource drilling: drill pad and sump	Drilling sludge	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	O
Surface water quality	Resource drilling: drill pad and sump	Vegetation removal & General activities	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Resource drilling: drill pad and sump	Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C
Surface water quantity	Resource drilling: drill pad and sump	Operation of drill pad sump	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	O
Surface water quality	Resource drilling: drill pad and sump	Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	C, O
Surface water quality	Resource drilling: drill pad and sump	Capping of Borehole	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse	R

Aspect	Activity	Activity	Impact	Phase
			which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	
Surface water quality	Resource drilling: drill pad and sump	Rip impacted area	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R
Surface water quality	Resource drilling: drill pad and sump	Rip impacted area	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	R
Surface water quality	Resource drilling: drill pad and sump	General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	C, O
Surface water quality	Access road	Vegetation removal (all access roads combined)	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C
Surface water quality	Access road	Daily travelling to prospecting site	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O
Surface water quality	Access road	Daily travelling to prospecting site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O
Surface water quality	Access road	Rip road area	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R
Surface water quality	Prospecting activities (all)	Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quality as a result of hydrocarbon spills and siltation from run-off.	C, O
Surface water quantity	Prospecting activities (all)	Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quantity; however, it is expected that the boreholes and trenching will be done consecutively thus the impact severity should not increase from that of the individual activities.	O

Aspect	Activity	Activity	Impact	Phase
Surface water quality	Prospecting activities (all)	Cumulative impact: Big area (Areas 1, 2, 3 and 4)	During the rehabilitation phase water quality could be impacted as a result of hydrocarbon spills and from siltation from ripped areas that are not vegetated.	R
Heritage and Archaeological	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on open-air Stone Age sites that could be found in the area, most likely in the form of individual stone tools or small scatters. The possibility of Iron Age sites (especially stone-walled Late Iron Age sites) in the areas can also not be excluded, although this is less likely	C, O
Heritage and Archeologically	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on Iron Age sites (especially stone-walled Late Iron Age sites) although this is less likely than Stone Age sites.	C,O
Heritage and Archeologically	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on recent historical sites and features as the possibility of their presence the area is High, and will most be represented by the remnants of individual homesteads and rural settlements.	C,O
Heritage and Archeologically	Prospecting activities (all)	Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on both formal & informal cemeteries, individual graves and even previously unknown & unmarked graves.	C,O
Terrestrial biodiversity	Development activities	Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities will lead to destruction and damage of habitats and vegetation communities and overall loss of biodiversity and ecosystem function within the clearance and operational area. Destruction of habitat may lead to faunal species migrating to other more favourable areas.	O
Terrestrial biodiversity	Development activities	Drilling, Roads, Trenching and geochemical sampling	The continuous human activity over a longer-term period may further impact on the faunal communities within the area. Associated noise, waste, the smell of humans and physical infiltration into remaining natural areas are problematic and may lead to declining populations (where the disturbance of habitat has caused habitat remaining to become unfavourable).	O



Aspect	Activity	Activity	Impact	Phase
Terrestrial biodiversity	Development activities	Vegetation clearance	Vegetation clearance will destroy indigenous vegetation and lead to possible invasive and/or exotic species establishing in the area and edge-effects occurring surrounding the prospecting activities. Bare areas may become vulnerable to Alien and Invasive Plant species and these may compete with indigenous species, likely leading to the migration of sensitive species from the site to a more favourable habitat.	C, O
Terrestrial biodiversity	Development activities	Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities may impact on areas designated as high sensitivity, including critical biodiversity areas and watercourses situated in and around the Prospecting Right area. The majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 are located on areas categorised as CBA. The layout of the prospecting target areas appear to have been designed to avoid most of the non-perennial tributaries. The activity may lead to the loss of species of conservation concern. Based on the desktop study findings, no flora SCC are considered to be likely to occur on the project area. However, fifteen (15) faunal species previously recorded in the area queried are categorised as SCC.	O
Terrestrial biodiversity	Development activities	Rehabilitation	Rehabilitation could be ineffective if rehabilitation actions are not effectively implemented. Without the necessary mitigation measures, rehabilitation will be less successful and the ecology of the impacted areas may not recover to a pre-prospecting state. Without mitigation the alien invasive species may increase and result in a degraded veld condition making the property less viable for post-closure land use activities such as wilderness, grazing and agriculture.	CI, Post CI

Aspect	Activity	Activity	Impact	Phase
Soil, Land Use and Land Capability	All	Soil stripping	Soil Erosion	C
Soil, Land Use and Land Capability	All	Vehicles driving on the soil surface	Compaction and loss of soil structure	C
Soil, Land Use and Land Capability	All	Spillages of hydrocarbons	Soil pollution and contamination	C
Soil, Land Use and Land Capability	All	Soil stripping	Soil Erosion	O
Soil, Land Use and Land Capability	All	Soil Stripping / Trenching and Drilling	Dilution of topsoil through mixing with subsoil; Loss of topsoil as a resource	O
Soil, Land Use and Land Capability	All	Soil Stripping / Trenching and Drilling	Decline in organic matter & biological activity	O
Soil, Land Use and Land Capability	All	Soil Stripping /Trenching and Drilling	Loss of water holding capacity	O
Soil, Land Use and Land Capability	All	Vehicles driving on the soil surface	Compaction and loss of soil structure	O
Soil, Land Use and Land Capability	All	Soil Stripping / Trenching and Drilling	Loss of land capability and land use	O
Soil, Land Use and Land Capability	All	Spills from vehicles, accidental spills of hazardous chemicals	Soil pollution and contamination	O
Soil, Land Use and Land Capability	All	Stockpiling of Soil	Loss of Topsoil as a Resource: Compaction and Erosion	Cl, R
Soil, Land Use and Land Capability	All	Backfilling of soil material layers	Loss of land capability	Cl, R

## 11.1 METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

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

### 11.1.1 Assessment Criteria

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines (DEAT, 1998) and as amended from time to time (DEAT, 2002).

The level of detail as depicted in the EIA Guidelines (DEAT, 2002) was fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

An explanation of the impact assessment criteria is defined below.



**Table 11-2: Impact Assessment Criteria**

<b>EXTENT</b>	
<b>Classification of the physical and spatial scale of the impact</b>	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
<b>DURATION</b>	
<b>The lifetime of the impact that is measured in relation to the lifetime of the proposed development.</b>	
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the Site Establishment phase.
Short to Medium term	The impact will be relevant through to the end of a Site Establishment phase (1.5 years).
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime i.e. exceed 30 years of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
<b>INTENSITY</b>	
<b>The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as</b>	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
<b>PROBABILITY</b>	
<b>This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:</b>	
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0 %).
Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25 %.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50 %.
Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.

The status of the impacts and degree of confidence with respect to the assessment of the significance must be stated as follows:

- **Status of the impact:** A description as to whether the impact would be positive (a benefit), negative (a cost), or neutral.

- **Degree of confidence in predictions:** The degree of confidence in the predictions, based on the availability of information and specialist knowledge.

Other aspects to take into consideration in the specialist studies are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the full-lifecycle of the proposed development, including Site Establishment, operation and decommissioning.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region.
- The specialist studies must attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

### 11.1.2 Mitigation

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

### 11.1.3 Determination of Significance-Without Mitigation

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

**Table 11-3: Significance-Without Mitigation**

<b>NO SIGNIFICANCE</b>	The impact is not substantial and does not require any mitigation action.
<b>LOW</b>	The impact is of little importance, but may require limited mitigation.
<b>MEDIUM</b>	The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
<b>HIGH</b>	The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

### 11.1.4 Determination of Significance- With Mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

**Table 11-4: Significance-With Mitigation**

<b>NO SIGNIFICANCE</b>	The impact will be mitigated to the point where it is regarded as insubstantial.
<b>LOW</b>	The impact will be mitigated to the point where it is of limited importance.
<b>LOW TO MEDIUM</b>	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
<b>MEDIUM</b>	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
<b>MEDIUM TO HIGH</b>	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.

<b>HIGH</b>	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.
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### 11.1.5 Assessment Weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

### 11.1.6 Ranking, Weighting and Scaling

For each impact under scrutiny, a scaled weighting factor is attached to each respective impact (refer Table 11-5).

The purpose of assigning weights serves to highlight those aspects considered the most critical to the various stakeholders and ensure that each specialist's element of bias is considered. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

**Table 11-5: Description of assessment parameters with its respective weighting**

EXTENT		DURATION		INTENSITY		PROBABILITY		WEIGHTING FACTOR (WF)		SIGNIFICANCE RATING (SR)	
Footprint	1	Short term	1	Low	1	Improbable	1	Low	1	Low	0-19
Site	2	Short to Medium	2			Possible	2	Low to Medium	2	Low to Medium	20-39
Regional	3	Medium term	3	Medium	3	Likely	3	Medium	3	Medium	40-59
National	4	Long term	4			Highly Likely	4	Medium to High	4	Medium to High	60-79
International	5	Permanent	5	High	5	Definite	5	High	5	High	80-100
MITIGATION EFFICIENCY (ME)				SIGNIFICANCE FOLLOWING MITIGATION (SFM)							
High		0.2		Low				0 – 19			
Medium to High		0.4		Low to Medium				20 – 39			
Medium		0.6		Medium				40 – 59			
Low to Medium		0.8		Medium to High				60 – 79			
Low		1.0		High				80 – 100			

### 11.1.7 Identifying the Potential Impacts Without Mitigation Measures (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

$$\text{Significance Rating (WOM)} = (\text{Extent} + \text{Intensity} + \text{Duration} + \text{Probability}) \times \text{Weighting Factor}$$

### 11.1.8 Identifying the Potential Impacts with Mitigation Measures (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

#### 11.1.8.1 Mitigation Efficiency (ME)

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation efficiency (ME) rating (refer to *Table 11-5*).

The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and Empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

$$\text{Significance Rating (WM)} = \text{Significance Rating (WOM)} \times \text{Mitigation Efficiency}$$

or  $\text{WM} = \text{WOM} \times \text{ME}$

#### 11.1.9 Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations considered.

### 11.2 THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.

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

The mitigation measures have been addressed in Part A Section 15 and in Part B Sections 5 and 6

### 11.3 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

Minerals are site specific. 4 boreholes and 8 trenches will be developed and though the exact location is not available, the general areas in which they will be located have been identified based on the current knowledge of the geology of the area. Exclusion areas have been identified and no prospecting activities will take place in these areas, refer to Figure 3-3.

### 11.4 STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE

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

Since prospecting is temporary in nature no permanent structures will be constructed, negotiations and agreements will be made with the farm owners / surface right users to use any existing infrastructure like accommodation for the explorers, access roads, etc. In addition to the information provided, each of the phases is dependent on the results and success of the preceding phase. The location and extent of sampling will be determined based on information derived from the surveys. Sampling sites will be selected to avoid water courses.

The proposed application area has been selected due to the geology of the site and the anticipated favourable tectono-stratigraphic setting of the prospect area. There are no protected areas within the application area. No prospecting will occur in close proximity to watercourses.

Based on the exclusion zones and the known geology the following priority areas were identified where the prospecting activities will take place. Location of potential access roads were also inferred, please refer to Figure 3-3.



## **11.5 FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE.**

*(In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)*

In order to identify the potential impacts associated with the proposed prospecting activities the following steps were undertaken:

- The stakeholder consultation process was undertaken in a manner to be interactive, providing landowners, lawful occupiers and identified stakeholders with the opportunity to provide input into the project. This is a key focus, as the local residents has capabilities of providing site specific information, which may not be available in desktop research material. Stakeholders were requested to provide their views on the project and any potential concerns which they may have. All comments and concerns are captured and formulated into the impact assessment.
- A detailed desktop investigation was undertaken to determine the environmental setting in which the project is located. Based on the desktop investigations various resources were used to determine the significance and sensitivity of the various environmental considerations. The desktop investigation involved the use of:
  - Detailed mapping based on existing data sources applicable to the study area;
  - Geographic Information System base maps;
  - Literature and existing data/reports for the study area.
- A site visit was conducted to ensure that the information gathered as part of the desktop investigation reflects the current status of the land.
- Desktop specialist studies were undertaken in aspects that has been specifically identified within the Environmental Screening Report for the area.
- The ratings of the identified impacts were undertaken in a quantitative manner as provided in Impact Assessment Section. The ratings were undertaken in a manner to calculate the significance of each of the impacts. The EAP also assesses the outcomes of the calculation to determine whether the outcome reflects the perceived and the actual views.
- The identification of management measures is done based on the significance of the impacts and measures that have been considered appropriate and successful, specifically as Best Practical and Economical Options.

