Soil and Agricultural Report for the proposed Black Mountain Mining Sandgat Prospecting Right Project

Khai-Ma Local Municipality, Namakwa District, Z F Mgcawu and Namakwa District Municipalities, Northern Cape Province, South Africa

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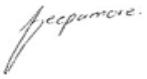
Reviewer & Responsible Specialist	Masilabela Seepamore (SACNASP 113907) 
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017 (as amended). We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than providing a professional service within the constraints of the project (timing, time, and budget) based on the principals of science.

Table of Contents

1 Introduction 1
1.1 Background 1
1.2 Project Description 3
1.3 Scope of Work 8
1.4 Assumptions and Limitations 9
1.5 Key Legislative Requirements 9
1.6 Legislative Framework 9
2 Fieldwork 10
3 Results and Discussion 11
3.1 Desktop Information 11
3.1.1 Climate 11
3.1.2 Geology & Soils 12
3.2 Baseline Findings 15
3.3 Sensitivity Verification 18
3.3.1 Screening Report – Sandgat Prospecting Area 18
4 CARA Requirements 21
5 Impact and Management Measures 21
5.1 Prospecting activities Impact Assessment 21
5.2 Management Measures 24
6 Conclusion 28
6.1 Specialist Statement 28
6.2 Statement Conditions 28
7 References 29
8 Appendix Items 30
8.1 Appendix A: Methodology 30
8.1.1 Desktop Assessment 30
8.1.2 Field Survey 30
8.1.3 Land Capability 30
8.2 EIMS Impact Assessment for the proposed activities - Loss of Land Capability 33
8.3 EIMS Impact Assessment for the proposed activities - Loss of Land Grazing Potential 34
8.4 Appendix C: Specialist Declarations 36
8.5 Appendix D: Curriculum Vitae 38

List of Tables

Table 1-1 Details of the project and type of minerals ..... **Error! Bookmark not defined.**

Table 1-2 Proposed duration of prospecting phases and associated activities 7

Table 1-3 Agricultural Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report 10

Table 3-1 Soils expected at the respective terrain units within the Ag 3 land type (Land Type Survey Staff, 1972 - 2006) 14

Table 3-2 Soils expected at the respective terrain units within the Ag 61 land type (Land Type Survey Staff, 1972 - 2006) 14

Table 3-3 Soils expected at the respective terrain units within the Ag 25 land type (Land Type Survey Staff, 1972 - 2006) 15

Table 3-4 Soils expected at the respective terrain units within the Ai 29 land type (Land Type Survey Staff, 1972 - 2006) 15

Table 3-6 Summary of the screening tool vs specialist assigned sensitivities 21

Table 5-1 Summative results of the Impact Assessment conducted for the proposed project 22

Table 5-2 Anticipated impacts for the proposed support infrastructure on agricultural resources 23

Table 5-3 Mitigation Measures and Management Outcomes 25

Table 8-1 Land capability class and intensity of use (Smith, 2006) 30

Table 8-2 The combination table for land potential classification 31

Table 8-3 The Land Potential Classes 31

Table 8-4 National Land Capability Values (DAFF,2017) 31

List of Figures

Figure 1-1 Map showing the approximate location of the proposed project area 2
Figure 1-2 Proposed layout of the Project 2
Figure 1-3 Proposed Project deposits and prospects 6
Figure 2-1 illustrating the field coverage 11
Figure 3-1 Summarised climate for the region (Mucina & Rutherford, 2006) 12
Figure 3-2 Land type associated with the proposed project area 13
Figure 3-3 Illustration of land type Ag 3 terrain units (Land Type Survey Staff, 1972 – 2006) 13
Figure 3-4 Illustration of land type Ag 61 terrain units (Land Type Survey Staff, 1972 – 2006) 13
Figure 3-5 Illustration of land type Ag 25 terrain units (Land Type Survey Staff, 1972 – 2006) 14
Figure 3-6 Illustration of land type Ai 29 terrain units (Land Type Survey Staff, 1972 – 2006) 14
Figure 3-7 Illustration of land type Ib 252 terrain units (Land Type Survey Staff, 1972 – 2006)..... 14
Figure 3-8 Soil forms found within the proposed project area..... 16
Figure 3-9 Soil forms found within the proposed project area; A) Clovelly soil form; B) Oakleaf soil form; and C-F) Mispah soil form 17
Figure 3-10 Different land uses found within the 50 m buffer of the proposed project area; A-E) Natural veld and Livestock grazing; D) Ephemeral pans..... 17
Figure 3-11 Land Potential of the proposed project area..... 18
Figure 3-12 Map of Relative Agricultural Theme Sensitivity for the Sandgat Prospecting Right generated by the Environmental Screening Tool..... 19
Figure 3-13 Overall site verified sensitivity of the proposed project area 20

1 Introduction

1.1 Background

The Biodiversity Company was appointed to conduct a soil and agricultural potential assessment in support of the environmental authorisation application process for the proposed Black Mountain Mining Sandgat Prospecting Right located in the Khâi-Ma and Kai !Garib Local Municipalities, Z F Mgcawu and Namakwa District Municipalities, Northern Cape Province, South Africa (Figure 1-1). The provided assessment area will be referred to as the Project Area of Influence (PAOI) for reporting purposes.

The approach adopted for this assessment has taken cognisance of Government Notice 320 in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) dated 20 March 2020: “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the NEMA, 1998, when applying for Environmental Authorisation”. The National Web based Environmental Screening Tool (DFFE, 2025) has characterised the agricultural theme sensitivity of the project area as “Low to Medium” sensitivity, with a key consideration of this assessment being the determination of agricultural theme sensitivities for the project. Based on the verified baseline findings, the proposed project area was found to have a “Low to Medium” sensitivity, sensitive areas. GNR 320 requirements of an Agricultural Compliance Statement stipulate that a 50 m buffered development envelope be considered.

This report aims to present and discuss the findings from the soil resources identified within the 50 m buffered area. The report will also identify the soil suitability and land potential of these soils; the land uses within the assessment area and the risks associated with the proposed project from an agricultural and soil resources management perspective.

This report should be interpreted after taking into consideration the findings and recommendations provided by the specialist. Further, this report should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making, as to the soil resources of the proposed project.

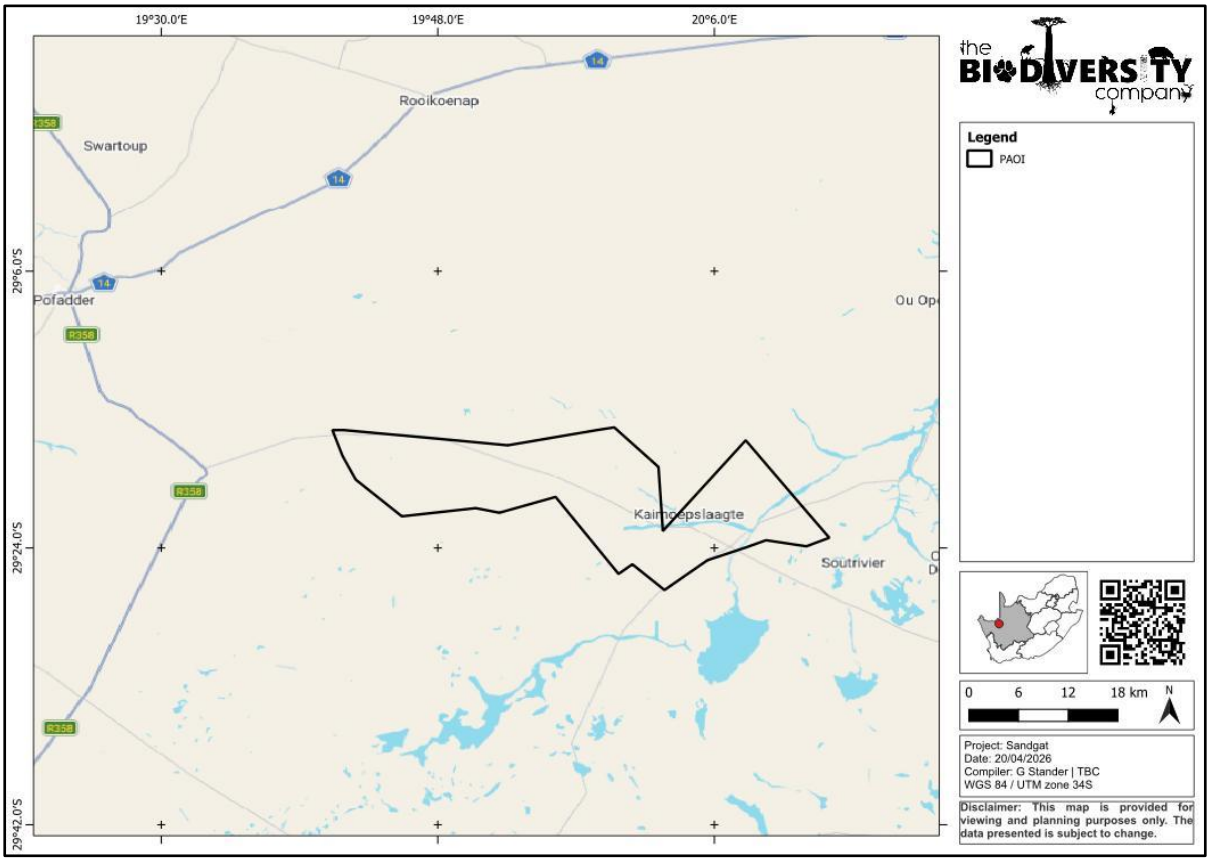


Figure 1-1 Map showing the approximate location of the proposed project area

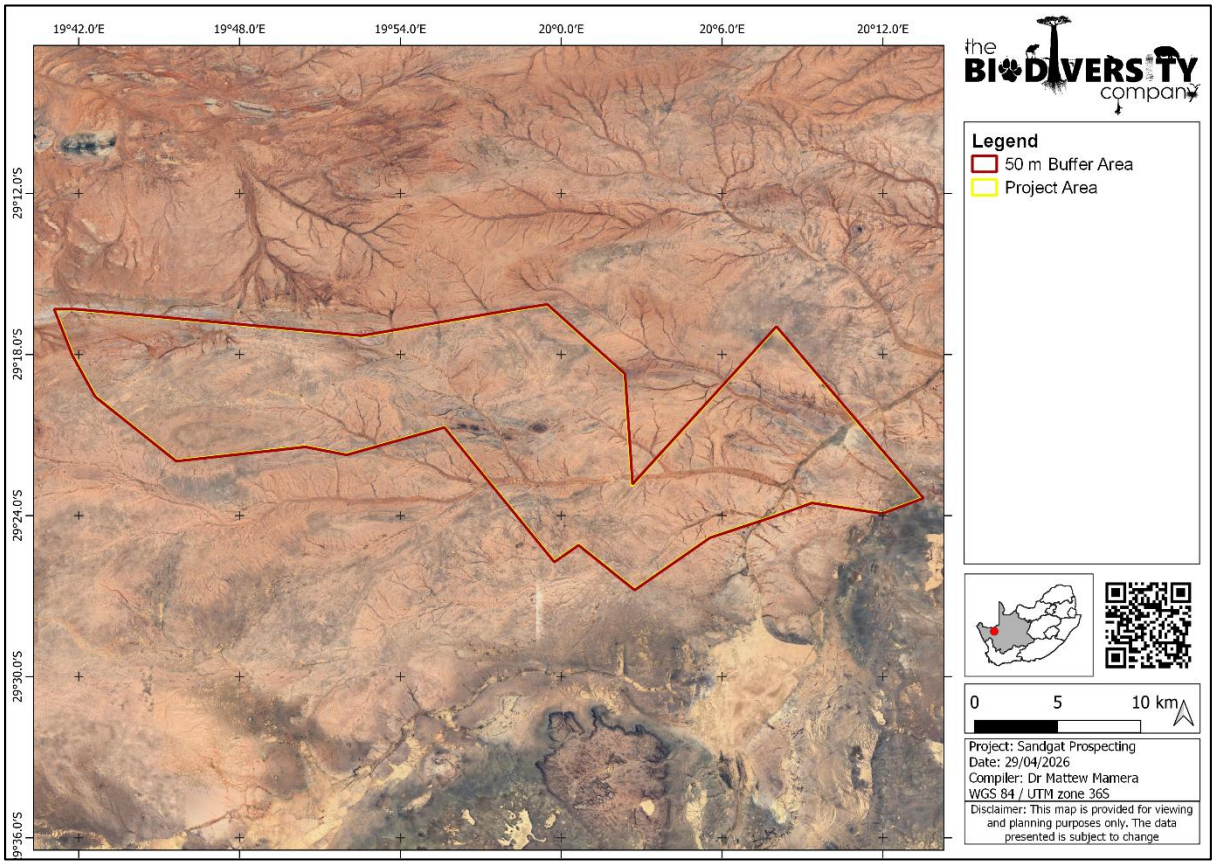


Figure 1-2 Proposed layout of the Project

1.2 Project Description

1.2.1 Description of the scope of the proposed overall activity

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

Figure 1-3 below depicts the proposed prospecting area, the proposed areas of interest within the application area will be defined within the course of prospecting activities. This application employs a phased approach, where the work program is divided into several sequential sections. At the end of each section there will be a period of compiling, evaluating and reporting results. These results will not only determine whether the project proceeds, but also the manner in which it will go forward. Essentially, BMM will only action the next phase once satisfied with the results obtained. It is not possible to give details of the drilling program before the surveys and surface work phase 1 is completed. In the event that more information becomes available or that an ore body is located at an earlier stage, then an amended program will be put forward for the DMPR's approval.

It is anticipated that the invasive program will consist of a number of boreholes / drill sites with a footprint of approximately 300 m2 each. Vegetation will be cleared at the borehole locations within the application area. Minor access tracks will be created to access the proposed borehole sites where there are no existing roads. The total length of the access routes is anticipated to be 5 000 m and the approximate width is 3m. The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalised surface plan showing the intended location, extent and depth of boreholes to be completed.

No bulk sampling work is to be carried out during this prospecting program. Initial prospecting will be carried out by BMM itself, utilising its own in-house geologists to conduct and oversee the work. Drilling will be outsourced to a local drilling company. The methods detailed below will be used to investigate the prospecting area.

It is hereby noted that the different phases and timeframes of the prospecting herein envisaged are, by their nature, dependent on the results obtained during the preceding phases of such prospecting. The proposals set out in this Prospecting Work Programme are therefore made on the basis that results obtained during the preceding phases may necessitate reasonable changes and adaptations to such proposals, which will be reported as prescribed.

1.2.2 Description of planned non-invasive activities

These activities do not disturb the land where prospecting will take place e.g., aerial photography, desktop studies, aeromagnetic surveys, etc.

1.2.2.1 Phase 1: Desktop study

To include:

- Compilation of historical exploration data with the aim of developing a working plan of the prospecting area on a suitable scale (1:5,000 or 1:10,000).
- Analysis of existing data and maps to further understand prospecting area structure & geology
- Initial targeting and ranking of prospective areas

1.2.2.2 Phase 2: Geological field mapping

The field mapping will be focused on potentially prospective areas (Bushmanland Group rocks) to improve understanding of the structure & geology in order to define targets for ground-based geophysics as well as to be able to interpret geophysical results. Geological mapping will be on a scale suitable for the observed geological variability and will be conducted by an in-house well-trained and highly experienced geologist.

During the geological field mapping activity soil and litho-sampling along with analysis (XRF & or assaying) may be conducted to determine prospective horizons.

1.2.2.3 Phase 3: Semi-Regional Geophysical Survey (ground based)

The primary ground-based geophysical technique that will be employed will be time-domain electromagnetics (TDEM) utilizing a new state-of-the-art SQUID electromagnetic sensor. Existing airborne EM and aeromagnetic coverage will guide the ground follow-up strategy. Additional techniques, such as controlled source audio magnetotellurics (CSAMT) and direct current resistivity / induced polarization, might be employed over prospective targets.

1.2.3 Description of planned invasive activities

These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc.

1.2.3.1 Drilling

The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalized surface plan showing the intended location, extent and depth of boreholes to be completed.

Diamond drilling will be of the standard HQ or NQ size. Down hole surveys will be done every 50m in each hole. Core will be marked, logged, photographed and sampled according to the standard of the applicant's logging and sampling procedures.

Down the hole geophysical surveying will take place upon completion of the exploratory boreholes along with Ground EM surveys to determine positions of conductors.

Rehabilitation of drill sites will be done according to an approved Environmental Management Plan.

Percussion Rotary Air Blast (RAB) or Reverse Circulation (RC) drilling may be carried out for pre-collaring of diamond drill boreholes or for obtaining samples if significant depth of cover is encountered over particular targets.

1.2.3.2 Assaying

Rock chip / soil samples will be sent to a laboratory of the applicant's choice to be crushed, split, pulverized and assayed. Samples from core will be split using a core cutter before being sent to the laboratory for analysis.

1.2.3.3 Metallurgical Test Work

Metallurgical test work would start during phase 7 of the prospecting work programme. These tests will be done by and in consultation with a preferred and accredited Laboratory of the applicant's choice.

1.2.4 Phase 4: Boreholes

The initial planned invasive exploration activities will consist of diamond drill boreholes drilled to appropriate depths to target any anomalies identified during Phases 2 and 3 of the non-invasive portion of the prospecting work plan. The work will consist of:

- Access and drill site preparation
- Diamond core drilling
- Sampling and assaying
- Quality assurance and quality control programs
- Down hole geophysics
- Rehabilitation of drill sites
- Recording and Integration of data

1.2.5 Phase 7: Boreholes

This phase of boreholes would determine the continuity of mineralization and potential deposit size. The work will consist of:

- Access and drill site preparation
- Widely spaced diamond drilling and analyses to confirm grade / tonnage potential
- Sampling and assaying
- Quality assurance and quality control programs
- Metallurgical test work
- Rehabilitation of drill sites
- Recording and Integration of data

1.2.6 Phase 8: Boreholes

This phase of boreholes would provide enough information to be able to calculate an inferred resource. The work would consist of:

- Access and drill site preparation
- Close spaced infill diamond drilling and analyses to determine actual grade / tonnage
- Sampling and assaying
- Quality assurance and quality control programs
- Metallurgical test work
- Geotechnical drilling program
- Rehabilitation of drill sites
- Recording & Integration of data

Only the mineral deposit of the area was provided as shown below;

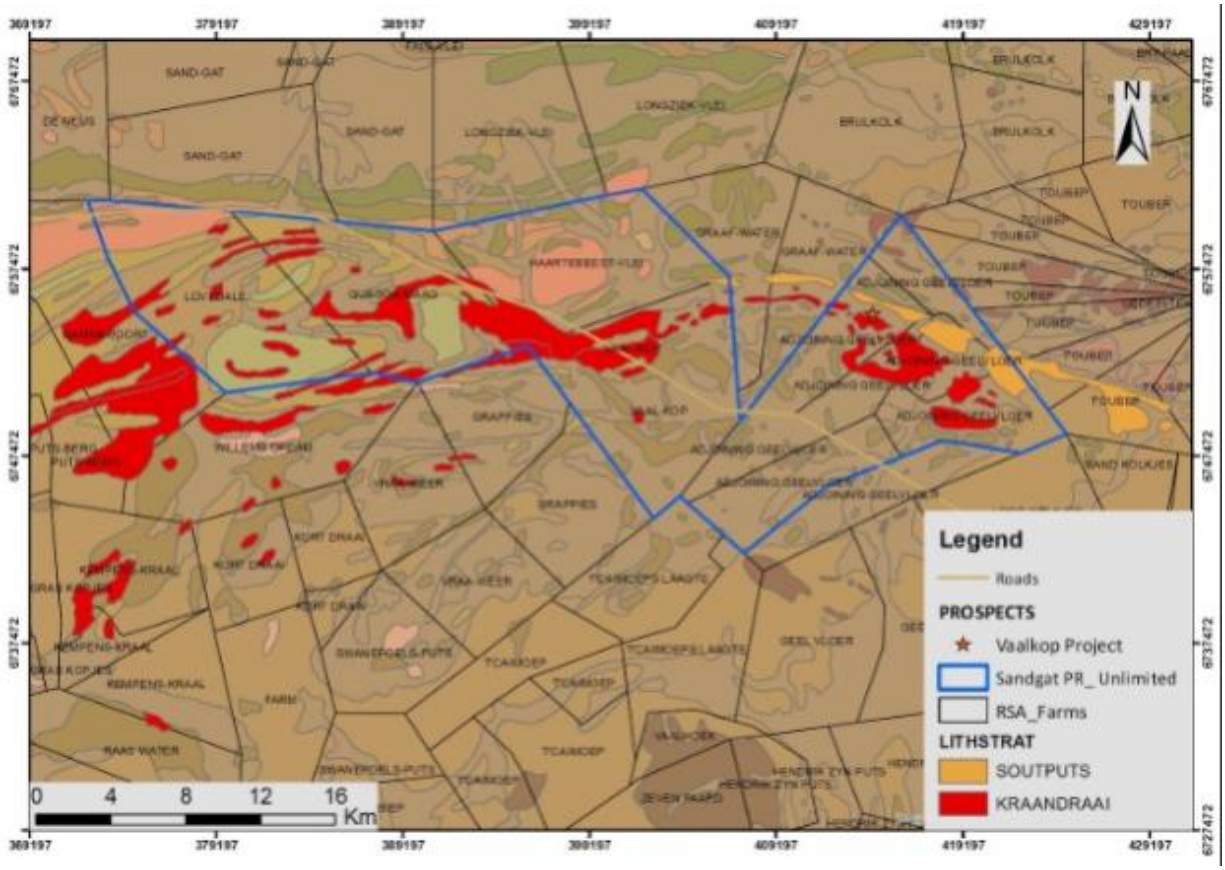


Figure 1-3 Proposed Project deposits and prospects

Sandgat prospecting right project description has been provided below which list similar activities expected for the project;

Black Mountain Mining (Pty) Ltd (BMM) (the Applicant) has submitted an application for a Prospecting Right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and an Application for Environmental Authorisation in terms of Chapter 4 of GNR 982 promulgated under the National Environmental Management Act (Act 107 of 1998) (NEMA) to prospect for ferrous & base metals (Copper Ore, Iron Ore, Lead, Ore, Zinc Ore, Manganese Ore, Nickel and Molybdenum) and associated metals and minerals , precious metals/Gemstones (Gold Ore, Silver Ore), and nuclear fuels/Ferrous and Base metals (Uranium ore) and all associated metals and minerals.

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

The BAR has been designed to meet the requirements for a BAR and Environmental Management Programme (EMPr) as stipulated in the 2014 EIA Regulations promulgated under the NEMA. The adjudicating authority for this Application will be the Department of Mineral and Petroleum Resources

(DMPR), and this report has been compiled in accordance with the applicable DMPR guidelines and reporting template.

This specialist assessment is compiled to support the BAR and EMPr to be submitted.

This application employs a phased approach, where the work program is divided into several sequential sections. At the end of each section there will be a period of compiling, evaluating and reporting results. These results will not only determine whether the project proceeds, but also the way it will go forward. Essentially, the Applicant will only action the next phase once satisfied with the results obtained (Table 1-1).

It is not possible to give details of the drilling program before the surveys and surface work phase 1 is completed. In the event that more information becomes available or that an ore body is located at an earlier stage, then an amended program will be put forward for the DMPR's approval.

No bulk sampling work is to be carried out during this prospecting program.

Initial prospecting will be carried out by the applicant itself, utilizing its own in-house geologists to conduct and oversee the work. Drilling will be outsourced to a local drilling company. The methods detailed below will be used to investigate the prospecting area.

Please note, the "invasive prospecting" phases, which will have an environmental impact, have been highlighted with red text.