The issues and risks identified were rated and the results of the assessment before and after the implementation of management measures are outlined in Part A Section 12. Please also refer to Part A Section 10.14 for how the Very High and High Sensitivity areas were taken into consideration during the final site layout plan compilation.



## 12 ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

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

Please also refer to Figure 3-3 and Part A, Section 5 for additional information. Based on the above the following impacts were identified to occur on the four identified farms, the impacts quantification is per borehole.

**Table 12-1: Impact Assessment Rating as a result of invasive prospecting activities (E: Extend, D: Duration, I: Intensity, P: Probability, WF: Weighing Factor, SWOM: Significance without mitigation, ME: Mitigation efficiency, SWM; Significance with mitigation, C: Construction, O: Operational, R: Rehabilitation, CI: Closure)**

Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
Topography	Impact on topography that result in water ponding - area not free draining	C, O, R, CI	1	3	1	2	1	Low	0,4	Low
Geology	Sterilisation of mineral resource as a result of prospecting activities.	C, O, R, CI	1	4	1	1	1	Low	0,4	Low
Groundwater	Impact on groundwater quality as a result of hydrocarbon spills from machinery.	C, O, R, CI	1	1	1	1	1	Low	0,4	Low
Groundwater	Impact on groundwater levels	C, O, R, CI	1	1	1	1	1	Low	0,4	Low
Air quality	Dust generated as a result of the prospecting activities including travelling on road could impact on local PM10 levels.	C, O, R, CI	2	4	1	2	2	Low	0,4	Low
Nosie	The operation of machinery could result in increased noise levels in an area that is rural in nature. This noise could become a nuisance to the residents.	C, O, R, CI	3	4	3	4	2	Low - Medium	0,4	Low
Socio-Economic	(+) Very few employment opportunities will be created during prospecting. However, it is anticipated that a few (<10) could be created that will result in a positive economic impact.	C, O, R, CI	3	4	3	4	5	Medium - High	1	Medium - High
Socio-Economic	The proposed prospecting activities could create awareness of the area by people seeking employment and result in people moving to the area in case of future employment opportunities should the mineral be viable for full scale mining. This could negatively affect the existing social aspects of the area and impact on the sustainability of services such as schools, clinics, police etc.	C, O, R, CI	3	4	3	3	5	Medium - High	0,6	Low - Medium
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat,	C	1	1	1	2	2	Low	0,4	Low



Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
	flow regime and the physico & chemical quality of the water in the watercourse.									
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O	1	1	1	2	2	Low	0,4	Low
Surface water quality	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O	1	1	1	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R	1	1	1	2	2	Low	0,4	Low
Surface water quality	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	R	1	1	1	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C	1	2	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quantity	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	O	1	2	3	2	2	Low	0,4	Low



Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
Surface water quality	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C	1	2	2	2	2	Low	0,4	Low
Surface water quantity	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	O	1	2	3	2	2	Low	0,4	Low
Surface water quality	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat,	R	1	2	2	2	2	Low	0,4	Low





Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
	flow regime and the physico & chemical quality of the water in the watercourse.									
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R	1	2	2	2	2	Low	0,4	Low
Surface water quality	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	R	1	2	2	2	2	Low	0,4	Low
Surface water quality	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	C, O	1	2	2	2	2	Low	0,4	Low
Surface water quality	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C	1	3	2	2	2	Low	0,4	Low
Surface water quality	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O	1	3	2	2	2	Low	0,4	Low
Surface water quality	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	C, O	1	3	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R	1	3	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	C	1	3	2	2	2	Low	0,4	Low
Surface water quality	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	O	1	3	2	2	2	Low	0,4	Low
Surface water quality	Contamination from spills from chemical toilets / emptying of septic tank (if applicable) could impact on	O	1	3	2	2	2	Low	0,4	Low



Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
	water quality which in turn could impact on the biota and habitat as well.									
Surface water quality	Contaminated water from material storage area could detrimentally impact on watercourses quality, biota and habitat.	O	1	3	2	2	2	Low	0,4	Low
Surface water quality	Contaminated water from waste storage area could detrimentally impact on watercourses quality, biota and habitat.	O	1	3	2	2	2	Low	0,4	Low
Surface water quality	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	C, O	1	3	2	2	2	Low	0,4	Low
Surface water quality	Hydrocarbon spills from vehicles and other equipment could negative impact water quality, habitat and biota.	C, O	1	3	2	2	2	Low	0,4	Low
Surface water quality	Potential for spills from e.g. hydrocarbon tanks, septic tank, chemical toilets could impact on the surface water resource quality, habitat and biota if not managed.	R	1	3	2	2	2	Low	0,4	Low
Surface water quality	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	R	1	3	2	2	2	Low	0,4	Low
Surface water quantity	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	C, O	1	3	2	2	2	Low	0,4	Low
Heritage and archaeological	The proposed prospecting activities could impact on open-air Stone Age sites that could be found in the area, most likely in the form of individual stone tools or small scatters. The possibility of Iron Age sites (especially stone-walled Late Iron Age sites) in the areas can also not be excluded, although this is less likely	C, O	1	1	3	2	3	Low - Medium	0,2	Low
Heritage and archaeological	The proposed prospecting activities could impact on Iron Age sites (especially stone-walled Late Iron Age sites) although this is less likely than Stone Age sites.	C,O	1	1	3	2	3	Low - Medium	0,2	Low
Heritage and archaeological	The proposed prospecting activities could impact on recent historical sites and features as the possibility of their presence the area is High, and will most be	C,O	1	1	3	4	3	Low - Medium	0,2	Low



Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
	represented by the remnants of individual homesteads and rural settlements.									
Heritage and archaeological	The proposed prospecting activities could impact on both formal & informal cemeteries, individual graves and even previously unknown & unmarked graves.	C,O	2	3	5	4	5	Medium - High	0,2	Low
Terrestrial biodiversity	Invasive prospecting and associated activities will lead to destruction and damage of habitats and vegetation communities and overall loss of biodiversity and ecosystem function within the clearance and operational area. Destruction of habitat may lead to faunal species migrating to other more favourable areas.	O	2	2	2	5	2	Low - Medium	0,8	Low
Terrestrial biodiversity	The continuous human activity over a longer-term period may further impact on the faunal communities within the area. Associated noise, waste, the smell of humans and physical infiltration into remaining natural areas are problematic and may lead to declining populations (where the disturbance of habitat has caused habitat remaining to become unfavourable).	O	3	2	2	4	3	Low - Medium	0,8	Low - Medium
Terrestrial biodiversity	Vegetation clearance will destroy indigenous vegetation and lead to possible invasive and/or exotic species establishing in the area and edge-effects occurring surrounding the prospecting activities. Bare areas may become vulnerable to Alien and Invasive Plant species and these may compete with indigenous species, likely leading to the migration of sensitive species from the site to a more favourable habitat.	C, O	4	3	3	3	3	Low - Medium	0,6	Low - Medium
Terrestrial biodiversity	Invasive prospecting and associated activities may impact on areas designated as high sensitivity, including critical biodiversity areas and watercourses situated in and around the Prospecting Right area. The majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 are located on areas categorised as CBA. The layout of the prospecting target areas appears to have been designed to avoid most of the non-perennial tributaries. The activity may lead to the loss of species of conservation concern. Based on the desktop study findings, no flora SCC are considered to be likely to	O	3	4	3	2	3	Low - Medium	0,4	Low



Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
	occur on the project area. However, fifteen (15) faunal species previously recorded in the area queried are categorised as SCC.									
Terrestrial biodiversity	Rehabilitation could be ineffective if rehabilitation actions are not effectively implemented. Without the necessary mitigation measures, rehabilitation will be less successful and the ecology of the impacted areas may not recover to a pre-prospecting state. Without mitigation the alien invasive species may increase and result in a degraded veld condition making the property less viable for post-closure land use activities such as wilderness, grazing and agriculture.	CI, Post CI	2	3	3	3	3	Low - Medium	0,6	Low - Medium
Soil, Land Use and Land Capability	Soil Erosion	C	1	2	1	2	2	Low	0,2	Low
Soil, Land Use and Land Capability	Compaction and loss of soil structure	C	1	2	1	2	3	Low	0,2	Low
Soil, Land Use and Land Capability	Soil pollution and contamination	C	1	2	1	2	3	Low	0,2	Low
Soil, Land Use and Land Capability	Soil Erosion	O	2	3	3	4	4	Medium	0,4	Low
Soil, Land Use and Land Capability	Dilution of topsoil through mixing with subsoil; Loss of topsoil as a resource	O	2	4	2	3	3	Low - Medium	0,4	Low
Soil, Land Use and Land Capability	Decline in organic matter & biological activity	O	2	3	2	3	4	Medium	0,4	Low
Soil, Land Use and Land Capability	Loss of water holding capacity	O	2	3	2	3	4	Medium	0,4	Low
Soil, Land Use and Land Capability	Compaction and loss of soil structure	O	2	4	3	4	4	Medium	0,6	Low - Medium
Soil, Land Use and Land Capability	Loss of land capability and land use	O	2	4	4	4	4	Medium	0,8	Medium



Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
Soil, Land Use and Land Capability	Soil pollution and contamination	O	2	3	3	4	3	Low - Medium	0,2	Low
Soil, Land Use and Land Capability	Loss of Topsoil as a Resource: Compaction and Erosion	Cl, R	1	2	2	3	3	Low - Medium	0,2	Low
Soil, Land Use and Land Capability	Loss of land capability	Cl, R	1	2	2	3	3	Low - Medium	0,4	Low

**Table 12-2: Cumulative impacts**

Aspect	Impact	Phase	E	D	I	P	WF	SWOM	ME	SWM
Surface water quality	The proposed prospecting activities could impact on surface water quality as a result of hydrocarbon spills and siltation from run-off.	C, O	1	3	3	4	2	Low - Medium	0,4	Low
Surface water quantity	The proposed prospecting activities could impact on surface water quantity; however, it is expected that the boreholes and trenching will be done consecutively thus the impact severity should not increase from that of the individual activities.	O	1	3	3	3	2	Low	0,4	Low
Surface water quality	During the rehabilitation phase water quality could be impacted as a result of hydrocarbon spills and from siltation from ripped areas that are not vegetated.	R	1	3	3	4	2	Low - Medium	0,4	Low
Soil, Land Use and Land capability	The impact on the local food security on the areas where prospecting activities will take place, will be moderate as the capacity of the area to sustain large number of grazing animals is moderate and high for subsistence farming. With the expected soil degradation occurring and most areas proposed for prospecting overlapping with high subsistence farming potential, a decline in the overall soil quality and health is expected and may hinder the future land use for grazing and crop production on the areas where prospecting will take place.	C, O	2	3	3	4	4	Medium	0,4	Low
Terrestrial biodiversity	The prospecting activity could impact on the fauna and Flora biodiversity of the area and result in increased AIPs infestation.	C, O	2	3	3	4	4	Medium	0,4	Low

### 13 SUMMARY OF SPECIALIST REPORTS

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

**Table 13-1: Summary of Specialist reports (Desktop)**

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations that have been included in the EIA report (mark with an x where applicable)	Reference to applicable section of report where specialist recommendations have been included.
Surface water	If the management measures and recommendation as outlined in this report is implemented it is recommended that the proposed prospecting activities be authorized	X	Part A Section 15 Part B Section 6
Terrestrial biodiversity	It is the reasoned opinion of the specialist that the development may continue if all recommended mitigation measures are implemented from the onset of the development. A field assessment is recommended to assess the habitat conditions and to ascertain whether any Species of Conservational Concern (SCC) occur on the project footprint before construction begins.	X	Part A Section 15 Part B Section 6
Soil and Land capability	The identified impacts can be reduced by keeping the footprints minimised where possible and strictly following soil management measures. If the soil management measures are followed and the land rehabilitated to the highest standard possible, grazing or even crop production will be possible on the rehabilitated land. The main mitigation of the expected impacts will consist of compensation to the farmer, equivalent to the possible loss of agricultural income and food security. It is therefore the opinion of the author that the activity should be authorised, and that the layout proposed for the development is acceptable from a soil and agricultural potential perspective if mitigation is applied. It follows that the recommendations and mitigation requirements as set out in this report should form part of the conditions of the environmental authorisation for the proposed project.	X	Part A Section 15 Part B Section 6
Heritage	That the proposed Sylvania Northern Mining (Pty) Ltd Prospecting/Mining Rights Application on various farms in the Mokopane Magisterial District, 67km north-west of Mokopane and 61km north-west of Polokwane, be allowed to continue with the condition that once the final detailed locations of the Prospecting Boreholes and Trenches has been determined that detailed field-based assessments be carried out in these areas to determine the impacts of these activities on any possible cultural heritage (archaeological and/or historical) sites and remains. Any resultant proposed future mining activities and related developments and operations will have to then be assessed as well.	X	Part A Section 15 Part B Section 6

## 14 ENVIRONMENTAL IMPACT STATEMENT

### 14.1 SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The findings are that the proposed prospecting activities will result in Low to Medium-High impact for the various physical and socio-economic aspects of the environment before the implementation of the identified mitigation / management measures and a Low to Medium impact following mitigation / management measures implementation.