Table 1-1 Proposed duration of prospecting phases and associated activities

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required. (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g., Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g., geologist, mining engineer, surveyor, economist, etc.)
1	Non-Invasive Prospecting Desktop Study: Literature Survey / Review	Geologist	Month 1-12	Initial geological targeting report supported by historical records and existing data	Month 12	**Geologist**
2	Non-Invasive Prospecting Geological Field Mapping	Geologist & field crew	Month 6-12	Detailed geological targeting report accompanied by maps & plans of ground truthing of initial geological targeting.	Month 12	**Geologist**
3	Non-Invasive Prospecting Semi-regional Ground Geophysical Survey	Geophysicist / Geologist / field crew	Month 12-24	Survey report detailing possible targets for further exploration, report supported by maps, plans & cross sections	Month 24	**Geophysicist**
4	Invasive Prospecting Exploration Boreholes (16 RAB holes – 2400m; 4 DD holes – 2000m)	Geologist / drill rig team / field crew / laboratory technicians	Month 24-34	Borehole cored data & RAB data: lithological logs, geophysical down hole surveys, assay results for mineralized intercepts.	Month 34	**Geologist**

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required. (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g., Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g., geologist, mining engineer, surveyor, economist, etc.)
5	Non-Invasive Prospecting Compilation, interpretation, and modeling of data	Geologist / Geophysicist	Month 34-36	Modelling of data. Interpretation and 3D modeling of potential deposit. Generation & ranking of mineralized targets for further exploration work	Month 36	**Geologist**
6	Non-Invasive Prospecting Detailed Ground Geophysical Survey on individual positively mineralized targets to define extent	Geophysicist / Geologist / field crew	Month 36-42	Survey report detailing individual targets. Plans for drill hole intersections supported by cross sections	Month 42	**Geophysicist**
7	Invasive Prospecting Boreholes to confirm continuity of mineralization & potential deposit size (20 DD holes – 8000m)	Geologist / drill rig team / field crew / laboratory technicians	Month 42-48	Widely spaced borehole cored data: lithological logs, geophysical down hole surveys, assay results for mineralized intercepts, metallurgical test work Risk assessment study to advance to next phase	Month 48	**Geologist**
8	Invasive Prospecting Resource definition drilling (40 DD holes – 16000m)	Geologist / drill rig team / field crew / laboratory technicians	Month 48-60	Closely spaced borehole cored data: lithological logs, geophysical down hole surveys, assay results for mineralized intercepts, metallurgical test work Resource estimation work producing an Inferred Mineral Resource	Month 60	**Geologist**
9	Non-Invasive Prospecting Analytical Desktop Pre-Feasibility Study	Economic Geologist / Mining Geologist	Month 54-60	Geological & Pre-feasibility reports, maps & plans Risk assessment study to determine if full feasibility is warranted	Month 60	Mine Engineer / Economic Geologist (professionally qualified persons)

1.3 Scope of Work

In addition to the requirements stipulated in GNR 320, the following Terms of Reference apply to the Agricultural Compliance Statement:

- Ensure a thorough assessment, which includes both the desktop assessment of databases and aerial photography; a description of the on-site verification of the agricultural potential of the area; and the soil forms present in the development area;
- Identify and assess potential impacts on both agricultural potential and soil resulting from the proposed project;
- Identify and describe potential cumulative soil, agricultural potential and land capability impacts resulting from the proposed project in relation to proposed and existing developments in the surrounding area; and
- Recommend mitigation, management, and monitoring measures, to minimise impacts and/or optimise benefits associated with the proposed project.

1.4 Assumptions and Limitations

The following aspects were considered as limitations;

- Only the slopes affected by the proposed development have been assessed;
- It has been assumed that the extent of the development area provided by the responsible party is accurate;
- The GPS used for ground truthing is accurate to within five meters. Therefore, the soil and the observation site's delineation plotted digitally may be offset by up to five meters to either side; and
- No heavy metals have been assessed, nor fertility been analysed for the relevant classified soils.

1.5 Key Legislative Requirements

The report follows the protocols as stipulated for agricultural assessment in Government Notice 320 of 2020 (GNR 320). This Notice provides the procedures and minimum criteria for reporting in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (No. 107 of 1998) (NEMA).

The above mentioned are supported by additional legislation that aims to manage the impact of development on the environment and the natural resource base of the country. Related legislation to this effect includes:

- Conservation of Agricultural Resources Act (Act 43 of 1983);
- National Environmental Management Act (Act 107 of 1998);
- National Water Act (Act 36 of 1998); and
- Preservation and Development of Agricultural Land Act (Act No. 39 of 2024).

1.6 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on soil and agricultural assessment as per the Government Notice 320 published in terms of NEMA, dated 20 March 2020: "Procedures for the Assessment and Minimum Criteria for

Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation".

An Agricultural Compliance Statement must contain the information as presented in Table 1-2 below.

Table 1-2 Agricultural Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report

Information to be Included (as per GN 320, 20 March 2020)	Report Section
Details and relevant expertise as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae	Page i, Appendix D
A signed statement of independence by the specialist	Appendix C
A map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool	Section 3.3
Confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities	Section 6
A substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development	Section 6.1
Any conditions to which this statement is subjected	Section 6.2
Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr	Section 5.1
A description of the assumptions made and any uncertainties or gaps in knowledge or data	Section 1.3

2 Fieldwork

The fieldwork assessment for the proposed project area was conducted on 13th to the 16th of April 2026, to determine the available soil forms and current land uses within the assessed area. A map illustrating the field work tracks is presented in Figure 2-1 below. Seasonality has no bearing on the soil assessment and fieldwork is therefore deemed sufficient for the proposed development.

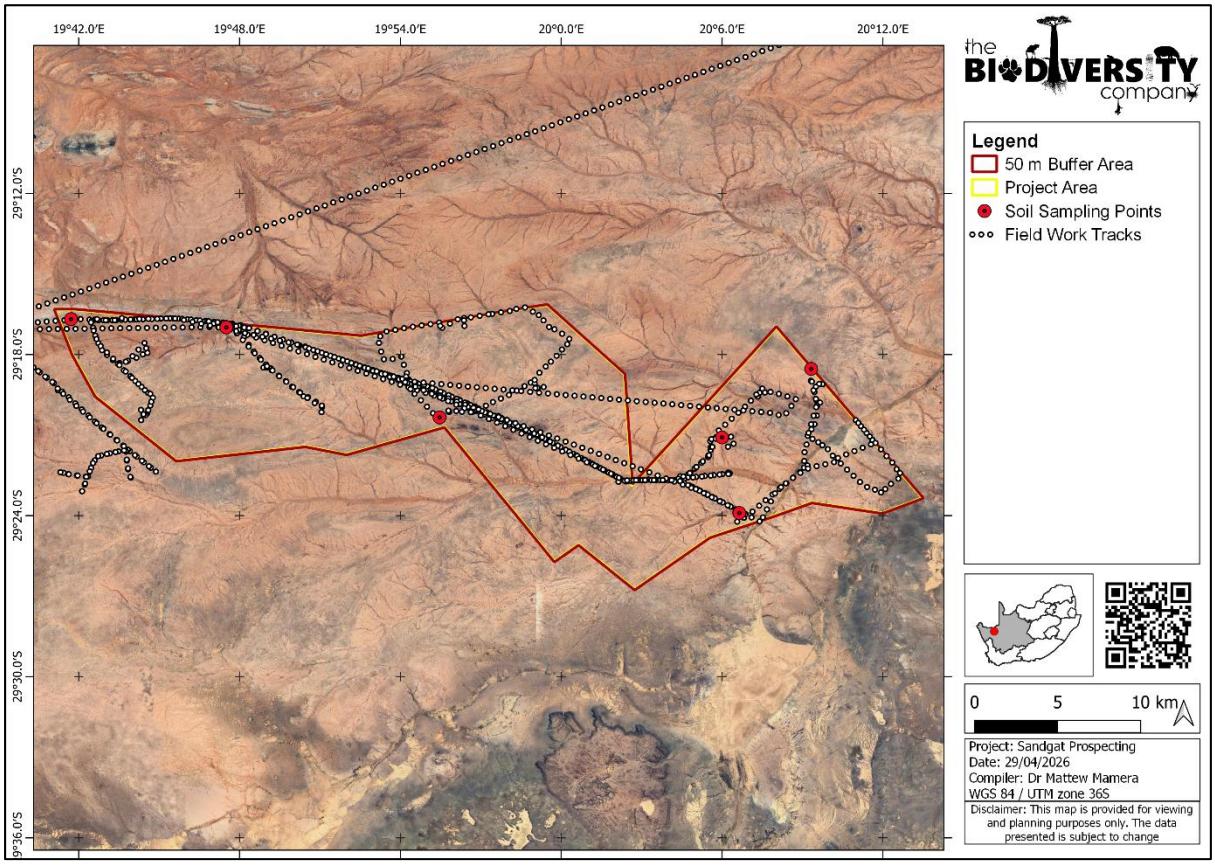


Figure 2-1 illustrating the field coverage

3 Results and Discussion

3.1 Desktop Information

3.1.1 Climate

The project area falls within the Bushmanland Arid Grassland and Bushmanland Basin Shrubland. The area experiences late summer/early autumn rainfall and very variable year to year. The mean annual precipitation for the area ranges between 70 to 200 mm, west to east, respectively. The area also experiences frequent frost which ranges from around 10 days per year in the northwest to about 35 days in the east. The mean maximum and minimum monthly temperatures range from 40.60C and –3.7OC for January and July respectively (Mucina & Rutherford, 2006; Figure 3-1).

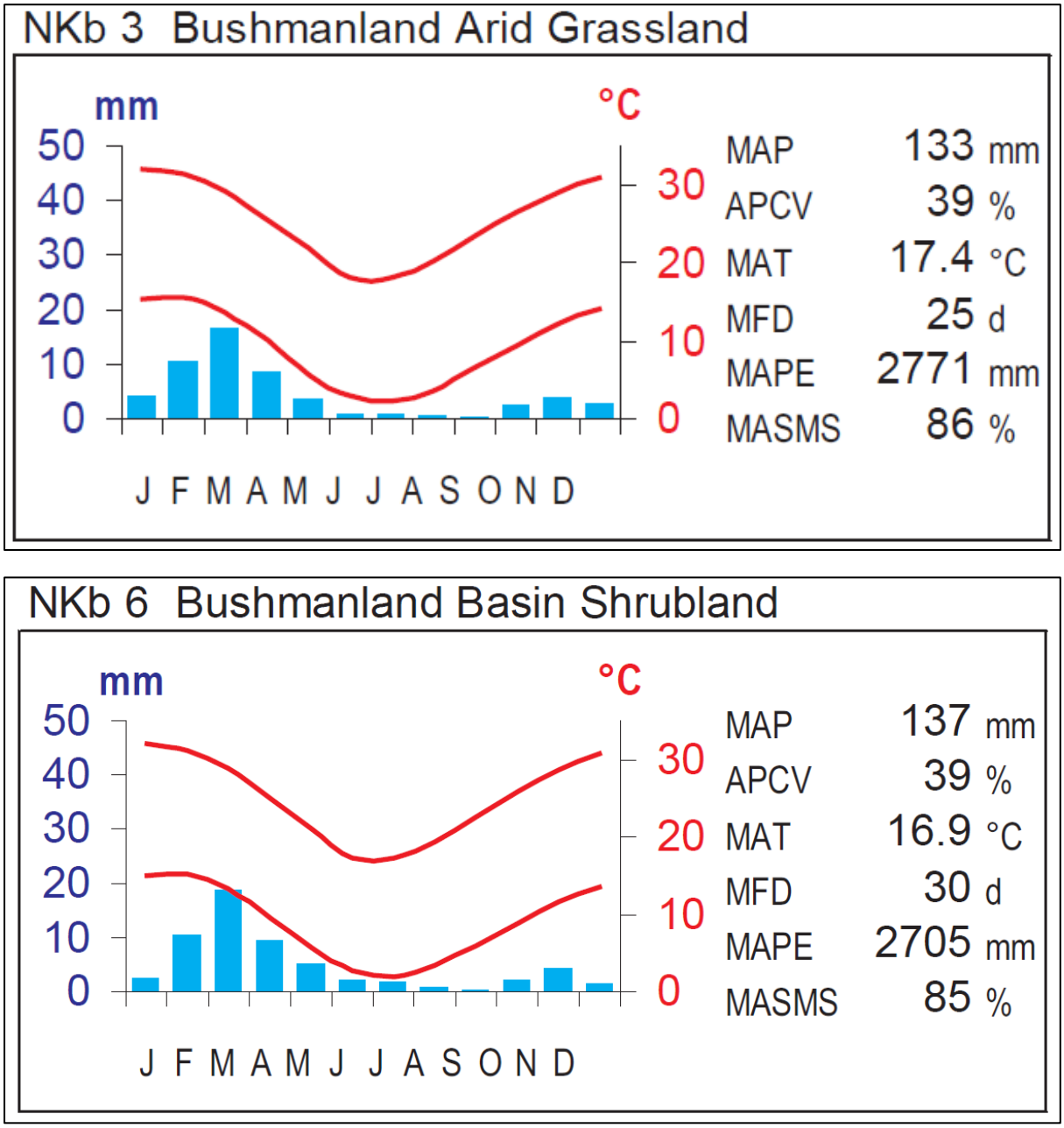


Figure 3-1 Summarised climate for the region (Mucina & Rutherford, 2006)

3.1.2 Geology & Soils

The geology of the area includes recent (Quaternary) alluvium, calcrete, superficial deposits of the Kalahari group, extensive Palaeozoic diamicitite of the Dwyka group, gneisses and metasediments of Mokolian age. The area is characterised by land type Ag and Ae, with red-yellow apedal soils forms.

According to the land type database (Land Type Survey Staff, 1972 - 2006) the assessment area to be focused on mainly falls within the Ag 3, Ag 61, Ag 25 and Ai 29 land types (Figure 3-2). The Ag 3, Ag 61, Ag 25 land types consist of Hutton and Mispah soil forms with the occurrence of other soils and rocky areas within the landscape. The Ai 29 land types consist of Clovelly and Oakleaf soil forms according to the Soil classification working group (1991), with the occurrence of other soils and rocky areas within the landscape. The Ag land types commonly have red and yellow apedal, freely drained soils. These soils are red, have high base status < 300 mm deep. The Ai land types are characterised with red- yellow apedal, freely drained, yellow , high base status usually < 15% clay. The land terrain

units for the featured land types are illustrated in Figure 3-3 and Figure 3-7, with the expected soils listed in Table 3-1 and

Terrain Units

1 (10%)		1 (1) (10%)		3 (1) (19%)		3 (8%)		4 (50%)			5 (8%)
Bare Rock	70%	Bare Rock	40%	Bare rock	50%	Hutton	50%	Hutton	60%	Hutton	70%
Mispah	30%	Hutton	30%	Mispah	30%	Mispah	30%	Mispah	30%	Dundee	20%
		Mispah	20%	Hutton	10%	Bare Rock	10%	Bare Rock	5%	Bare Rock	5%
		Glenrosa	10%	Glenrosa	10%	Glenrosa	10%	Glenrosa	5%	Mispah	5%
										Hutton	70%

Table 3-4.

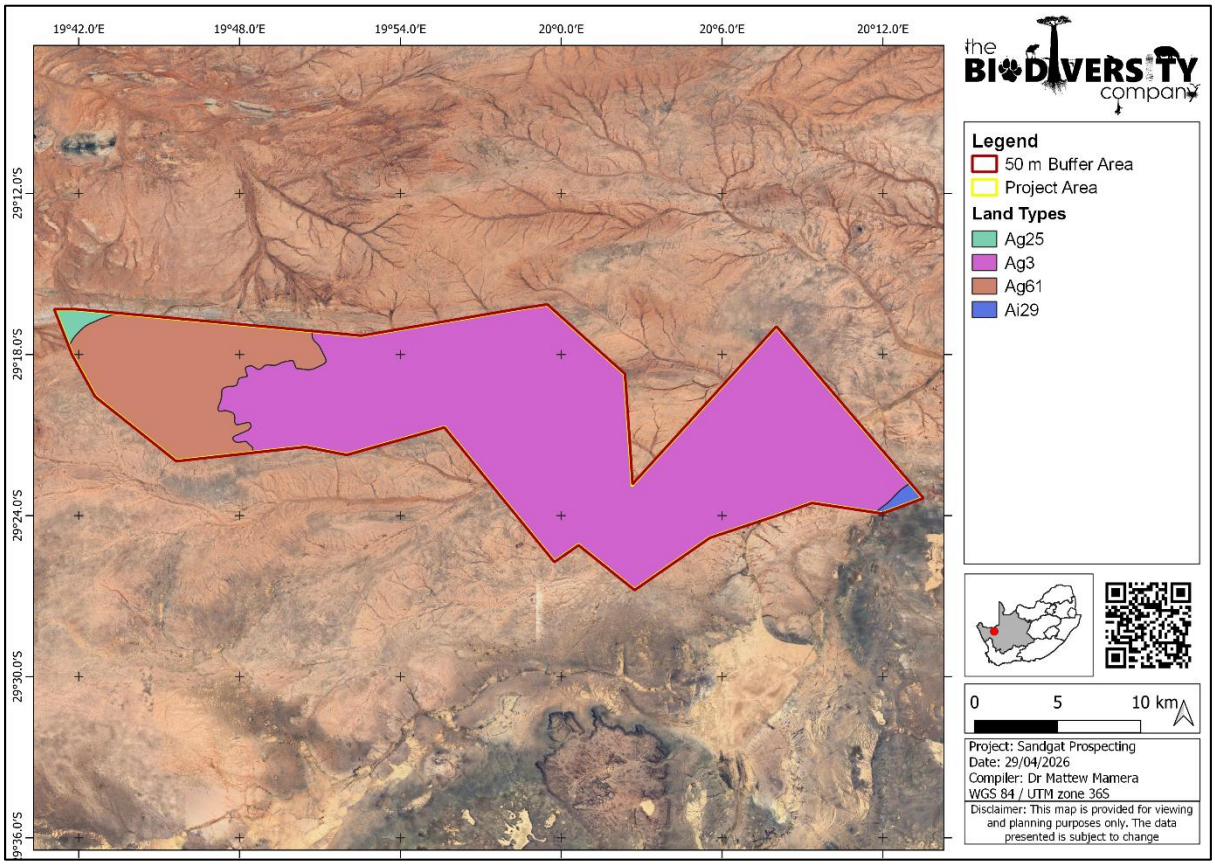


Figure 3-2 Land type associated with the proposed project area

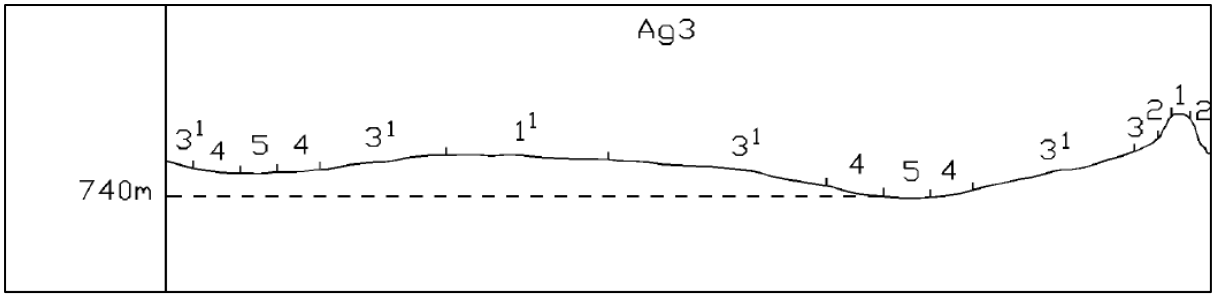


Figure 3-3 Illustration of land type Ag 3 terrain units (Land Type Survey Staff, 1972 – 2006)

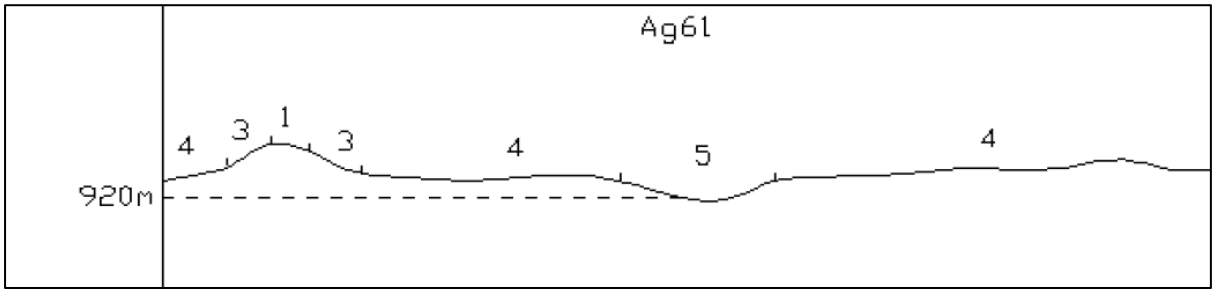


Figure 3-4 Illustration of land type Ag 61 terrain units (Land Type Survey Staff, 1972 – 2006)

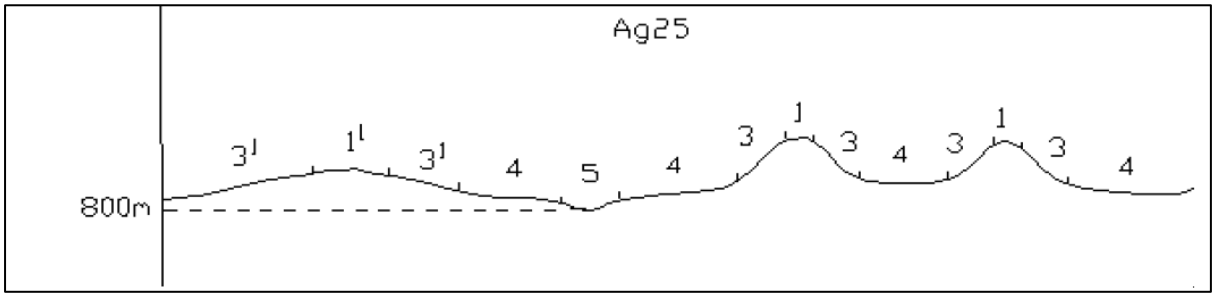


Figure 3-5 Illustration of land type Ag 25 terrain units (Land Type Survey Staff, 1972 – 2006)

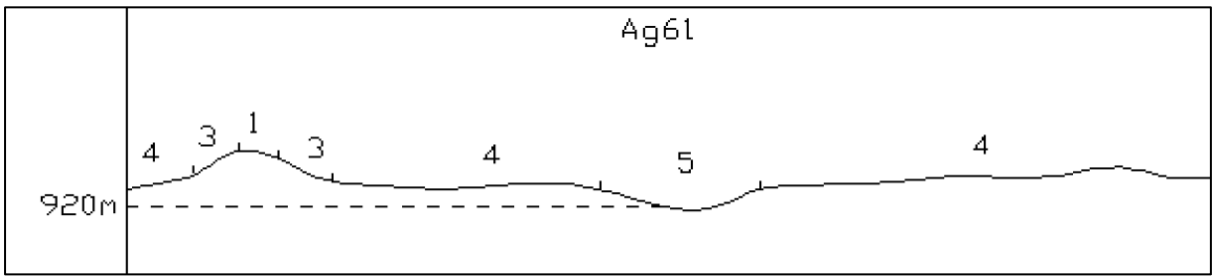


Figure 3-6 Illustration of land type Ai 29 terrain units (Land Type Survey Staff, 1972 – 2006)