All Very High and High sensitivity areas as identified should be avoided.

Monitoring of the required mitigation measures is to take place on site at a continuous basis by the project manager, contractors and Environmental Control Officer.

#### 14.1.1 Final Site Map

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

Please refer to Figure 14-1 and Figure 14-2.

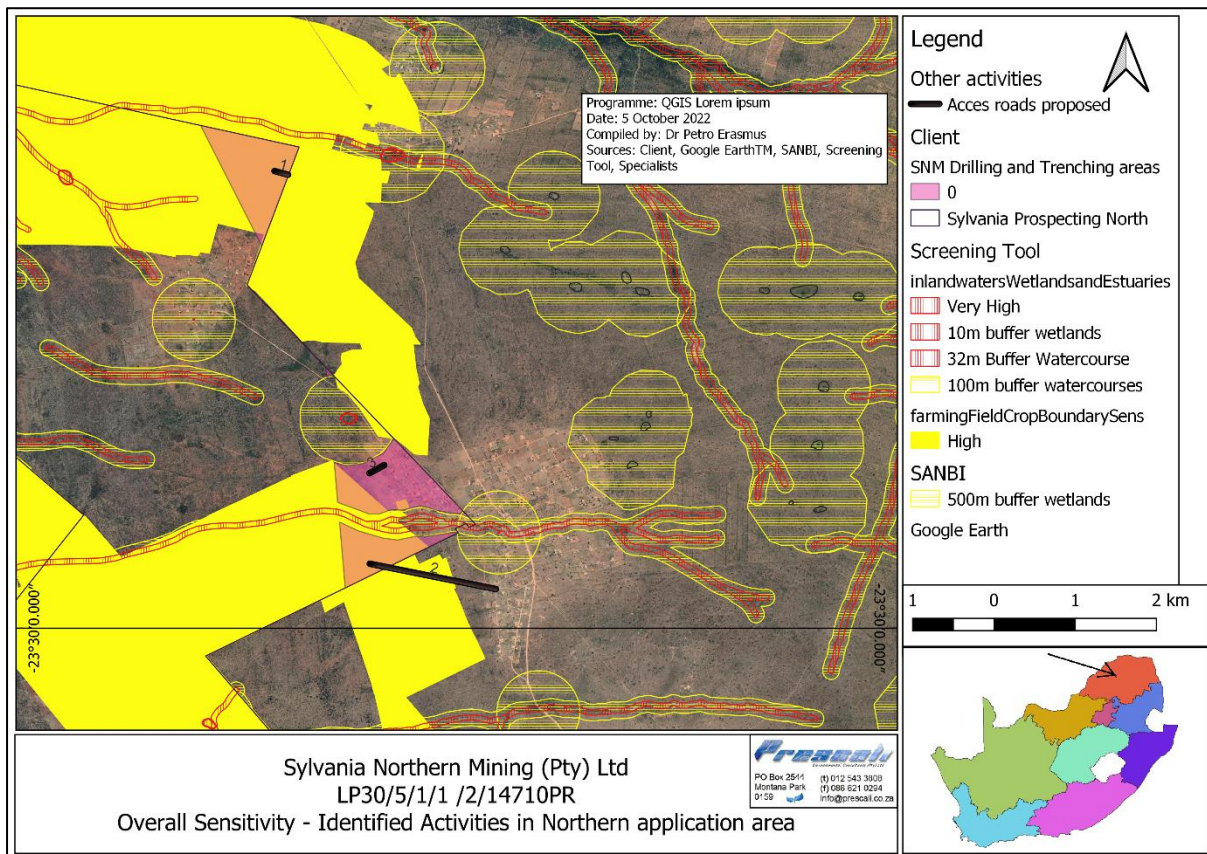


Figure 14-1: Location of identified invasive prospecting activities: Northern area

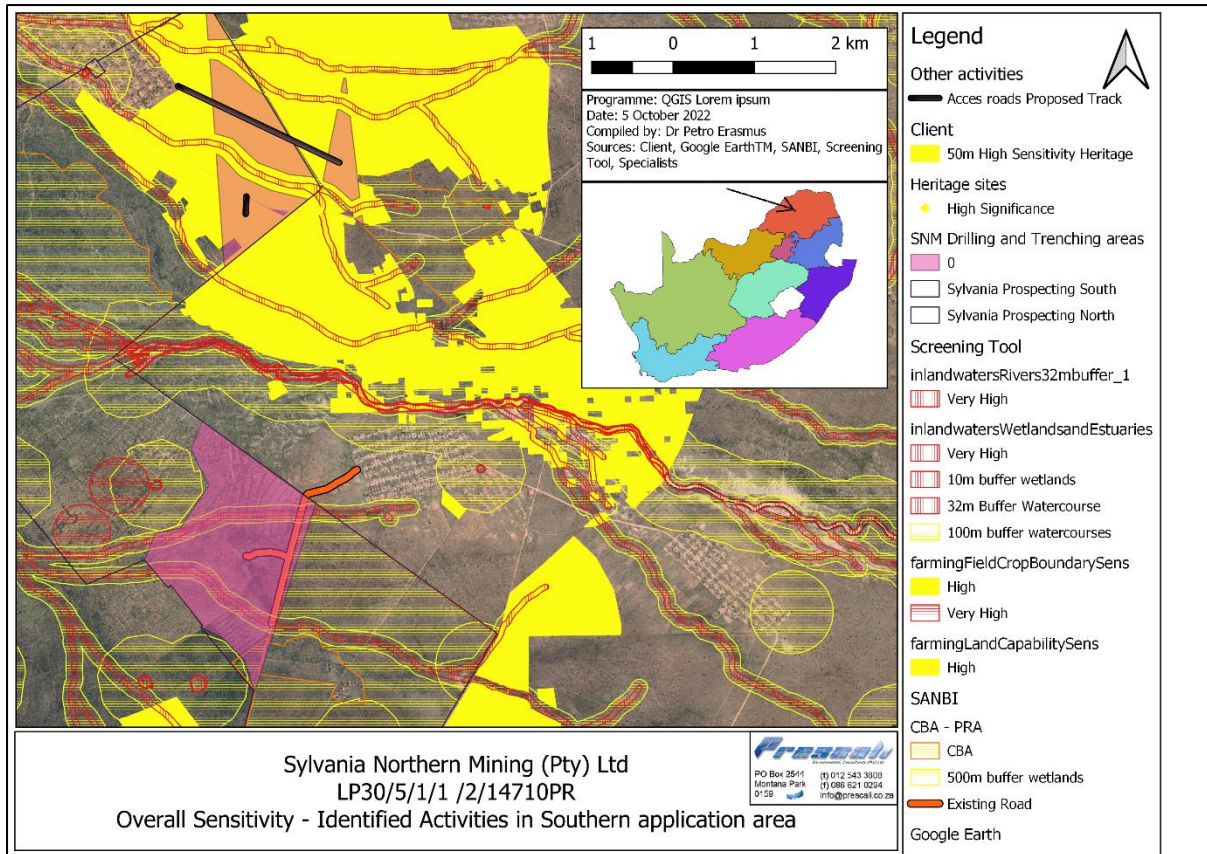


Figure 14-2:. Location of identified invasive prospecting activities: Southern area

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

Refer to Table 11-1 which highlights all the positive and negative impacts for the proposed prospecting activities. The proposed activities have a Low to Medium-High significance impact before management is implemented, after the implementation of management measures the risk is Low to Medium. The probability of occurrence of an impact was determined and most of these activities can be controlled and impacts can be reduced or avoided.

As far possible existing roads will be used to access the four main areas identified where prospecting will take place, the proposed locations already exclude the surface water buffer areas.

### 15 PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR

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

Impact management objectives are described in terms of a Mitigation Hierarchy as promoted by Prescali Environmental Consultant and takes into consideration general requirements for impact management. The mitigation hierarchy is as follows:

- **Avoid at Source:** Reduce at Source: avoiding or reducing at source through the design of the Project (e.g. avoiding by placing or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).
- **Abate on Site:** add something to the design to abate the impact (e.g. pollution control equipment, installation of noise silencers, operate in daylight hours).
- **Abate at Receptor:** if an impact cannot be abated on-site then control measures can be implemented off-site (e.g. noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals straying onto the site).





- **Repair or Remedy:** some impacts involve unavoidable damage to a resource (e.g. agricultural land due to creating access, work camps or materials storage areas) and these impacts can be addressed through repair, restoration or reinstatement measures.
- **Compensate in Kind; Compensate Through Other Means:** where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g. planting to replace damaged vegetation, financial compensation for damaged crops or providing community facilities for loss of resources, recreation and amenity space)

The EMPr will seek to achieve a required end state and describe how activities could have an adverse impact on the environment will be mitigated, controlled and monitored. The EMPr will address the environmental impacts during the Construction, Operational, and Decommissioning (Closure/Rehabilitation) Phases of the proposed project. Due regard will be given to environmental protection during the entire project. A number of environmental recommendations will therefore be made to achieve environmental protection. The environmental and social objectives will be set to allow prospecting in an environmental and socially responsible manner while ensuring that sustainable closure can be achieved. To achieve closure, the correct decisions need to be taken during the planning phase of the project.

The overall goal for environmental management for the proposed is to manage and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Facilitates harmonious co-existence between the project and other land uses in the area;
- Contributes to the environmental baseline and understanding of environmental impacts of Prospecting activities in a South African context.

The following environmental management objectives are recommended for the proposed mineral prospecting development and associated infrastructure:

- Monitor soils so as to avoid unnecessary erosion, and implement erosion control measures to preserve the quality of the soil for rehabilitation;
- Development planning must restrict the area of impact to minimum and designated areas only;
- Monitor and prevent contamination, and undertake appropriate remedial actions;
- Limit the visual and noise impact on receptors;
- Avoid impact on possible heritage and archaeological resources;
- Ensure that accurate information regarding the prospecting activities to be undertaken and the resultant lack of requirements for site access and labour is communicated to I&APs;
- Prevent the unnecessary destruction of, and fragmentation, of the vegetation community (including portions of a CBA1, CBA2 and surface water areas classed as High and Very High biodiversity importance);
- Adhere to an open and transparent communication procedure with stakeholders at all times;
- Enhance project benefits and minimise negative impacts through consultation with stakeholders;
- To limit interference with existing land uses as far as possible during prospecting;
- Limit the impact on the groundwater and surface water features through the implementation of the EMPr and the impact mitigation measures;
- Promote health and safety of workers; and
- Limit dust and other emissions to within allowable limits.

## **16 ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.**

*Any aspects which must be made conditions of the Environmental Authorisation*

Refer to Section 18.2 for aspects that should be included in the authorisation.



## **17 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.**

*(Which relate to the assessment and mitigation measures proposed)*

- A detailed site layout plan with location of drilling sites and trenches was not available, assumptions was thus made with regards to the location of potential access roads.
- No site visit was conducted by the specialists and available desktop information was used.