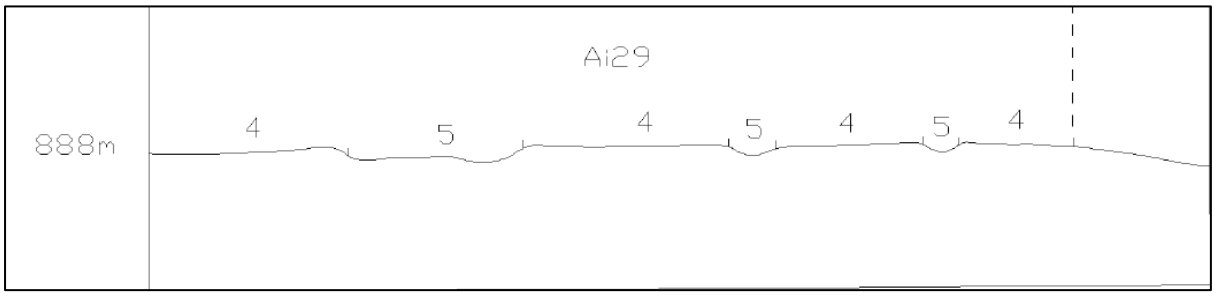


Figure 3-7 Illustration of land type Ib 252 terrain units (Land Type Survey Staff, 1972 – 2006)

Table 3-1 Soils expected at the respective terrain units within the Ag 3 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (20%)		3 (40%)		4 (30%)		5 (10%)	
Hutton	100%	Hutton	100%	Hutton	90%	Hutton	75%
				Mispah	20%	Mispah	25%

Table 3-2 Soils expected at the respective terrain units within the Ag 61 land type (Land Type Survey Staff, 1972 - 2006)

4 (88%)		5 (10%)	
Hutton	95%	Hutton	75%
Mispah	5%	Mispah	20%
		Oakleaf	5%

Table 3-3 Soils expected at the respective terrain units within the Ag 25 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units											
1 (10%)		**1 (1) (10%)**		**3 (1) (19%)**		**3 (8%)**		**4 (50%)**		**5 (8%)**	
Bare Rock	70%	Bare Rock	40%	Bare rock	50%	Hutton	50%	Hutton	60%	Hutton	70%
Mispah	30%	Hutton	30%	Mispah	30%	Mispah	30%	Mispah	30%	Dundee	20%
		Mispah	20%	Hutton	10%	Bare Rock	10%	Bare Rock	5%	Bare Rock	5%
		Glenrosa	10%	Glenrosa	10%	Glenrosa	10%	Glenrosa	5%	Mispah	5%
										Hutton	70%

Table 3-4 Soils expected at the respective terrain units within the Ai 29 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (10%)		**3 (70%)**		**4 (92%)**		**5 (8%)**	
Bare Rocks	90%	Bare Rocks	80%	Clovelly	63%	Oakleaf	50%
Mispah	10%	Mispah	10%	Mispah	21%	Clovelly	25%
		Glenrosa	10%	Glenrosa	11%	Mispah	9%
				Bare Rock	5%	Bare Rock	2%
						Glenrosa	1%

3.2 Baseline Findings

Three (3) representative soil forms identified within the proposed project area include the Clovelly, Oakleaf and Mispah soil forms (Figure 3-8). Based on the verified baseline findings, the proposed Sandgat Prospecting area was found to be dominated by shallow soil profiles. Such profiles are considered to have a low suitability, due to their depth restrictive for root penetration that extensively inhibits agricultural activities.

Furthermore, the proposed prospecting area is predominated with semi-impermeable to impermeable Mispah soil forms, with other areas characterised with Oakleaf and Clovelly soil forms. The Mispah soil form has an orthic topsoil on top of a hard rock layer below. The Oakleaf soil form consists of an orthic topsoil on top of a thick neocutanic subsoil horizon. The Clovelly soil form comprises of an orthic topsoil on top of a yellow brown apedal subsoil that is underlain by a lithic horizon. The Mispah soils are characterised by shallow restrictive depth, with an impermeable underlying parent material. Due to their restricted permeability, Mispah soils have limited root penetration and water movement, which inhibits crop production. Consequently, these soils have a low sensitivity and low productivity, suitable for grazing and supporting natural veld vegetation. The Oakleaf and Clovelly soil forms are characterised by apedal soils with freely drained upper horizons and restrictive underlying horizon. These soils are mostly suitable for shallow rooted crops and is considered to have a low to moderate agricultural use

depending on the climatic limitations. Some of the identified soil horizons within the proposed project area are illustrated in Figure 3-9 and Figure 3-10.

Land capability is defined as the combination of the slope class and soil morphological properties (i.e. topsoil texture, profile depth and permeability class of the upper soil layers). Accordingly, following Smith, (2006) which the national DAFF, (2017) land capabilities protocols were further expanded from, the above-mentioned identified soil forms are restricted to land capability classes IV (i.e. Clovelly and Oakleaf soil form) categorised by LC 6-7 (Low Moderate) and land capability VI (i.e. Mispah soil forms) categorised by LC 1-5 (Very low to Low). The baseline soil land capability was aligned and compared to the National Land Capability data (DAFF, 2017). A climate capability level 8 has been assigned to the area given the low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates.

Land potential is defined as the combination of the calculated land capability, the determined climate class of the area and the current land use activities. By using the determined land capability for the most sensitive soil (Clovelly and Oakleaf soil form) and the determined climate capability, a land potential of “L6” was calculated. Furthermore, the calculated land potential for less sensitive soils (i.e. Mispah soil forms) is land potential L7. According to Smith (2006), the “L6” land potential is characterised by very restricted potential with regular and or severe limitations due to soil, slope, temperature or rainfall. The “L7” land potential level is characterised by a low potential with a severe limitation due to soil, slope, temperatures, or rainfall. The areas associated with the “L6 and L7” land potentials are considered to be non-arable (Figure 3-11). Therefore, the proposed project area falls predominately on non-arable soils.

The following land potential levels have been determined;

- Land potential level 6 (this land potential is characterised by very restricted potential. Regular and/ or severe limitations due to soil, slope, temperatures or rainfall). Non-arable; and

- Land potential level 7 (this land potential is characterised by low potential. Severe limitations due to soil, slope, temperatures or rainfall). Non-arable.

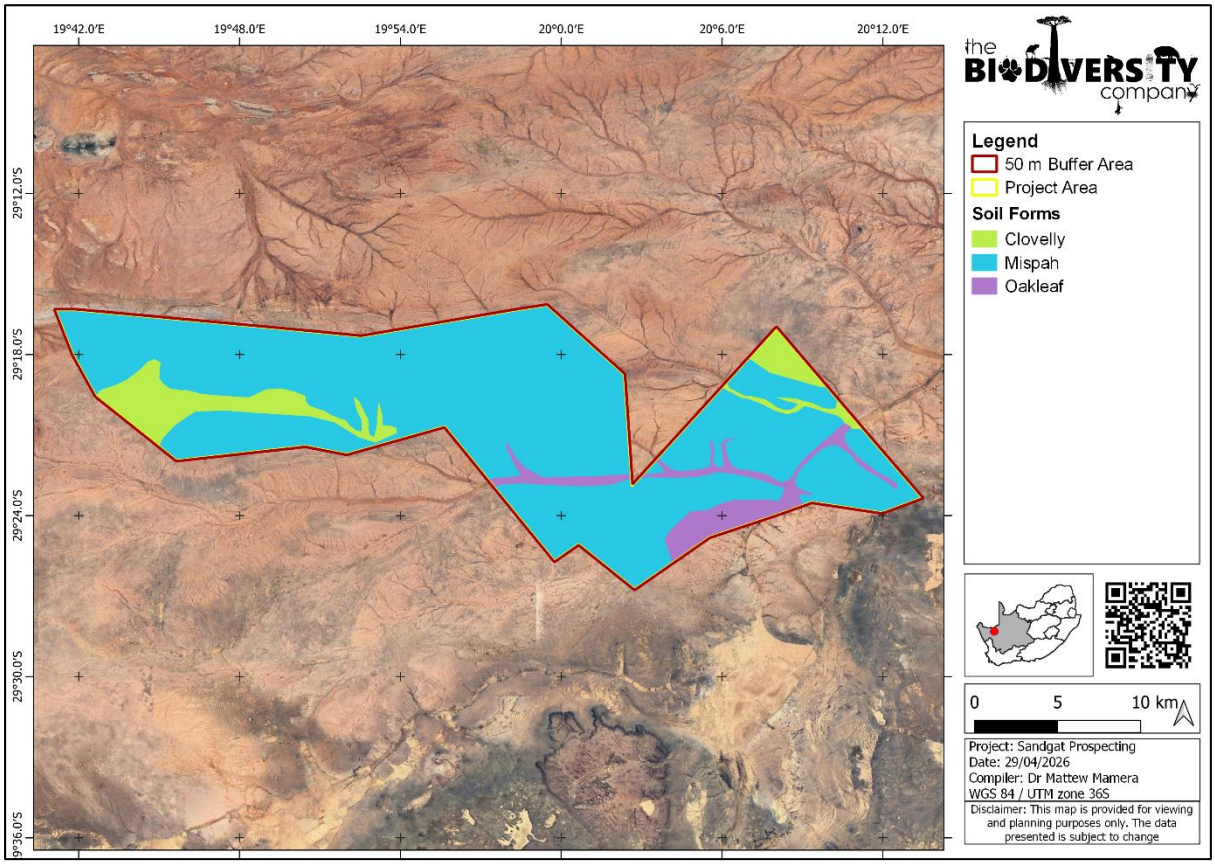


Figure 3-8 Soil forms found within the proposed project area

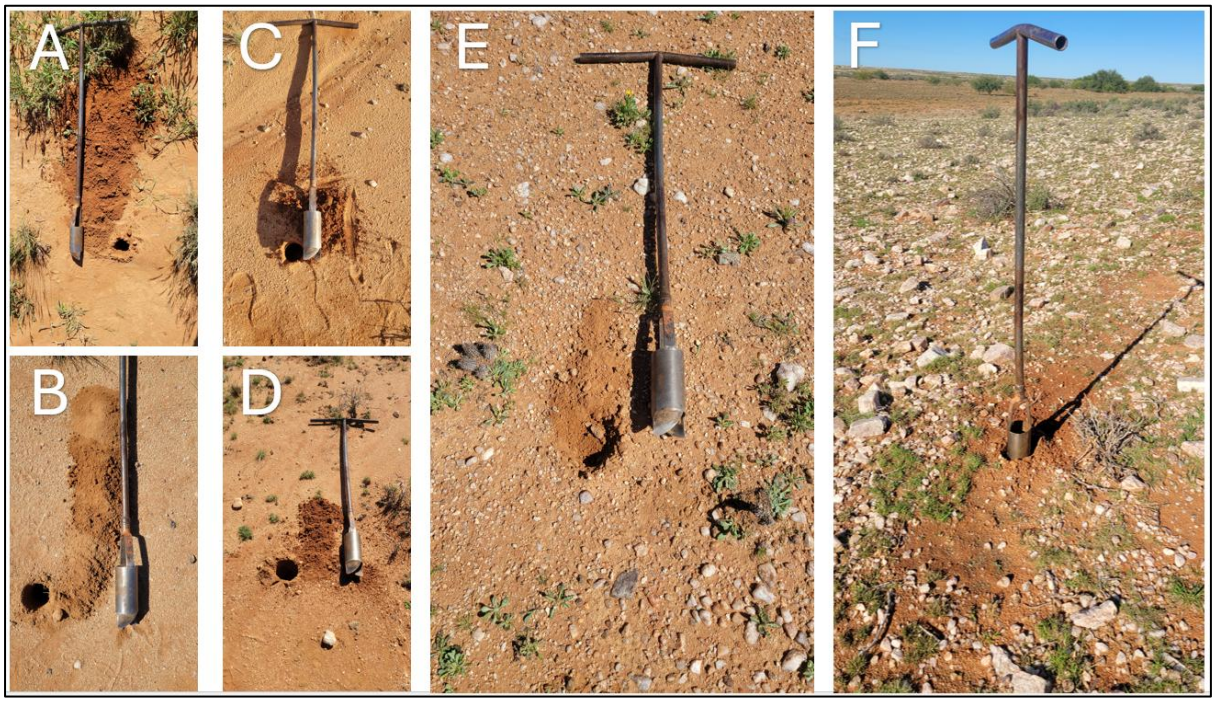


Figure 3-9 Soil forms found within the proposed project area; A) Clovelly soil form; B) Oakleaf soil form; and C-F) Mispah soil form