### **17.1 TERRESTRIAL ASSESSMENT**

The desktop study was conducted with up to date resources. It might however be possible that additional information become available in time, because environmental impact assessments deal with dynamic natural ecosystems. It is therefore important that the report be viewed and acted upon with these limitations in mind.

No field survey was conducted for the assessment and all results given within this document are based on desktop findings and assessments. Therefore, the results, typical flora, herpetofauna, avifauna and mammalian communities found within the study should/can therefore only be used as a general guideline.

The specialist responsible for this study reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light.

### **17.2 SOIL, LAND USE AND LAND CAPABILITY ASSESSMENT**

#### **Assumptions:**

- It is assumed that there are no alternative locations for the proposed activities and that the assessment, therefore, focussed only on the proposed prospecting application area.
- The prospecting activities will only take place in the focus areas as identified. The specific locations of the activities will be identified during phase 1 and the sensitivity of the specific locations will be assessed by the ECO to ensure that the impacts are kept to a minimal and no-go areas are avoided.
- The assessment was undertaken during the planning stage of the project and is based on the information available at that time.

#### **Limitations**

- This study was done only via desktop methodologies and no site assessment or in-field soil sampling took place.
- The study does not include a land contamination assessment to determine preconstruction soil pollution levels (should there be any present).

### **17.3 SURFACE WATER ASSESSMENT**

This report and assessment are based on available information as provided by Sylvania Northern Mining (Pty) Ltd Investments as outlined in Section 2.1 and throughout Section 5 of the Surface water report. No specific points for drilling / areas for trenching was provided thus assumptions with regards to access roads were made.

It is assumed that the information sourced from open source data is correct.

## **18 REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED**

### **18.1 REASONS WHY THE ACTIVITY SHOULD BE AUTHORIZED OR NOT.**

No fatal flaws were identified in terms of this project as long as the mitigation and recommendations proposed are adhered to. The impact assessment indicated no critical issues that cannot be lowered to

an acceptable level through the suggested mitigation measures, resulting in a fatal flaw. All sensitive areas identified throughout the process will be excluded from the proposed development.

It is recommended by the EAP that the proposed prospecting could be authorised, on the assumption that the environmental and social management commitments included in this BAR/EMPr and the Rehabilitation, Decommissioning and Mine Closure Plan are adhered to, the project description remains as per the description provided in this document and considering the positive social impacts associated with the project. It should also be ensured that proper rehabilitation is provided for and that risks are controlled by having emergency plans in place.

It is therefore the opinion of the EAP that the proposed activity should be authorised.

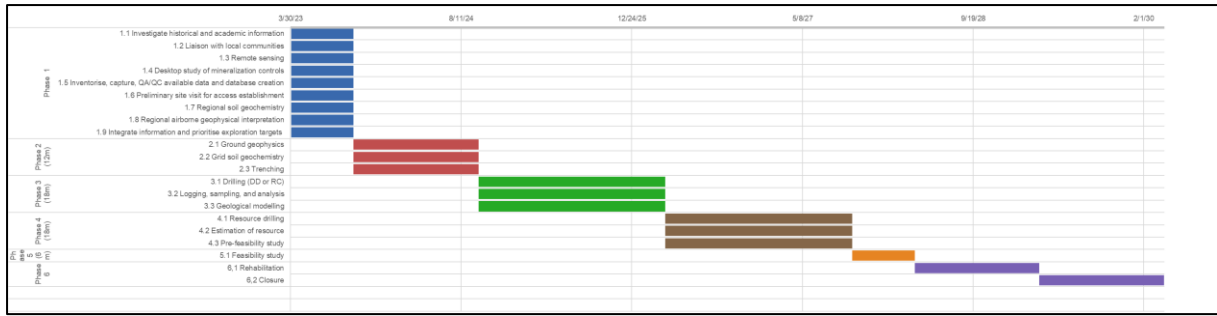
## **18.2 CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION**

Sylvania Northern Mining (Pty) Ltd should comply with all environmental legislations. Specific environmental legislation to be adhered to include; National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended in 2017 and Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)

- Notice must be given to communities, landowners and surrounding landowners 1 month prior to any prospecting activities being conducted on their areas of responsibility;
- Landowners and land occupiers should be engaged at least 1 month prior to any site activities being undertaken;
- Formal agreement between applicant and land owner to be in place before activities commence;
- A map detailing the sampling locations should be provided to the landowners as well as the DMRE prior to commencement of prospecting activities;
- Once the sampling locations have been finalised the site needs to be assessed by an Archaeologist and a Flora specialist to determine if there are heritage sites and protected trees that could be impacted by the proposed activities;
- A record must be kept of the implementation of the EMPr measures and monitoring of the efficiency of the implemented measures;
- An Environmental Control Officer should be appointed to do regular monitoring as suggested in the EMPr;
- In the unlikely event that graves are identified, these should be protected *in situ* and a 50 m buffer area should be applied where no prospecting activities may take place;
- All wetlands and watercourses should be protected *in situ* and no prospecting to take place within 100m from a watercourse or 500m from a wetland;
- Rehabilitation should take place immediately after work has ceased and should be done in a responsible manner; and
- Once rehabilitation has been completed the site needs to be assessed by a Flora specialist to determine that rehabilitation was done successfully and that no Alien invasive plant species are present.

## **19 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.**

The Prospecting Right has been applied for a period of five (5) years. The Environmental Authorisation should therefore allow for the five years of prospecting and an additional two (2) years for decommissioning and rehabilitation and the closure activities. An outline of the proposed timeline is provided below:



## 20 UNDERTAKING

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

The EAP undertakes that the information provided is correct, and that the comments and inputs from stakeholders and Interested and Affected parties have been correctly recorded in the report.

## 21 FINANCIAL PROVISION

*State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.*

The preliminary estimate of the rehabilitation cost is (inclusive of contingencies and VAT): **R R466 383,36.**

**Table 21-1: Quantum calculations**

Calculation of the Quantum							
<b>Applicant:</b> Sylvania Northern Mining (Pty) Ltd				<b>Reference:</b> LP30/5/1/1 /2/14710PR			
<b>EAP:</b> Dr Petro Erasmus				<b>Date:</b> 23/09/2022			
No	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master rate 2022	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines) - Vermiculite and SSP plant	m <sup>3</sup>	0	R17,84	1	1	R0,00
2 (A)	Demolition of steel buildings and structures (including floor slabs)	m <sup>2</sup>	0	R248,55	1	1	R0,00
2 (B)	Demolition of reinforced concrete buildings and structures (gate house, admin office, truckers ablution, clinic)	m <sup>2</sup>	0	R366,29	1	1	R0,00
3	Rehabilitation of access roads	m <sup>2</sup>	0	R44,48	1	1	R0,00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	R431,70	1	1	R0,00
4(B)	Demolition and rehabilitation of non-electrified railway lines	m	0	R235,47	1	1	R0,00
5	Demolition of housing/and or administration facilities	m <sup>2</sup>	20	R497,10	1	1	R9 942,10
6	Opencast rehabilitation including final voids and ramps	ha	0	R253 000,22	1	0,04	R0,00
7	Sealing of shafts adits and inclines	m <sup>3</sup>	0	R133,43	1	1	R0,00
8(A)	Rehabilitation of overburden and spoils	ha	0	R173 725,08	1	1	R0,00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	R216 371,44	1	1	R0,00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	R628 445,23	1	1	R0,00
9	Rehabilitation of subsided areas	ha	0	R145 468,59	1	1	R0,00
10	General surface rehabilitation, including grassing of all denuded areas	ha	2,0576	R137 619,56	1	1	R283 166,01
11	River diversions	ha	0	R137 619,56	1	1	R0,00
12	Fencing	ha	0	R156,98	1	1	R0,00
13	Water management	ha	0	R52 326,83	1	1	R0,00
14	2 to 3 years of maintenance and aftercare	ha	2,0576	R18 314,39	1	1	R37 683,69
15 (A)	Specialist study		0	R0,00	1	1	R0,00
15 (B)	Specialist study		1	R0,00	1	1	R0,00
<b>Sub Total 1 (Sum of items 1 to 15)</b>							<b>R330 791,80</b>
1	Preliminary and General	6% of Subtotal 1 if ≥ R 100 000 000		R39 695,02	<b>Weighting factor 2 (Step 4.4)</b>		
		12% of Subtotal 1 if ≤ R 1 000 000			1,05	R41 679,77	
2	Contingency		10.0% of Subtotal 1				R33 079,18
<b>Sub Total 2 (Sub Total 1 plus sum of management and contingency)</b>							<b>R405 550,75</b>
<b>VAT (15%)</b>							<b>R60 832,61</b>
<b>GRAND TOTAL (Subtotal 3 plus VAT)</b>							<b>R466 383,36</b>

**21.1 EXPLAIN HOW THE AFORESAID AMOUNT WAS DERIVED.**

The Regulations Pertaining to the Financial Provision for Prospecting, Mining or Production Operations promulgated under section 44(aE), (aF), (aG), (aH) read with sections 24(5)(b)(ix), 24(5)(d), 24N, 24P and 24R of the National Environmental Management Act, 1998 (Act No.107 of 1998) (20 November 2015) have been considered and this is anticipated to result in an increase in the rehabilitation costs estimated using above mentioned quantum.

The methodology as described in the 2005 DMR guideline was followed and the rates as contained therein was escalated on an annual basis.

The financial provisioning was determined using the following areas:

Farm	Borehole area (m <sup>2</sup> )	Trench Area (m <sup>2</sup> )	Road area (m <sup>2</sup> )	Impacted area (m <sup>2</sup> )
397	100	100	696	896
421	100	100	7192	7392
683	100	100	5396	5596
861	100	100	6492	6692

## 21.2 Confirm that this amount can be provided for from operating expenditure.

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

The Applicant has direct access to sufficient financial resources required as per the budget to enable it to conduct the proposed prospecting operation optimally in accordance with the Prospecting Work Program. The applicant has provided proof of financial ability during the application phase on the DMR SAMRAD system.

## 22 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

### 22.1 COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24 (3) (A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) THE EIA REPORT MUST INCLUDE THE: -

#### 22.1.1 Impact on the socio-economic conditions of any directly affected person.

*Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix 5.*

Confirmation was received from the Commission of Restitution of Land Rights (Limpopo) indicated that as per their database on the date of the letter that there were no land claims on Aurora 397 LR.

Land claims have been lodged for the following:

Property	Claimant	KRP(s)	Claim Status
Non Plus Ultra 683 LR	Bokoni Ba Mokerong	1906	Research Report Approved
Teneriffe 682 LR			
Portion 1 and RE of Nonnenwerth 421 LR	Bakoni ba Matlala a Thaba tribe	1756	
Gillemborg 861 LR	Mapela Tribe	1764	

The potential impact on the socio-economic aspects of the claimants during the proposed prospecting activities due to the non-invasive nature was determined as Low-Medium after the implementation of management measures. A positive impact will be the creation of temporary employment opportunities during the prospecting activities.

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

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

This BAR and EMPr has been compiled in accordance with the NEMA (1998), EIA Regulations (2014, amended April 2017) and MPRDA (2002). The EAP managing the application confirms that this BAR and EMPr is being submitted for Environmental Authorisation in terms of the National Environmental Management Act, 1998 in respect of listed activities that have been triggered by application in terms of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA) (as amended). Should the DMRE require any additional information, this will be provided upon request. No reasonable or feasible alternatives exist for this Prospecting Right Application and as such, motivation for no alternatives has been provided in the relevant sections above.



## PART B ENVIRONMENTAL MANGEMENT PROGRAMME REPORT

### 1 DETAILS OF EAP

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

The information is provided in Part A Section 1.

Name of the Practitioner: Prescali Environmental Consultants.

The report was compiled by Ms Obakeng Mokgatle.

Tel No.: 012 543 3808

Fax No. :086 621 0294

e-mail address: [info@prescali.co.za](mailto:info@prescali.co.za)

### 2 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

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

The requirement to describe the aspects of the activity that are covered by the final environmental management programme is already included in Part A Section 4.

### 3 COMPOSITE MAP

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

Refer to Figure 14-1, Figure 14-2 and Appendix 4.

## 4 DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

### 4.1 DETERMINATION OF CLOSURE OBJECTIVES.

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

Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must consider the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

- Rehabilitation of areas disturbed as a consequence of prospecting to a land capability that will support and sustain a predetermined post-closure land use especially for the high sensitivity agriculture areas as identified;
- Removal of all infrastructure/equipment that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use;
- Removal of existing contaminated material from affected areas;
- Establishment of final landforms that are free-draining, stable and safe in the long run; and
- Establishment and implementation of measures that meet specific closure related performance objectives.

### 4.2 VOLUMES AND RATE OF WATER USE REQUIRED FOR THE OPERATION.

*Water use will be required for the prospecting work programme.*

It is not foreseen that any water will be needed for the activities other than potable water for the employees.

#### **4.3 HAS A WATER USE LICENCE HAS BEEN APPLIED FOR?**

It is not anticipated that a water use licence will be needed at this point in time based on the location of the proposed prospecting boreholes and trenches.



## 5 IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

*Measures to rehabilitate the environment affected by the undertaking of any listed activity.*

The identified mitigation measures for the identified impacts are outlined in the table below.

**Table 5-1: Mitigation measures**

Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Topography	All prospecting activities	Impact on topography that result in water ponding - area not free draining	During rehabilitation make sure that impacted area is free draining,	N/A	During Rehabilitation
Geology	All prospecting activities	Sterilisation of mineral resource as a result of prospecting activities.	None	N/A	None
Groundwater	All prospecting activities	Impact on groundwater quality as a result of hydrocarbon spills from machinery.	Remove contaminated soil as soon as incident occur. Dispose contaminated soil and suitable landfill site. Keep safe disposal certificates. Place drip trays / plastic liner with soil cover underneath parked machinery / vehicles.	SANS214:2015 DWAf: Domestic water quality guidelines	Continuous
Groundwater	All prospecting activities	Impact on groundwater levels	Should groundwater be found during the prospecting phase (especially borehole drilling) the depth of the water table should be recorded and a water sample needs to be submitted for analyses to an accredited laboratory.	N/A	Continuous
Air quality	All prospecting activities	Dust generated as a result of the prospecting activities including travelling on road could impact on local PM10 levels.	Keep travel speeds on provincial / regional roads to the prescribed speed limit. For site access roads keep speed limit to below 60 km/hr. For the topsoil heaps created by the trenching activities cover the topsoil stockpile with tarps or implement dust suppression.	Regional Air quality limits SANS 1929: 2005	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Nosie	All prospecting activities	The operation of machinery could result in increased noise levels in an area that is rural in nature. This noise could become a nuisance to the residents.	Keep travel speeds on provincial / regional roads to the prescribed speed limit. Conduct prospecting activities during daylight hours (07h00 - 17h00).	ECA Noise regulations SANS 10103:2008	Continuous
Socio-Economic	All prospecting activities	(+) Very few employment opportunities will be created during prospecting. However, it is anticipated that a few (<10) could be created that will result in a positive economic impact.	N/A	N/A	None
Socio-Economic	All prospecting activities	The proposed prospecting activities could create awareness of the area by people seeking employment and result in people moving to the area in case of future employment opportunities should the mineral be viable for full scale mining. This could negatively affect the existing social aspects of the area and impact on the sustainability of services such as schools, clinics, police etc.	Open channels with the local communities, ward councillor and tribal authorities must be maintained. This will ensure that their needs and expectations are taken into consideration during all phases of the prospecting activities and should inform the impact assessment and social and labour plan should full scale mining be viable.	N/A	Continuous
Surface water quality	Ground geophysics and soil geochemical sampling - Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Clear vegetation only if needed and if no alternative site is available close by.	SANS214:2015 DWF: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Ground geophysics and soil geochemical sampling - Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Conduct sampling in dry season as far as possible.	SANS214:2015 DWF: Domestic water quality guidelines	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
				Reserve determination	
Surface water quality	Ground geophysics and soil geochemical sampling - Topsoil stockpiling/Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Place a tarp over topsoil stockpile during windy conditions.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Ground geophysics and soil geochemical sampling - Replace topsoil	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	If possible wet topsoil once off to assist with vegetations establishment and to reduce dust generation.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Ground geophysics and soil geochemical sampling - Replace topsoil	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	If possible wet topsoil once off to assist with vegetations establishment and to reduce dust generation.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Trenching - Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Conduct sampling in dry season as far as possible.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	Continuous
Surface water quality	Trenching -Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat,	Conduct sampling in dry season as far as possible.	SANS214:2015 DWAf: Domestic water quality guidelines	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
		flow regime and the physico & chemical quality of the water in the watercourse.		Reserve determination	
Surface water quality	Trenching - Topsoil stockpiling/Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	If stockpiles will be in use for more than 1 month, see if vegetation can be established. Implement dust suppression during high wind times.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	Continuous
Surface water quality	Trenching - Overburden stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Conduct sampling in dry season as far as possible.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	Continuous
Surface water quantity	Trenching - Containment of rainwater in trench	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	Place overburden stockpiles on the upstream side of the trench to prevent storm water ingress into the trench. Conduct trenching in the dry season as far as possible.	Reserve determination	Continuous
Surface water quality	Trenching - Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Clean any spills immediately and place in special marked bag for hazardous waste. Dispose hazardous waste at registered landfill site. Keep safe disposal certificates on file.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Trenching - Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	Maintain chemical toilets. Clean up any spills immediately and place in special marked bag for hazardous waste. Dispose hazardous waste at registered landfill site.	SANS214:2015 DWAf: Domestic water quality guidelines	As needed



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
			Keep safe disposal certificates on file.	Reserve determination	
Surface water quality	Trenching - General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	Have a waste bag on site that can be kept in one of the vehicles and dispose all general waste therein. Remove daily from site. Dispose at suitable landfill site / of the volume is little dispose in a local waste bin / skip.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	Continuous
Surface water quality	Resource drilling: drill pad and sump - Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Clean any spills immediately and place in special marked bag for hazardous waste. Dispose hazardous waste at registered landfill site. Sub-soil under drill rig to be protected by either spill kits under it / placement of PVD material topped with soil that can be removed if contaminated. Keep safe disposal certificates on file.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Resource drilling: drill pad and sump - Drilling sludge	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Contain sludge in a suitably constructed area.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Resource drilling: drill pad and sump - Vegetation removal & General activities	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Only clear area that is needed. If dust is noted during high winds implement dust suppression.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Surface water quality	Resource drilling: drill pad and sump - Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Only clear area that is needed. Conduct activity in dry season.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	Continuous
Surface water quantity	Resource drilling: drill pad and sump - Operation of drill pad sump	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	Ensure that sludge is contained.	Reserve determination	Continuous
Surface water quality	Resource drilling: drill pad and sump - Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	Maintain chemical toilets. Clean up any spills immediately and place in special marked bag for hazardous waste. Dispose hazardous waste at registered landfill site. Keep safe disposal certificates on file.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Resource drilling: drill pad and sump - Capping of Borehole	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Conduct activity in dry season.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	Continuous
Surface water quality	Resource drilling: drill pad and sump - Rip impacted area	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Conduct activity in dry season.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Surface water quality	Resource drilling: drill pad and sump - Rip impacted area	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Wet affected area to assist with vegetation establishment and to reduce potential for dust generation in the short term.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Resource drilling: drill pad and sump - General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	Have a waste bag on site that can be kept in one of the vehicles and dispose all general waste therein. Remove daily from site. Dispose at suitable landfill site / of the volume is little dispose in a local waste bin / skip.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	Continuous
Surface water quality	Access road - Vegetation removal (all access roads combined)	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Clean any spills immediately and place in special marked bag for hazardous waste. Dispose hazardous waste at registered landfill site. Keep safe disposal certificates on file.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Access road Daily travelling to prospecting site	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Implement dust suppression if complaints are received. Implement speed limit suitable to access road and as prescribed by existing provincial road notices.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed
Surface water quality	Access road Daily travelling to prospecting site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Clean any spills immediately and place in special marked bag for hazardous waste. Dispose hazardous waste at registered landfill site. Keep safe disposal certificates on file.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Surface water quality	Access road Rip road area	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Wet affected area to assist with vegetation establishment and to reduce potential for dust generation in the short term.	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination	As needed
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on open-air Stone Age sites that could be found in the area, most likely in the form of individual stone tools or small scatters. The possibility of Iron Age sites (especially stone-walled Late Iron Age sites) in the areas can also not be excluded, although this is less likely	Before setting final drilling and trenching locations (as well as access roads) an archaeologist must conduct a site assessment to confirm the presence of any sites of importance. Any sites of importance should be avoided, a 50 m buffer is recommended.	No impacts on important sites	Continuous
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on Iron Age sites (especially stone-walled Late Iron Age sites) although this is less likely than Stone Age sites.	Before setting final drilling and trenching locations (as well as access roads) an archaeologist must conduct a site assessment to confirm the presence of any sites of importance. Any sites of importance should be avoided, a 50 m buffer is recommended.	No impacts on important sites	Continuous
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on recent historical sites and features as the possibility of their presence the area is High, and will most be represented by the remnants of individual homesteads and rural settlements.	Before setting final drilling and trenching locations (as well as access roads) an archaeologist must conduct a site assessment to confirm the presence of any sites of importance. Any sites of importance should be avoided, a 50 m buffer is recommended.	No impacts on important sites	Continuous





Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on both formal & informal cemeteries, individual graves and even previously unknown & unmarked graves.	Before setting final drilling and trenching locations (as well as access roads) an archaeologist must conduct a site assessment to confirm the presence of any sites of importance. Delineate boundaries of any graves / cemeteries / graveyards identified during the site inspection by the archaeologist. No activities to be conducted within 50 m from the boundary of any grave, cemetery, graveyard.	No impacts on important sites	Continuous
Terrestrial biodiversity	Development activities Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities will lead to destruction and damage of habitats and vegetation communities and overall loss of biodiversity and ecosystem function within the clearance and operational area. Destruction of habitat may lead to faunal species migrating to other more favourable areas.	The vegetation removal should be controlled, very specific and the clearance area kept as small as possible. A control of access should be implemented for all remaining natural areas to prevent unnecessary destruction of habitats or disturbance of species. It is also vital that no unnecessary fragmentation occurs and that all roads are clearly demarcated and kept to without any exceptions. No vehicles or personnel are permitted outside of these demarcated roads. To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled. Continuous rehabilitation of the area should occur, where infilling of trenches and replacement of topsoil should be prioritised.	Maintain terrestrial biodiversity and comply the EMPr management requirements.	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Terrestrial biodiversity	Development activities Drilling, Roads, Trenching and geochemical sampling	The continuous human activity over a longer-term period may further impact on the faunal communities within the area. Associated noise, waste, the smell of humans and physical infiltration into remaining natural areas are problematic and may lead to declining populations (where the disturbance of habitat has caused habitat remaining to become unfavourable).	Animals may get used to movement by people in designated areas if the it is predictable. A control of access should be implemented for all remaining natural areas to prevent infiltration of remaining natural habitats or disturbance of species. To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with. Prevent impacts and waste from reaching the surface water systems and areas outside the footprint areas. Hazardous wastes should be stored in impermeable and bunded areas. Domestic waste and other waste should be managed in the appropriate manner and apply good housekeeping practices will aid this issue. Adequate waste storage and disposal must be implemented at the development. Littering must be prevented and regularly cleaned up and form part of good housekeeping practices to be implemented around site. Ensure awareness amongst all staff, contractors and visitors to site to not needlessly harm or hinder animals or damage flora. No additional fragmentation should occur and all roads should be	Maintain terrestrial biodiversity and comply the EMPr management requirements. SANAS Waste management requirements	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
			<p>clearly demarcated and kept to without any exceptions and within the proposed footprints where possible.</p> <p>All footprint areas should remain as small as possible.</p> <p>The vegetation removal should be controlled and should be very specific.</p> <p>It is vital that if any SCC occurs on the proposed site that these species should be protected and/or left undisturbed as far as possible. Only as an exception can these species be relocated to favourable sites with the use of a specialist prior to vegetation and habitat removal. If at any point any SCC is encountered, a specialist should be consulted as to determine the best way forward and a permit should be obtained if any intervention is required.</p> <ul style="list-style-type: none"><li>• Prior to finalisation of the activities and closure, an AIP survey must be undertaken to determine whether AIP are present in and around the project footprint.</li><li>• Rehabilitation plans should be planned long before the closure phase is due. Continuous rehabilitation should also take place during the operational phase, with infilling of trenches and replacement of topsoil being the priority.</li></ul>		