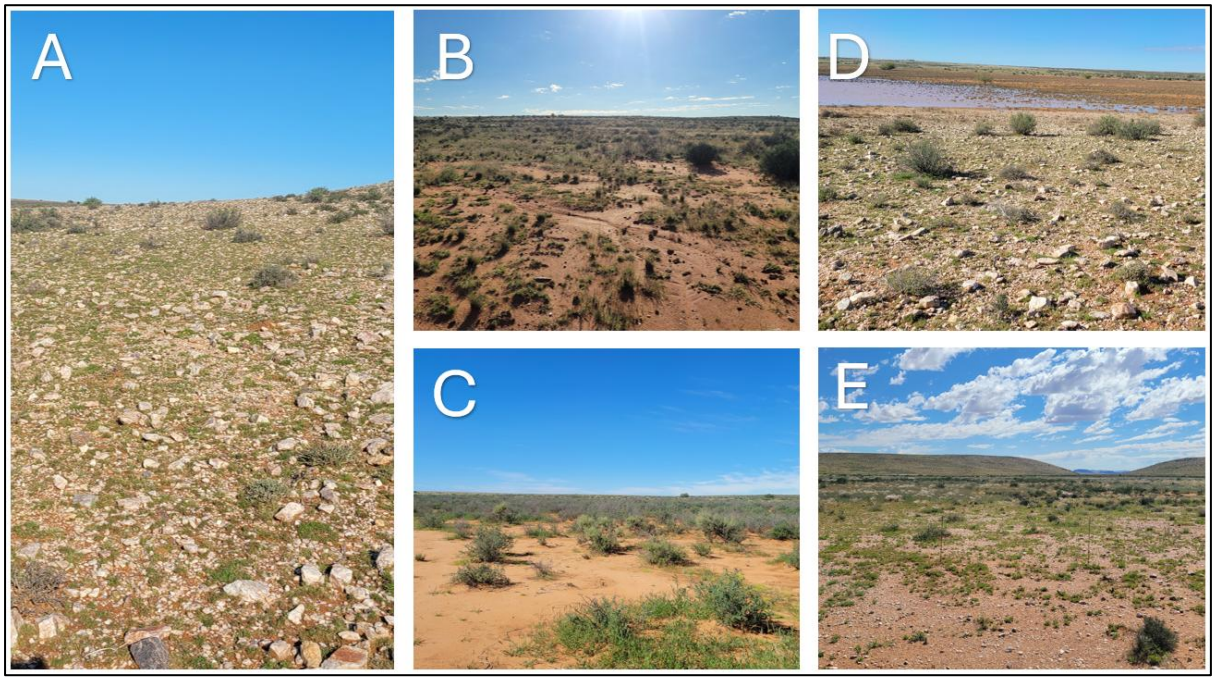


Figure 3-10 Different land uses found within the 50 m buffer of the proposed project area; A-E) Natural veld and Livestock grazing; D) Ephemeral pans

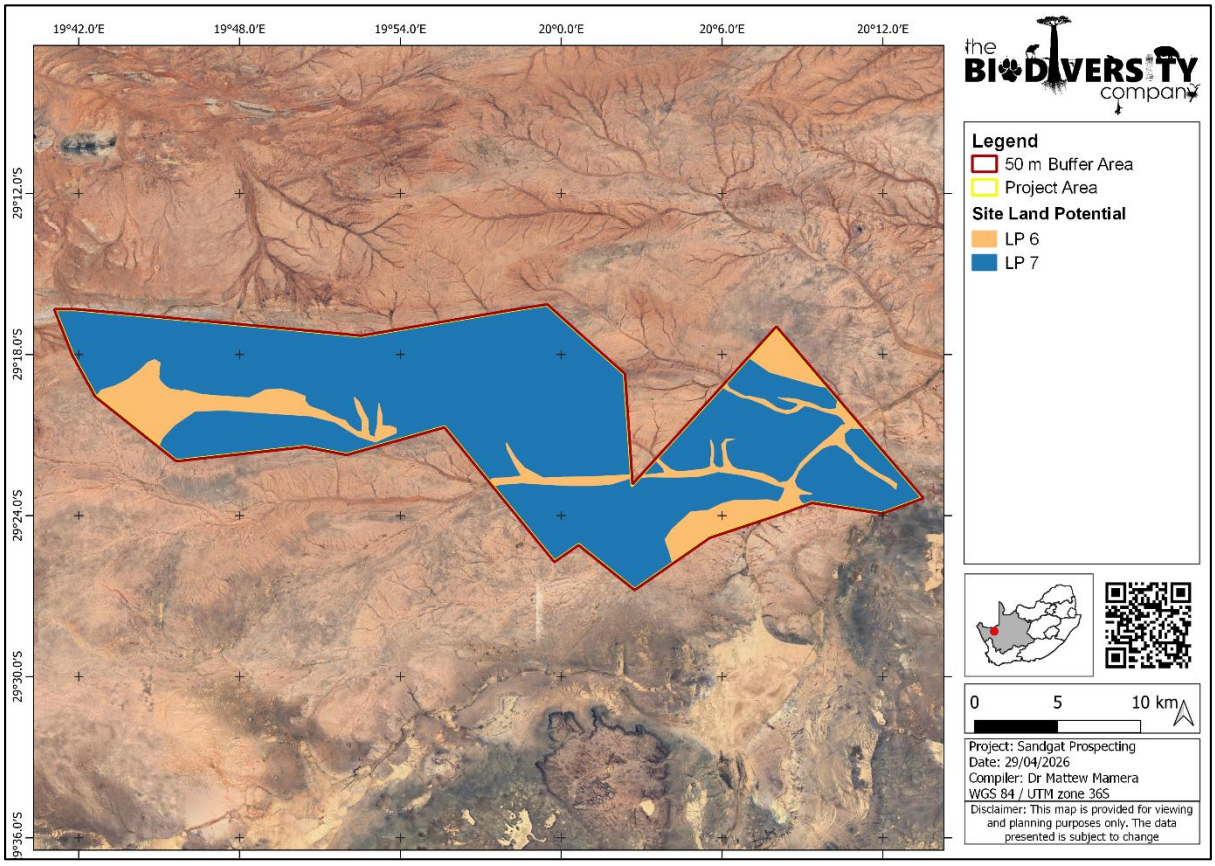


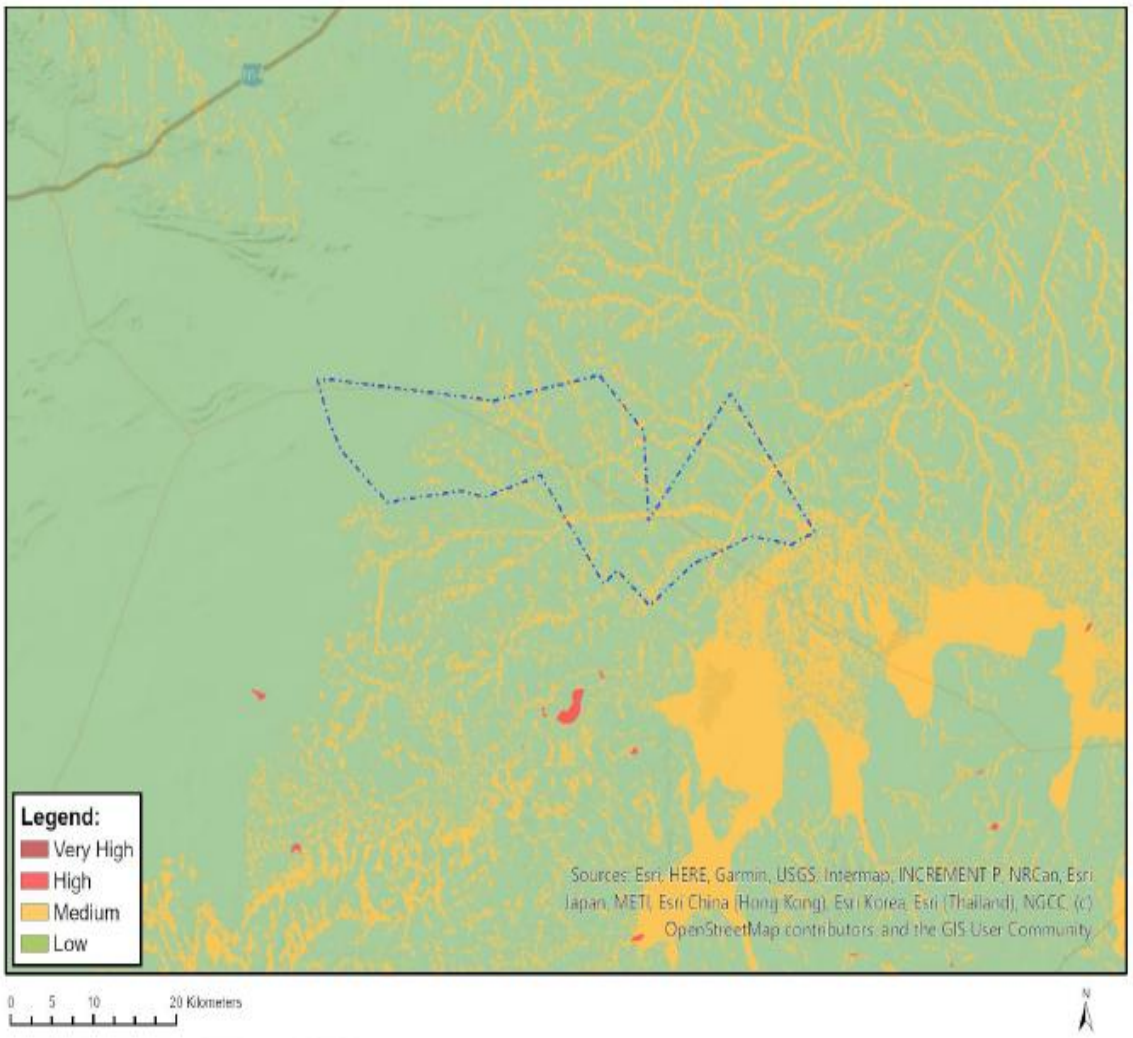
Figure 3-11 Land Potential of the proposed project area

3.3 Sensitivity Verification

3.3.1 Screening Report – Sandgat Prospecting Area

The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Agriculture Theme Sensitivity indicates that the proposed 50 m Buffer of the project area falls within the 'Low to Medium' agricultural sensitivity (Figure 3-12).



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	05. Low
Low	04. Low-Very low
Low	02. Very low
Low	03. Low-Very low
Medium	06. Low-Moderate
Medium	07. Low-Moderate

Figure 3-12 Map of Relative Agricultural Theme Sensitivity for the Sandgat Prospecting Right generated by the Environmental Screening Tool

Fifteen land capabilities have been digitised by (DAFF, 2017) across South Africa, of which one (1) potential land capability classes are located within the assessment area, including;

- Land Capability 2 to 5 (Very Low to Low Sensitivity); and
- Land Capability 6 to 7 (Low Moderate Sensitivity).

The land capability dataset (DAFF, 2017) indicates that the proposed project area falls predominately within the “Very low to Low” land capability sensitivity with some few areas with “Low Moderate” land capability sensitivity. No field crop boundaries or Protected Agricultural Areas (PAAs) were identified within the proposed project area, according to the agricultural screening tool (DFFE, 2026).