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
			<ul style="list-style-type: none"> <li>• Ensure that an acceptable aesthetic scenario is created post closure.</li> <li>• When closure is considered successful and rehabilitation complete, unnecessary fences/barriers should be lifted to restore larger foraging areas.</li> <li>• Re-vegetation of all degraded areas and bare patches is advised to speed recovery to natural, self-sustaining state as soon as possible.</li> </ul>		
Terrestrial biodiversity	Development activities Vegetation clearance	Vegetation clearance will destroy indigenous vegetation and lead to possible invasive and/or exotic species establishing in the area and edge-effects occurring surrounding the prospecting activities. Bare areas may become vulnerable to Alien and Invasive Plant species and these may compete with indigenous species, likely leading to the migration of sensitive species from the site to a more favourable habitat.	<p>Alien Invasive Plant (AIP) control measures should be implemented for the control of invasive and exotic plant species. Sensitive watercourses and associated riparian zone habitats constitute the most important features which make up the area identified as increased sensitivity. Invasive prospecting activities should be planned to keep clear of these zones.</p> <p>A survey for protected tree species on the clearance footprint should be undertaken by a suitably qualified specialist prior to the start of construction / clearance. Based on the findings of the survey, the relevant permits, if applicable, for each protected tree species identified within the proposed clearance footprint, which may be</p>	Maintain terrestrial biodiversity and comply the EMPr management requirements. No increase in AIP species and density.	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
			damaged or destroyed, should be applied for		
Terrestrial biodiversity	Development activities Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities may impact on areas designated as high sensitivity, including critical biodiversity areas and watercourses situated in and around the Prospecting Right area. The majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 are located on areas categorised as CBA. The layout of the prospecting target areas appear to have been designed to avoid most of the non-perennial tributaries. The activity may lead to the loss of species of conservation concern. Based on the desktop study findings, no flora SCC are considered to be likely to occur on the project area. However, fifteen (15) faunal species previously recorded in the area queried are categorised as SCC.	The vegetation removal should be controlled, very specific and the clearance area kept as small as possible. If any SCC are encountered within the subject property in the future, the following should be ensured: o If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas or within designated open space on the subject property. o All rescue and relocation plans should be overseen by a suitably qualified specialist. o Obtain relevant permits/consent, if applicable, for each protected or endangered floral species identified within the proposed development area that will be destroyed. Placement of the infrastructure and activities should be planned to avoid sensitive areas such as CBAs and rivers and streams.	Maintain terrestrial biodiversity and comply the EMPr management requirements. No increase in AIP species and density.	Continuous
Terrestrial biodiversity	Development activities Rehabilitation	Rehabilitation could be ineffective if rehabilitation actions are not effectively implemented. Without the necessary mitigation measures, rehabilitation will be less successful and the ecology of the impacted areas may not recover to a pre-prospecting state. Without mitigation the alien invasive species may increase and result in a degraded veld condition making the	Alien Invasive Plant (AIP) control measures should be implemented for the control of invasive and exotic plant species. Prior to finalisation of the activities and closure, an AIP survey must be undertaken to determine whether AIP are present in and around the project footprint. Rehabilitation plans should be	Maintain terrestrial biodiversity and comply the EMPr management requirements. No increase in AIP species and density.	Continuous



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
		property less viable for post-closure land use activities such as wilderness, grazing and agriculture.	planned long before the closure phase is due. Continuous rehabilitation should also take place during the operational phase, with infilling of trenches and replacement of topsoil being the priority.	Final site assessment after rehabilitation is finalised.	
Soil, Land Use and Land Capability	All Soil stripping	Soil Erosion	Land clearance must only be undertaken within the prospecting footprint. Follow adequate soil stripping guidelines. Unnecessary land clearance must be avoided. Only the designated access routes are to be used. The Stormwater Management measures to be implemented where required Any loss in production or agricultural potential to be compensated where applicable. Revegetate cleared areas as soon as possible after site establishment. Keep the project footprint as small as possible.	EMPr GN704	During construction
Soil, Land Use and Land Capability	All Vehicles driving on the soil surface	Compaction and loss of soil structure			
Soil, Land Use and Land Capability	All Spillages of hydrocarbons	Soil pollution and contamination			
Soil, Land Use and Land Capability	All Soil stripping	Soil Erosion	Current land use practices should not be impacted by proposed activities. All proposed activities must take place on the outer edges of current land use practices, 500 m from any wetlands and 100 m from any rivers or riparian habitats. Main mitigation of the expected	EMPr GN704	Continuous
Soil, Land Use and Land Capability	All Soil Stripping / Trenching and Drilling	Dilution of topsoil through mixing with subsoil; Loss of topsoil as a resource			



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Soil, Land Use and Land Capability	All Soil Stripping / Trenching and Drilling	Decline in organic matter & biological activity	<p>impacts will consist of compensation to the farmer equivalent to the possible loss of agricultural income and food security.</p> <p>Follow adequate stripping guidelines.</p> <p>Unnecessary land clearance must be avoided.</p> <p>Topsoil should be stripped by means of an excavator bucket and loaded onto dump trucks.</p> <p>If possible, topsoil should be stripped when soil is dry, as to reduce compaction.</p> <p>Ensure topsoil is stored in dedicated stockpiles, 5 m high and away from drainages lines and surface water.</p> <p>Soil stockpiles must be dampened with dust suppressant or equivalent.</p> <p>Soil stockpiles must be located away from any waterway or preferential water flow path in the landscape, to minimise soil erosion from these.</p> <p>The Stormwater Management measures should provide for a drainage system sufficiently designed to prevent water run-off which will cause soil erosion.</p> <p>Revegetate cleared areas, which will not form part of operational areas, as soon as possible.</p> <p>Only the designated access routes</p>		
Soil, Land Use and Land Capability	All Soil Stripping / Trenching and Drilling	Loss of water holding capacity			
Soil, Land Use and Land Capability	All Vehicles driving on the soil surface	Compaction and loss of soil structure			
Soil, Land Use and Land Capability	All Soil Stripping / Trenching and Drilling	Loss of land capability and land use			
Soil, Land Use and Land Capability	All Spills from vehicles, accidental spills of hazardous chemicals	Soil pollution and contamination			



Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
			<p>are to be used.            Stockpiles are to be maintained in a fertile and erosion free state.            High level maintenance must be undertaken on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills.            Spills of fuel and lubricants from vehicles and equipment must be contained using a drip tray with plastic sheeting filled with adsorbent material.            Spill kits should be available on site and should be serviced regularly.            Waste disposal at the site and during operation must be avoided by separating, trucking out and recycling of waste.            Potentially contaminating fluids and other wastes must be contained in containers stored on hard surface levels in bunded locations.            Accidental spillage of potentially contaminating liquids and solids must be cleaned up immediately by trained staff with the correct equipment and protocols.            Concurrent rehabilitation and re-vegetation of the excavated areas should take place.</p>		
Soil, Land Use and Land Capability	All Stockpiling of Soil	Loss of Topsoil as a Resource: Compaction and Erosion	All trenches and drill sites must be backfilled and rehabilitated. Backfill should be done in such a manner that topsoil is not mixed	EMPr	During Rehabilitation





Aspect	Activity	Impact	Mitigation Measures	Compliance with Standards	Time period for implementation
Soil, Land Use and Land Capability	All Backfilling of soil material layers	Loss of land capability	with subsoil or material containing rocks. Deep rip compacted areas to allow for natural vegetation regrowth. Ensure proper storm water management designs are in place. Soils must be replaced according to the soil types. Compaction of the topsoil should be avoided. Post-closure monitoring and maintenance to be undertaken. Area to be rehabilitated, re-vegetated and soil amelioration to be undertaken. Contour slopes to minimise erosion and run-off.		
<b>Cumulative impacts</b>					
Surface water quality	Prospecting activities (all) Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quality as a result of hydrocarbon spills and siltation from run-off.	Implement as above. Conduct prospecting activities consecutively and rehabilitate areas immediately after the prospecting activities have been finalised and is moved to the next area.	SANS214:2015 DWAf: Domestic water quality guidelines Reserve determination	Continuous
Surface water quantity	Prospecting activities (all) Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quantity; however, it is expected that the boreholes and trenching will be done consecutively thus the impact severity should not increase from that of the individual activities.	Implement as above. Conduct prospecting activities consecutively and rehabilitate areas immediately after the prospecting activities have been finalised and is moved to the next area.	Reserve determination	Continuous
Surface water quality	Prospecting activities (all)	During the rehabilitation phase water quality could be impacted as a result of hydrocarbon spills and from siltation	Implement as above. Conduct prospecting activities consecutively and rehabilitate areas	SANS214:2015 DWAf: Domestic water	Continuous



<b>Aspect</b>	<b>Activity</b>	<b>Impact</b>	<b>Mitigation Measures</b>	<b>Compliance with Standards</b>	<b>Time period for implementation</b>
	Cumulative impact: Big area (Areas 1, 2, 3 and 4)	from ripped areas that are not vegetated.	immediately after the prospecting activities have been finalised and is moved to the next area.	quality guidelines Reserve determination	
Soil, Land Use and Land capability	Prospecting activities (all) Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The impact on the local food security on the areas where prospecting activities will take place, will be moderate as the capacity of the area to sustain large number of grazing animals is moderate and high for subsistence farming. With the expected soil degradation occurring and most areas proposed for prospecting overlapping with high subsistence farming potential, a decline in the overall soil quality and health is expected and may hinder the future land use for grazing and crop production on the areas where prospecting will take place.	As per Soil and Land Use in previous table	As per Soil and Land Use above	As per Soil and Land Use above

## 6 IMPACT MANAGEMENT ACTIONS AND OUTCOMES

Identified impacts managements and anticipated outcomes are provided in the Table below.

**Table 6-1: Summary of Impact Management Actions and Outcomes**

Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
Topography	All prospecting activities	Impact on topography that result in water ponding - area not free draining	Management	Free draining area
Geology	All prospecting activities	Sterilisation of mineral resource as a result of prospecting activities.	None	N/A
Groundwater	All prospecting activities	Impact on groundwater quality as a result of hydrocarbon spills from machinery.	Management	SANS214:2015 DWAF: Domestic water quality guidelines
Groundwater	All prospecting activities	Impact on groundwater levels	Management	N/A
Air quality	All prospecting activities	Dust generated as a result of the prospecting activities including travelling on road could impact on local PM10 levels.	Management	Regional Air quality limits SANS 1929: 2005
Noise	All prospecting activities	The operation of machinery could result in increased noise levels in an area that is rural in nature. This noise could become a nuisance to the residents.	Management	ECA Noise regulations SANS 10103:2008
Socio-Economic	All prospecting activities	(+) Very few employment opportunities will be created during prospecting. However, it is anticipated that a few (<10) could be created that will result in a positive economic impact.	None	None
Socio-Economic	All prospecting activities	The proposed prospecting activities could create awareness of the area by people seeking employment and result in people moving to the area in case of future employment opportunities should the mineral be viable for full scale mining. This could negatively affect the existing social aspects of the area and impact on the sustainability of services such as schools, clinics, police etc.	Management	N/A
Surface water quality	Ground geophysics and soil geochemical sampling	Silt generation during rainfall events could reach surface water resources result in in siltation of the	Management	SANS214:2015 DWAF: Domestic



Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
	Vegetation removal	watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.		water quality guidelines Reserve determination
Surface water quality	Ground geophysics and soil geochemical sampling Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Ground geophysics and soil geochemical sampling Topsoil stockpiling/Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Ground geophysics and soil geochemical sampling Replace topsoil	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Ground geophysics and soil geochemical sampling Replace topsoil	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Trenching Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Trenching Topsoil stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Trenching Topsoil stockpiling/Vegetation removal & General activities	Dust generated from stockpile areas could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Management	SANS214:2015 DWAF: Domestic water quality



Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
				guidelines Reserve determination
Surface water quality	Trenching Overburden stockpiling	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quantity	Trenching Containment of rainwater in trench	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	Management	Reserve determination
Surface water quality	Trenching Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Trenching Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Trenching General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Resource drilling: drill pad and sump Heavy machinery equipment on site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Resource drilling: drill pad and sump Drilling sludge	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination



Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
Surface water quality	Resource drilling: drill pad and sump Vegetation removal & General activities	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Management Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Resource drilling: drill pad and sump Vegetation removal	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Management Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quantity	Resource drilling: drill pad and sump Operation of drill pad sump	Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	Management	Reserve determination
Surface water quality	Resource drilling: drill pad and sump Chemical toilets and sewage waste management	Contamination from spills from chemical toilets could impact on water quality should the spilled material enter any watercourse and this could impact on the biota.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Resource drilling: drill pad and sump Capping of Borehole	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Resource drilling: drill pad and sump Rip impacted area	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Resource drilling: drill pad and sump Rip impacted area	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination



Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
Surface water quality	Resource drilling: drill pad and sump General waste generation	General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Access road Vegetation removal (all access roads combined)	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Access road Daily travelling to prospecting site	Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Access road Daily travelling to prospecting site	Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quality	Access road Rip road area	Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Management	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on open-air Stone Age sites that could be found in the area, most likely in the form of individual stone tools or small scatters. The possibility of Iron Age sites (especially stone-walled Late Iron Age sites) in the areas can also not be excluded, although this is less likely	Management Planning	No impacts on important sites
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on Iron Age sites (especially stone-walled Late Iron Age sites) although this is less likely than Stone Age sites.	Management Planning	No impacts on important sites



Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on recent historical sites and features as the possibility of their presence the area is High, and will most be represented by the remnants of individual homesteads and rural settlements.	Management Planning	No impacts on important sites
Heritage and archaeological	Prospecting activities (all) Drilling, Roads, Trenching and geochemical sampling	The proposed prospecting activities could impact on both formal & informal cemeteries, individual graves and even previously unknown & unmarked graves.	Management Planning	No impacts on important sites
Terrestrial biodiversity	Development activities Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities will lead to destruction and damage of habitats and vegetation communities and overall loss of biodiversity and ecosystem function within the clearance and operational area. Destruction of habitat may lead to faunal species migrating to other more favourable areas.	Management Planning	Maintain terrestrial biodiversity and comply the EMPr management requirements.
Terrestrial biodiversity	Development activities Drilling, Roads, Trenching and geochemical sampling	The continuous human activity over a longer-term period may further impact on the faunal communities within the area. Associated noise, waste, the smell of humans and physical infiltration into remaining natural areas are problematic and may lead to declining populations (where the disturbance of habitat has caused habitat remaining to become unfavourable).	Management Planning	Maintain terrestrial biodiversity and comply the EMPr management requirements. SANAS Waste management requirements
Terrestrial biodiversity	Development activities Vegetation clearance	Vegetation clearance will destroy indigenous vegetation and lead to possible invasive and/or exotic species establishing in the area and edge-effects occurring surrounding the prospecting activities. Bare areas may become vulnerable to Alien and Invasive Plant species and these may compete with indigenous species, likely leading to the migration of sensitive species from the site to a more favourable habitat.	Management Planning	Maintain terrestrial biodiversity and comply the EMPr management requirements. No increase in AIP species and density.
Terrestrial biodiversity	Development activities Drilling, Roads, Trenching and geochemical sampling	Invasive prospecting and associated activities may impact on areas designated as high sensitivity, including critical biodiversity areas and watercourses situated in and around the	Management Planning	Maintain terrestrial biodiversity and comply the EMPr management





Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
		<p>Prospecting Right area. The majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 are located on areas categorised as CBA. The layout of the prospecting target areas appear to have been designed to avoid most of the non-perennial tributaries.</p> <p>The activity may lead to the loss of species of conservation concern. Based on the desktop study findings, no flora SCC are considered to be likely to occur on the project area. However, fifteen (15) faunal species previously recorded in the area queried are categorised as SCC.</p>		<p>requirements. No increase in AIP species and density.</p>
Terrestrial biodiversity	Development activities Rehabilitation	Rehabilitation could be ineffective if rehabilitation actions are not effectively implemented. Without the necessary mitigation measures, rehabilitation will be less successful and the ecology of the impacted areas may not recover to a pre-prospecting state. Without mitigation the alien invasive species may increase and result in a degraded veld condition making the property less viable for post-closure land use activities such as wilderness, grazing and agriculture.	Management Planning	Maintain terrestrial biodiversity and comply the EMPr management requirements. No increase in AIP species and density. Final site assessment after rehabilitation is finalised.
Soil, Land Use and Land Capability	All: Soil stripping	Soil Erosion	Management Planning	Maintain terrestrial biodiversity and comply the EMPr management requirements. No increase in AIP species and density. Final site assessment after rehabilitation is finalised.
Soil, Land Use and Land Capability	All: Vehicles driving on the soil surface	Compaction and loss of soil structure		
Soil, Land Use and Land Capability	All: Spillages of hydrocarbons	Soil pollution and contamination		
Soil, Land Use and Land Capability	All: Soil stripping	Soil Erosion	Management Planning	Maintain terrestrial biodiversity and



Aspect	Activity	Impact	Mitigation Type	Standard to be achieved
Soil, Land Use and Land Capability	All: Soil Stripping / Trenching and Drilling	Dilution of topsoil through mixing with subsoil; Loss of topsoil as a resource		comply the EMPr management requirements. No increase in AIP species and density. Final site assessment after rehabilitation is finalised.
Soil, Land Use and Land Capability	All: Soil Stripping / Trenching and Drilling	Decline in organic matter & biological activity		
Soil, Land Use and Land Capability	All: Soil Stripping / Trenching and Drilling	Loss of water holding capacity		
Soil, Land Use and Land Capability	All: Vehicles driving on the soil surface	Compaction and loss of soil structure		
Soil, Land Use and Land Capability	All: Soil Stripping / Trenching and Drilling	Loss of land capability and land use		
Soil, Land Use and Land Capability	All: Spills from vehicles, accidental spills of hazardous chemicals	Soil pollution and contamination		
Soil, Land Use and Land Capability	All: Stockpiling of Soil	Loss of Topsoil as a Resource: Compaction and Erosion	Management Planning	Maintain terrestrial biodiversity and comply the EMPr management requirements. No increase in AIP species and density. Final site assessment after rehabilitation is finalised.
Soil, Land Use and Land Capability	All: Backfilling of soil material layers	Loss of land capability		
<b>Cumulative impacts</b>				
Surface water quality	Prospecting activities (all): Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quality as a result of hydrocarbon spills and siltation from run-off.	Management Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Surface water quantity	Prospecting activities (all): Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The proposed prospecting activities could impact on surface water quantity; however, it is expected that the boreholes and trenching will be done consecutively thus the impact severity should not increase from that of the individual activities.	Management Planning	Reserve determination



<b>Aspect</b>	<b>Activity</b>	<b>Impact</b>	<b>Mitigation Type</b>	<b>Standard to be achieved</b>
Surface water quality	Prospecting activities (all): Cumulative impact: Big area (Areas 1, 2, 3 and 4)	During the rehabilitation phase water quality could be impacted as a result of hydrocarbon spills and from siltation from ripped areas that are not vegetated.	Management Planning	SANS214:2015 DWAF: Domestic water quality guidelines Reserve determination
Soil, Land Use and Land capability	Prospecting activities (all): Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The impact on the local food security on the areas where prospecting activities will take place, will be moderate as the capacity of the area to sustain large number of grazing animals is moderate and high for subsistence farming. With the expected soil degradation occurring and most areas proposed for prospecting overlapping with high subsistence farming potential, a decline in the overall soil quality and health is expected and may hinder the future land use for grazing and crop production on the areas where prospecting will take place.	Management Planning	As above
Terrestrial biodiversity	Prospecting activities (all): Cumulative impact: Big area (Areas 1, 2, 3 and 4)	The prospecting activity could impact on the fauna and Flora biodiversity of the area and result in increased AIPs infestation.	Management Planning	As above

## 7 FINANCIAL PROVISION

### 7.1 DETERMINATION OF THE AMOUNT OF FINANCIAL PROVISION.

On the 20<sup>th</sup> of November 2015 the Minister promulgated the Financial Provisioning Regulations under the NEMA, which will come into effect in 2022. The regulations aim to regulate the determine and making of financial provision as contemplated in the NEMA for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, prospecting, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, *inter alia*:

- Determination of financial provision: An applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, prospecting, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts.
- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:
  - Annual rehabilitation – annual rehabilitation plan
  - Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan; and
  - Remediation of latent defects.
- Regulation 10: An applicant must:
  - Ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the MPRDA; and
  - Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, prospecting, mining or production operations.
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA regulations.

Please refer to Section 21 in Part A.

### 7.2 DESCRIBE THE CLOSURE OBJECTIVES AND THE EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE BASELINE ENVIRONMENT DESCRIBED UNDER THE REGULATION.

Considering the relatively limited impact of the proposed prospecting activities, the closure objectives are aimed at re-instating the landform, land use and vegetation units to the same as before prospecting operations take place unless a specific, reasonable alternate land use is requested by the landowner / lawful occupier. As such, the intended end use for the disturbed prospecting areas and the closure objectives will be defined in consultation with the relevant landowner / occupier. The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to prospecting. This shall be achieved with a number of specific objectives.

- i. **Making the area safe.** i.e., Decommission prospecting activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, sealing boreholes, etc.



- ii. **Recreating a free draining landform.** This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.
- iii. **Re-vegetation.** This involves either reseeding or allowing natural succession depending on the area, climate etc.
- iv. **Storm water management and erosion control.** Management of stormwater and prevention of erosion during rehabilitation. E.g. cut off drains, berms etc. and erosion control where required.
- v. **Verification of rehabilitation success.** Entails monitoring of rehabilitation.
- vi. **Successful closure.** Obtain closure certificate.

## **8 CONFIRM SPECIFICALLY THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNER AND INTERESTED AND AFFECTED PARTIES.**

The environmental objectives in relation to closure was consulted with the interested and affected parties as this document was made available for comment. It should be considered that should the prospecting yield negative results, then the end use for area will revert to its pre-prospecting land use (minutes to be incorporated on the final report). The end-use of the area will therefore not be changed by the prospecting operations.

## **9 PROVIDE A REHABILITATION PLAN THAT DESCRIBES AND SHOWS THE SCALE AND AERIAL EXTENT OF THE MAIN PROSPECTING ACTIVITIES, INCLUDING THE ANTICIPATED PROSPECTING AREA AT THE TIME OF CLOSURE.**

The following main strategies will be implemented:

- Rehabilitation of areas disturbed as a consequence of prospecting to a land capability that will support and sustain a predetermined post-closure land use;
- Removal of all infrastructure/equipment that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use;
- Removal of existing contaminated material from affected areas;
- Establishment of final landforms that are stable and safe in the long run;
- Establishment and implementation of measures that meet specific closure related performance objectives.

### **9.1 INTEGRATED REHABILITATION AND CLOSURE PLAN**

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

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

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



It is noted that a separate application for environmental authorisation must be submitted for closure in accordance with EIA Regulations, 2014 Listing Notice 1 Activity 22:

The decommissioning of any activity requiring

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

The above closure application was submitted as part of the Environmental authorisation, refer to Part A Table 5-1: Listed Activities as well as the proposed timeframe for the authorisation in Part A Section 19.

## **9.2 PHASE 1: MAKING SAFE**

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

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

All backfilled trenches will be levelled, a follow up visit should be made one year after backfilling to determine if additional backfilling is needed in the event of subsidence.

## **9.3 PHASE 2: LANDFORM DESIGN, EROSION CONTROL AND REVEGETATION**

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

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



#### **9.4 PHASE 3: MONITORING AND MAINTENANCE**

The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority. The monitoring activities during this period will include but not be limited to:

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

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

#### **9.5 POST-CLOSURE MONITORING AND MAINTENANCE**

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

- Confirmation that any waste, wastewater or other pollutants that is generated as a result of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan,
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning.
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants.