The baseline soil findings and the current land uses concur with the “Very low to Low” and the “Low Moderate” land capability sensitivity. Based on the verified findings, most identified land capability areas were found to be dominated by very low to low potential soils and low moderate for the Mispah soil form. Furthermore, the marginal confirmed low to moderate land capability areas are comprised of moderate potential soils i.e. Oakleaf and Clovelly soil form. No irrigation practices such as center pivots, sprinklers or irrigation canals were identified on-site. Hence, no segregation of soil resources is expected due to the prospecting activities.

The proposed project and the associated activities are expected to have acceptable changes to the soil resources, and they are anticipated to have minimal impact on the soil resources. Therefore, the overall site sensitivity of the proposed project area is concluded to be “Low” agricultural sensitivity.

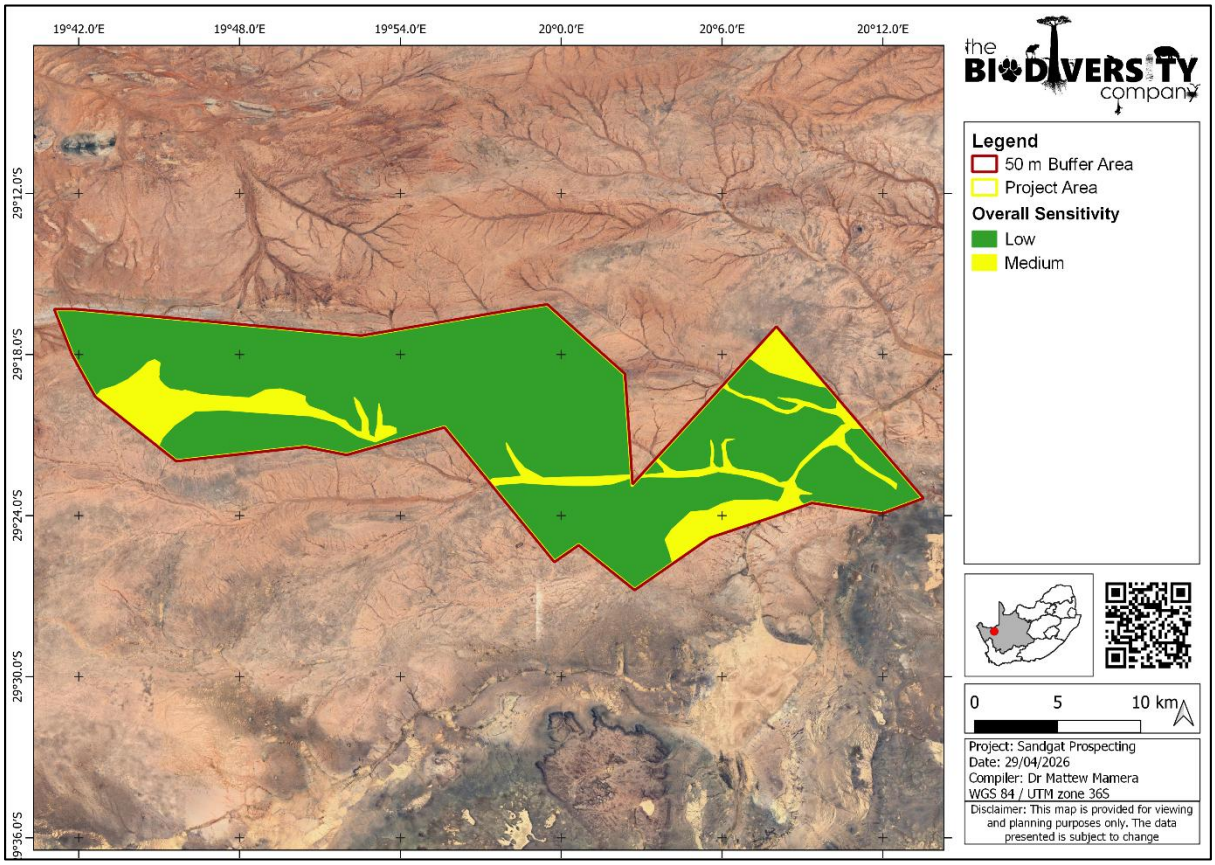


Figure 3-13 Overall site verified sensitivity of the proposed project area

Considering the soil properties, agricultural potential as well as the current land use of the proposed development area, the overall sensitivity of the proposed project area is categorized as “Low” sensitivity

with marginal “Medium” sensitivity. The allocated sensitivities for the theme are either disputed or validated in Table 3-5 below.

Table 3-5 Summary of the screening tool vs specialist assigned sensitivities

Screening Tool Theme	Feature	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Agricultural Theme	LC 6-7 Low to Moderate	Medium	Medium	Validated – Land Capability Low to Moderate. Presence of moderately potential soils including Oakleaf and Clovelly soil forms.
	LC 6-7 Low to Moderate	Medium	Low	Disputed – Land Capability Very Low to Low. The presence of restrictive soils including the Mispah soil forms
	LC 2- 5 Very low to Low	Low	Low	Validated. Land Capability Very Low to Low. The presence of restrictive soils including the Mispah soil forms

4 CARA Requirements

Under Conservation of Agricultural Resources Act (no. 43 of 1983, CARA), approvals are necessary for various activities, such as cultivating virgin land, veld burning, cultivating localized alien plants for commercial purposes and the draining of wetland systems.

For the cultivation of virgin land, CARA specifies that only arable land should be cultivated. However, disturbances to topsoil resulting from the construction of proposed activities does not fall under this category of cultivation as defined by CARA but rather soil disturbance. Therefore, the construction and operation of the camps do not require consent under CARA.

Additionally, since the proposed development does not involve veld burning or the commercial cultivation of localized alien plants, it does not require consents under those provisions of CARA.

Similarly, a specialist wetland assessment was undertaken for the required authorisations. The proposed layout and the associated infrastructures will have minimal impact on the available watercourses. Furthermore, the proposed project will not result in the direct draining of the water regimes due to the activities. The overall residual impact to the wetland systems was determined to be low. The project is compliant and will not require consent under CARA for any activities.

In summary, the proposed project and the associated infrastructure is compliant with CARA regulations and does not necessitate consent under the Act following the site confirmation.

5 Impact and Management Measures

5.1 Prospecting Activities Impact Assessment

In accordance with the requirements for Environmental Authorisation as per NEMA, an EIA assessment must take place to determine the potential state of the environment prior to development taking place as well as the likely impacts that the development may have on the area. The following list provides the identified impacts which may potentially contribute to the loss of land capability:

- Soil erosion: Bare soil surfaces within the proposed project area may contribute to increased susceptibility to wind and water erosion, leading to loss of topsoil;
- Soil compaction from vehicle traffic: The movement and operation of vehicles within the project footprint, may result in increased soil compaction, which would adversely affect soil structure and permeability;
- Soil contamination: Surface flow from temporary sanitation facilities and bunded diesel storage can lead to soil contamination, impacting soil health and productivity, and

- Soil compaction and degradation from the core drilling activities: The presence of temporary laydown camps, core drilling machinery, to mention the few may cause soil compaction and land degradation, disturbing soil structure and reducing overall soil quality.

The following table provides the framework for the prospective impacts, albeit limited, for the proposed project (Table 5-1).

Table 5-1 Summative results of the Impact Assessment conducted for the proposed project

Impact	Phase	Pre-Mitigation Impact	Post-mitigation Impact	Final Significance
Soil compaction, Soil erosion, Land degradation and Soil contamination	Construction	Medium to Low-	Low -	Low -
Loss of grazing potential	Construction	Medium to Low-	Low -	Medium to Low -
Mitigation Measures				
• Minimise project footprint as far as possible. Manage location of topsoil stripping stockpiling, demarcation of topsoil stockpiles and prevention of stockpile erosion and contamination for the drilling sites or boreholes. This can protect the topsoil stockpiles to keep it viable for rehabilitation purposes. • Make use of existing roads or upgrades tracks before new roads are constructed. The number and width of internal access routes must be kept to a minimum. Usually, areas with sandy soils are avoided as far as possible for heavy vehicles, areas dominated with sandy soils, dust suppressions methods should be implemented to reduce wind erosion during this phase; • Implementation of embedded controls such as geotextiles, mulching to effectively control soil erosion on-site; • Associated infrastructure foundations must be (preferably) located in already disturbed areas where possible; • Losses of fuel and lubricants from vehicles to be contained during the drilling activities, use of biodegradable fluids where possible, avoid waste disposal on undesigned areas which are not contained. • Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas. • Reduce the dust generated by operational vehicles and earth moving machinery, through wetting the soil surface (with “dirty water”) and putting up signs to enforce speed limits to enforce reduced speeds. • No non-environmentally friendly suppressants may be used as this could result in pollution of water sources. • Rehabilitation of the area must be initiated from the onset of the project; and • An alien invasive plant species and control programme must be implemented from the onset of the project.				
Soil compaction, Soil erosion, Land degradation and Soil contamination	Operation	Medium to low -	Low -	Medium to Low -
Loss of grazing potential	Operation	Medium to Low-	Low -	Low -
Mitigation Measures				
• Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas. • No non-environmentally friendly suppressants or cleaning agents may be used as this could result in pollution of water sources.				

• Rehabilitation of the area must be initiated from the onset of the project. Soil stripped from laydown camps or drilling sites placement can be used for rehabilitation efforts; and • An alien invasive plant species and control programme must be implemented from the onset of the project.				
Soil compaction, Soil erosion, Land degradation and Soil contamination	Decommissioning	Low -	Low -	low -
Loss of grazing potential	Decommissioning	Low -	Low -	low -
Mitigation Measures				
• Install erosion and sediment control measures (silt fences, sediment basins, straw bales) if erosion effects occur. • Remove infrastructure, like temporary office, laydown camps and sanitation facilities. Remove all above-ground and below-ground cabling, foundations, and concrete pads. • Remove hazardous materials (batteries, oils, chemicals) for proper disposal. • Decompact soils in areas affected by heavy machinery (use subsoiling or deep ripping). • Maintain erosion and sediment controls until vegetation is re-established • Document and report restoration outcomes to relevant authorities.				
Soil compaction, Soil erosion, Land degradation and Soil contamination	Rehab and Closure	Low -	Low -	Low -
Loss of grazing potential	Reb and Closure	Low -	Low -	low -
Mitigation Measure				
• Install erosion and sediment control measures (silt fences, sediment basins, straw bales). • Remove all prospecting debris and waste from the site. • Decompact soils in areas affected by heavy machinery (use subsoiling or deep ripping). • Replace and evenly spread any stripped topsoil. • Reseed or replant with native or pre-existing vegetation suited to the soil capability. • Maintain erosion and sediment controls until vegetation is re-established • Document and report restoration outcomes to relevant authorities.				

Table 5-2 Anticipated impacts for the proposed support infrastructure on agricultural resources

Main Impact	Project activities that can cause loss/impacts to Soils (especially regarding the proposed infrastructure areas)	Secondary impacts anticipated
Loss of land capability	• Construction, operation and decommissioning of core drilling sites and roads; • Construction, operation and decommissioning of construction camps, layout areas and office space; • Potential waste water treatment leaks or spillage (i.e. hydrocarbons or untreated waste); • Mixing of soil; • Soil dust precipitation in surface or gravel access roads; • Dust precipitation; and • Removal of vegetation for the proposed support infrastructure	• Erosion; • Soil degradation; • Compaction; • Increase in salinity; • Land contamination; and • Loss of soil via aeolian processes.

5.2 Management Measures

The assessment of impact significance considers pre-mitigation as well as implemented post-mitigation scenarios. The aim of the management outcomes (below) is to present the mitigation measures in such a way that they can be incorporated into the Environmental Management Programme (EMPr) for the project, allowing for more successful implementation and auditing of the mitigations and monitoring guidelines. The project management measures for the soils and agriculture resources during the construction phase presents the prescribed mitigation measures for construction phase for the assessment are presented in Table 5-3. Table 5-3 presents the prescribed mitigation for operational phase for the assessment. Table 5-3 presents the prescribed mitigation measures for the decommissioning, rehabilitation and closure phases for the assessment.