Annual environmental reports will be submitted to the Competent Authority and other relevant Departments for at least one-year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority. The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed and free condition.

#### **9.6 EXPLAIN WHY IT CAN BE CONFIRMED THAT THE REHABILITATION PLAN IS COMPATIBLE WITH THE CLOSURE OBJECTIVES.**

The rehabilitation plan is compatible with the closure objectives in that it seeks to ensure that negative impacts on the receiving environment that could not be prevented or mitigated during prospecting are rehabilitated. The appropriate disposal of waste will ensure that land is usable, in alignment with surrounding land uses and that no hazardous materials are left on site post-prospecting.

##### ***9.6.1 Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.***

Please refer to Part A Section 21.

#### **9.7 CONFIRM THAT THE FINANCIAL PROVISION WILL BE PROVIDED AS DETERMINED.**

Sylvania Northern Mining (Pty) Ltd can fund the prospecting activities internally.



**10 MECHANISMS FOR MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREON, INCLUDING**

- a) *Monitoring of Impact Management Actions*
- b) *Monitoring and reporting frequency*
- c) *Responsible persons*
- d) *Time period for implementing impact management actions*
- e) *Mechanism for monitoring compliance*

The proposed monitoring requirements are provided in the Table below.

**Table 10-1: Mechanisms for monitoring compliance**

<b>Source activity monitoring and reporting</b>	<b>Impacts requiring monitoring programmes</b>	<b>Functional requirements for monitoring</b>	<b>Roles and Responsibilities</b>	<b>Frequency and time periods for implementing impact management actions</b>
Contaminated water from waste storage area could detrimentally impact on watercourses quality, biota and habitat.	Waste water generation	Waste water quality and quantity	Contractor, ECO, PRH	As needed
Contamination from spills from chemical toilets / emptying of septic tank (if applicable) could impact on water quality which in turn could impact on the biota and habitat as well.	Waste generation	Waste generation	Contractor, ECO, PRH	As needed
Dust generated as a result of the prospecting activities including travelling on road could impact on local PM10 levels.	Complaints received	Dust levels if complaints are received	Contractor, ECO, PRH	As needed
Dust generated could impact on surface water quality, and biota should it reach watercourses and settle within this area.	Complaints received	Dust levels if complaints are received	Contractor, ECO, PRH	As needed
General waste generation e.g. plastic bags, bottles etc. could impact on water quality and the habitat and biota in watercourses.	Waste generation (contaminated soil)	Waste generation	Contractor, ECO, PRH	As needed
Hydrocarbon spills from vehicles and other equipment could negative impact water quality, habitat and biota.	Waste generation	Waste generation	Contractor, ECO, PRH	As needed
Impact on groundwater levels	Background water quality and groundwater levels.	Background water quality and groundwater levels.	Contractor, ECO, PRH	Continuously





Source activity monitoring and reporting	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and Responsibilities	Frequency and time periods for implementing impact management actions
Impact on groundwater quality as a result of hydrocarbon spills from machinery.	Waste generation (contaminated soil)	Amount of waste generated.	Contractor, ECO, PRH	Continuously
Invasive prospecting and associated activities may impact on areas designated as high sensitivity, including critical biodiversity areas and watercourses situated in and around the Prospecting Right area. The majority of the proposed target areas are located in area categorised as ONA and NNR. Limited sections of the target area on the farm Altona 696 are located on areas categorised as CBA. The layout of the prospecting target areas appears to have been designed to avoid most of the non-perennial tributaries. The activity may lead to the loss of species of conservation concern. Based on the desktop study findings, no flora SCC are considered to be likely to occur on the project area. However, fifteen (15) faunal species previously recorded in the area queried are categorised as SCC.	Vegetation disturbance and presence of Alien Invasive Plants	Protected Fauna and Flora species observed on site. AIPs on site.	Specialist PRH, Contractor, ECO	Before prospecting activities on site commence. During the Operational phase
Invasive prospecting and associated activities will lead to destruction and damage of habitats and vegetation communities and overall loss of biodiversity and ecosystem function within the clearance and operational area. Destruction of habitat may lead to faunal species migrating to other more favourable areas.	Vegetation disturbance and presence of Alien Invasive Plants	Protected Fauna and Flora species observed on site. AIPs on site.	Specialist PRH, Contractor, ECO	Before prospecting activities on site commence. During the Operational phase
Loss of topsoil as a resource as a result of the prospecting activities	Loss of topsoil as a resource as a result of the prospecting activities	Loss of topsoil as a resource as a result of the prospecting activities	PRH, Contractor, ECO	During Rehabilitation phase
Rehabilitation could be ineffective if rehabilitation actions are not effectively implemented. Without the necessary mitigation measures, rehabilitation will be less successful and the ecology of the	Vegetation disturbance and presence of Alien Invasive Plants	Protected Fauna and Flora species observed on site. AIPs on site.	Specialist PRH, Contractor, ECO	During and After Rehabilitation



Source activity monitoring and reporting	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and Responsibilities	Frequency and time periods for implementing impact management actions
impacted areas may not recover to a pre-prospecting state. Without mitigation the alien invasive species may increase and result in a degraded veld condition making the property less viable for post-closure land use activities such as wilderness, grazing and agriculture.				
Removal of run-off from the surface water resource could reduce surface flow in watercourses which in turn could impact on the habitat and biota within this area.	Spills from sludge containment facilities at the drilling site	Volume and quality of sludge generated	Contractor, ECO, PRH	As needed
Silt generation during rainfall events could reach surface water resources result in in siltation of the watercourse which could impact on the biota, habitat, flow regime and the physico & chemical quality of the water in the watercourse.	Spills from sludge containment facilities at the drilling site	Volume and quality of sludge generated	Contractor, ECO, PRH	As needed
Soil contamination from hydrocarbon spills if not removed could impact on water quality should the hydrocarbons enter the watercourses, this could impact on the biota and habitat as well.	Waste generation (contaminated soil)	Waste generation	Contractor, ECO, PRH	As needed
The continuous human activity over a longer-term period may further impact on the faunal communities within the area. Associated noise, waste, the smell of humans and physical infiltration into remaining natural areas are problematic and may lead to declining populations (where the disturbance of habitat has caused habitat remaining to become unfavourable).	Vegetation disturbance and presence of Alien Invasive Plants	Protected Fauna and Flora species observed on site. AIPs on site.	Specialist PRH, Contractor, ECO	Before prospecting activities on site commence. During the Operational phase
The operation of machinery could result in increased noise levels in an area that is rural in nature. This noise could become a nuisance to the residents.	Complaints received	Noise levels if complaints are received	Contractor, ECO, PRH	As needed



<b>Source activity monitoring and reporting</b>	<b>Impacts requiring monitoring programmes</b>	<b>Functional requirements for monitoring</b>	<b>Roles and Responsibilities</b>	<b>Frequency and time periods for implementing impact management actions</b>
Vegetation clearance will destroy indigenous vegetation and lead to possible invasive and/or exotic species establishing in the area and edge-effects occurring surrounding the prospecting activities. Bare areas may become vulnerable to Alien and Invasive Plant species and these may compete with indigenous species, likely leading to the migration of sensitive species from the site to a more favourable habitat.	Vegetation disturbance and presence of Alien Invasive Plants	Protected Fauna and Flora species observed on site. AIPs on site.	Specialist PRH, Contractor, ECO	Before prospecting activities on site commence. During the Operational phase

As the areas of direct influence is located more than 100 m from a watercourse and more than 500 m from a delineated wetland no monitoring is proposed relating to natural watercourses.

**11 INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT/ ENVIRONMENTAL AUDIT REPORT.**

Regular monitoring of all the environmental management procedures and mitigation measures shall be carried out by Sylvania in order to ensure that the provisions of this EMP are adhered to. Formal monitoring and performance assessment of the EMP will be undertaken on an annual basis.

**12 ENVIRONMENTAL AWARENESS PLAN**

**12.1 MANNER IN WHICH THE APPLICANT INTENDS TO INFORM HIS OR HER EMPLOYEES OF ANY ENVIRONMENTAL RISK WHICH MAY RESULT FROM THEIR WORK.**

The following Environmental Awareness Training will be implemented by Sylvania Northern Mining in order to inform employees and contractors of the environmental risk that may result from their work, or the risk of their interaction with the sensitive environment. The training will be conducted as part of the induction process for all new employees (including contractors) that will perform work in terms of the proposed activities. Proof of all training provided must be kept on-site. The Environmental Awareness Training will, as a minimum cover the following topics within Table 12-1

**Table 12-1: Environmental Awareness Plan**

<b>Air Quality</b>	Activities that may result or mitigate impact on air quality; speeding on roads, the requirements for dust suppression, etc. Negative impacts on the receiving environment if mitigation measures are not implemented.
<b>Surface and groundwater</b>	Risks to surface and groundwater, e.g. fuel and chemical handling and further risks of erosion or damage to riparian vegetation. How incidents should be reported, and emergency requirements. The importance to re-use water and to prevent spillages. No-go areas.
<b>Cultural Heritage</b>	To respect all cultures and believes. How to report any sightings of heritage importance as identified during operation activities (e.g. fossils). No-go areas.
<b>Fauna</b>	Overview of the fauna found on/around site and the uniqueness thereof. Mitigation measures that all contractors and employees need to abide by. No contractor or personnel allowed to catch or kill any species, and how any sightings should be reported if further actions are required (e.g. to catch and release).
<b>Flora</b>	Overview of the flora diversity on site, and the rare and endangered nature thereof. Measures taken by the company to protect species. No contractor or personnel allowed to remove, harvest or destroy any flora species unless clearly instructed based on the operational plans. No-go areas.
<b>Waste management</b>	Measures to avoid waste generation and to participate in waste minimisation/reduction.
<b>Traffic strategies.</b>	To stay on designated roads and not create new roads on areas that will not be used for prospecting purposes. To be aware of the fauna species and to be on the lookout and avoid collisions.
<b>Emergency Preparedness and Response</b>	How to report any emergency or incident. Incident and emergency reporting requirements.
<b>General rules and conduct</b>	Respect for the sensitive environment. Do not litter. Respect for each other and for different cultures. Safety and health requirements

## 12.2 MANNER IN WHICH RISKS WILL BE DEALT WITH IN ORDER TO AVOID POLLUTION OR THE DEGRADATION OF THE ENVIRONMENT.

All employees must be provided with environmental awareness training to inform them of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. Employees should be provided with environmental awareness training before prospecting operations start. All new employees should be provided with environmental awareness training. Induction courses will be provided to all employees by a reputable trainer.

## 13 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

An environmental audit report will be submitted annually as per DMRE requirements.

The financial provision will be updated on an annual basis and submitted to the DMRE.

## 14 UNDERTAKING

### 14.1 ENVIRONMENTAL ASSESSMENT PRACTITIONER

The EAP herewith confirms

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

Signature of the environmental assessment practitioner: \_\_\_\_\_

Name of company: \_\_\_\_\_

Date: \_\_\_\_\_

### 14.2 PROSPECTING RIGHTS HOLDER

I, \_\_\_\_\_,  
the undersigned and duly authorised thereto hereby:

- a) Confirm that the financial provision as required will be available; and
- b) Undertake to adhere to the requirements and to the conditions as set out in the EMPr submitted to the Director: Mineral Development and approved on \_\_\_\_\_

Signed at.....on this..... day.....

Signature of applicant .....

Designation .....

**-END-**

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## 16 APPENDICES

### **Appendix 1: Qualifications of the EAP**

### **Appendix 2: Experience of the EAP**

### **Appendix 3: Locality Map**

- Locality map at a scale not smaller than 1:250 000
- Regulation 2(2) map
- Location and area extend of main and listed activities

### **Appendix 4: Final Site Maps**

- Northern area
- Southern area

### **Appendix 5: Public Participation Process**

- Issues and Response Report
- Site Notices
- Background Information Documents
- Newspaper Advert
- Proof of consultation (emails send and received)
- Letters / Registration forms received

### **Appendix 6: Specialist Reports**

- Desktop Surface Water Assessment
- Desktop Terrestrial Ecology Assessment
- Desktop Heritage Impact Assessment
- Desktop Soil, Land Use and Land Capability