Table 5-3 Mitigation Measures and Management Outcomes

No	Mitigation Measures	Phase	Timeframe	Responsible Party for Implementation	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
Soi1	Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent areas	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Rehabilitation implemented	Implement a rehabilitation plan
Soi2	Make use of existing access routes as much as possible before new routes are considered. Any selected "new" route must be authorized, minimizing disturbances to the wetland areas.	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	All routes authorised	Design engineer to consider this for final layout
Soi3	Keep excavation and soil heaps clear of potential contaminates or waste	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Soil heaps are managed	Separate topsoil and sub-soil
Soi4	Lightly till any disturbed soil around the development footprint to avoid compaction	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Plan is implemented	Implement a rehabilitation plan
Soi5	Ensure soil stockpiles sand are sufficiently safeguarded against rain wash	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Plan is implemented	Implement soil management plan
Soi6	The use of herbicides is not recommended (opt for mechanical removal).	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Avoided buffer area	Demarcate buffer area
Soi7	Make sure all excess consumables are removed from site and deposited at an appropriate waste facility	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Restricted to demarcated area	Restrict to designated working/storage/service areas
Soi8	Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g., concrete) in such a way as to	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Restricted to demarcated area	Restrict to designated working/storage/service areas

	prevent them leaking and entering wetlands or buffer areas						
Soi9	Provide appropriate sanitation facilities for workers during the prospecting and service them regularly	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Ablution facilities provided and serviced	Provide service ablution for contractors/labour
Soi10	The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Plan is implemented	Implement waste management plan
Soi11	The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Plan is implemented	Implement spill response plan
Soi12	Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor/ Environmental Officer	Throughout phase	Plan is implemented	Implement spill response plan
Soi13	Implement erosion control methods like mulching, geotextile sheets, reduce soil compaction, chemical spills which can affect soil fertility.	Operational	From operational and ongoing throughout lifespan of mine	Environmental Officer	Throughout phase	Implement an alien vegetation management plan	Implement an alien vegetation management plan
Soi14	Ensure successful rehabilitation of areas disturbed during operation and these areas are stabilized to avoid impacts to adjacent areas	Operational Decommissioning and rehab	From operational and ongoing throughout lifespan of mine including Rehabilitation and closure Phase	Contractor/ Environmental Officer	Throughout phase	Implement soil re-vegetation, spillage or residual waste contamination rehabilitation plan	Should be assessed once a year for soil compaction, fertility, and erosion.
Soi15	Rehabilitation of the Project area will be undertaken, including the ripping of the compacted soil surfaces and establishment of vegetation.	Decommissioning and rehab	Rehabilitation and closure Phase	Contractor/ Environmental Officer	Throughout phase	Implement soil compaction rehabilitation	Implement erosion control, revegetation and alien vegetation management plan on disturbed areas

Soi16	Ensure rehabilitation of contaminated soil by removal of pollutants by implementing methods such as bioremediation and phytoremediation	Decommissioning and rehab	Rehabilitation and closure Phase	Contractor/ Environmental Officer	Throughout phase	Implement soil spillage or residual waste contamination rehabilitation plan	Should be assessed once a year for soil compaction, fertility, and erosion.

6 Conclusion

Three (3) soil forms were identified within the proposed project area namely; Oakleaf, Clovelly and Mispah soils. The proposed prospecting project area falls predominately on shallow soil profiles which are characterised by low potential soils. Areas in the prospecting area are comprised of restrictive soils including the Mispah soil forms, which are characterised by a low agricultural potential. Some of remaining areas within the proposed project area are also comprised of medium potential soils i.e. the Oakleaf and Clovelly soil forms due to the harsh climatic conditions. These areas are suitable for livestock grazing purposes.

The land capability sensitivity (DAFF, 2017) indicated that the proposed project area falls predominately within the “Very low to Low” land capability sensitivity. The verified baseline findings concur with all areas that were demarcated with a “Very low to Low” and “Low Moderate” land capability sensitivity which were confirmed. The prospecting activities will result in minimal losses to the identified soil resources and activities can occur.

It is the specialist’s opinion that the proposed project and the associated infrastructure will have an overall low residual impact on the agricultural production ability of the land. The proposed project and associate infrastructure may be favourably considered for development.

6.1 Specialist Statement

The proposed development area will have an overall low residual impact on the soil capability and agricultural production capability of the area. The proposed development can be favourably considered for authorisation. The following serves to substantiate this statement:

- The site verified land capability of the proposed project area is low;
- The agricultural potential of the area ranges is low;
- No active crop farming was only identified within the 50 m buffer of the project area; and
- The overall agricultural sensitivity for the project area is categorised as low sensitivity.

6.2 Statement Conditions

The project may be favourably considered for authorisation and is not subject to any conditions.

7 References

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8 Appendix Items

8.1 Appendix A: Methodology

8.1.1 Desktop Assessment

As part of the desktop assessment, baseline soil information was obtained using published South African Land Type Data. Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 - 2006). The land type data is presented at a scale of 1:250 000 and comprises of the division of land into land types.

8.1.2 Field Survey

The site was traversed on foot. A soil auger was used to determine the soil form/family and depth. The soil was hand augured to the first restricting layer or 1.2 m. Soil survey positions were recorded as waypoints using a handheld GPS. Soils were identified to the soil family level as per the "Soil Classification: A Taxonomic System for South Africa" (Soil Classification Working Group, 2018). Landscape features such as existing open trenches were also helpful in determining soil types and depth.

8.1.3 Land Capability

Land capability and agricultural potential will be determined by a combination of soil, terrain, and climate features. Land capability is defined by the most intensive long-term sustainable use of land under rain-fed conditions. At the same time an indication is given about the permanent limitations associated with the different land use classes.

Land capability is divided into eight classes, and these may be divided into three capability groups. Table 8-1 shows how the land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use increases from class I to class VIII (Smith, 2006).

Table 8-1 Land capability class and intensity of use (Smith, 2006)

Land Capability Class	Increased Intensity of Use									Land Capability Groups
I	W	F	LG	MG	IG	LC	MC	IC	VIC	Arable Land
II	W	F	LG	MG	IG	LC	MC	IC		
III	W	F	LG	MG	IG	LC	MC			
IV	W	F	LG	MG	IG	LC				
V	W	F	LG	MG						Grazing Land
VI	W	F	LG	MG						
VII	W	F	LG							
VIII	W									Wildlife
W - Wildlife		MG - Moderate Grazing			MC - Moderate Cultivation					
F- Forestry		IG - Intensive Grazing			IC - Intensive Cultivation					
LG - Light Grazing		LC - Light Cultivation			VIC - Very Intensive Cultivation					

The land potential classes are determined by combining the land capability results and the climate capability of a region as shown in the table below. The final land potential results are then described in the subsequent table.

Table 8-2 The combination table for land potential classification

Land capability class	Climate capability class							
	C1	C2	C3	C4	C5	C6	C7	C8
I	L1	L1	L2	L2	L3	L3	L4	L4
II	L1	L2	L2	L3	L3	L4	L4	L5
III	L2	L2	L3	L3	L4	L4	L5	L6
IV	L2	L3	L3	L4	L4	L5	L5	L6
V	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei
VI	L4	L4	L5	L5	L5	L6	L6	L7
VII	L5	L5	L6	L6	L7	L7	L7	L8
VIII	L6	L6	L7	L7	L8	L8	L8	L8

Table 8-3 The Land Potential Classes

Land potential	Description of land potential class
L1	Very high potential: No limitations. Appropriate contour protection must be implemented and inspected.
L2	High potential: Very infrequent and/or minor limitations due to soil, slope, temperatures, or rainfall. Appropriate contour protection must be implemented and inspected.
L3	Good potential: Infrequent and/or moderate limitations due to soil, slope, temperatures, or rainfall. Appropriate contour protection must be implemented and inspected.
L4	Moderate potential: Moderately regular and/or severe to moderate limitations due to soil, slope, temperatures, or rainfall. Appropriate permission is required before ploughing virgin land.
L5	Restricted potential: Regular and/or severe to moderate limitations due to soil, slope, temperatures, or rainfall.
L6	Very restricted potential: Regular and/or severe limitations due to soil, slope, temperatures, or rainfall. Non-arable
L7	Low potential: Severe limitations due to soil, slope, temperatures, or rainfall. Non-arable
L8	Very low potential: Very severe limitations due to soil, slope, temperatures, or rainfall. Non-arable

The land capability of the proposed footprint will be compared to the National Land Capability which was refined in 2014- 2016. The National Land Capability methodology is based on a spatial evaluation modelling approach and a raster spatial data layer consisting of fifteen (15) land capability evaluation values (Table 8-4), usable on a scale of 1:50 000 – 1:100 000 (DAFF, 2017). The previous system is based on a classification approach, with 8 classes (Table 8-1). Land capability and land potential will also be determined in consideration of the screening tool to ultimately establish the accuracy of the land capability sensitivity from (DAFF, 2017).

Table 8-4 National Land Capability Values (DAFF,2017)

Land Capability Evaluation Value	Land Capability Description
1	Very low
2	
3	Very Low to Low
4	
5	Low
6	Low to Moderate
7	
8	Moderate
9	Moderate to High
10	
11	High

12	High to Very High
13	
14	Very High
15	

8.2 EIMS Impact Assessment for the proposed activities - Loss of Land Capability

Pre-Mitigation												Post-Mitigation														
Aspect	Impact	Phase	Pre-Nature	Pre-Extent	Pre-Duration	Pre-Magnitude	Pre-Reversibility	Consequence	Pre-Probability	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-Nature	Post-Extent	Post-Duration	Post-Magnitude	Post-Reversibility	Consequence2	Post-Probability	Post-mitigation Significance Score	Post-Mitigation Significance	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score	Final Significance
Loss of Land Capability	Soil compaction, Soil erosion, Land degradation and Soil contamination	Construction	-1	3	3	3	3	-3	2	-6	Medium to low -	-1	2	2	2	3	-2,25	1	-2,25	Low -	Medium	2	3	1,38	-3,09	Low -
Loss of Land Capability	Soil compaction, Soil erosion, Land degradation and Soil contamination	Operation	-1	2	3	2	2	-2,25	2	-4,5	Medium to low -	-1	2	2	2	1	-1,75	1	-1,75	Low -	Low	2	3	1,38	-2,41	Low -
Loss of Land Capability	Soil compaction, Soil erosion, Land degradation and Soil	Decommissioning	-1	1	2	2	3	-2	2	-4	Low -	-1	1	2	1	3	-1,75	2	-3,5	Low -	Low	2	2	1,25	-4,38	Medium to low -

	contamination																								
Loss of Land Capability	Soil compaction, Soil erosion, Land degradation and Soil contamination	Rehab and Closure	-1	1	2	2	2	-1,75	2	-3,5	Low -	-1	1	2	1	2	-1,5	1	-1,5	Low -	Low	1	2	1,13	-1,69	Low -

8.3 EIMS Impact Assessment for the proposed activities - Loss of Land Grazing Potential

Pre-Mitigation											Post-Mitigation												
Aspect	Impact	Phase	Pre-Nature	Pre-Extent	Pre-Duration	Pre-Magnitude	Pre-Reversibility	Consequence	Pre-Probability	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-Nature	Post-Extent	Post-Duration	Post-Magnitude	Post-Reversibility	Consequence2	Post-Probability	Post-mitigation Significance Score	Post-Mitigation Significance	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score	Final Significance
Loss of Land Grazing Potential	Soil compaction, Soil erosion, Land degradation and Soil contamination	Construction	-1	3	2	3	3	-2,75	2	-5,5	Medium to low -	-1	2	2	2	3	-2,25	1	-2,25	Low -	Medium	2	2	1,25	-2,81	Low -
Loss of Land Grazing Potential	Soil compaction, Soil erosion,	Operation	-1	2	3	2	2	-2,25	2	-4,5	Medium to low -	-1	2	2	2	1	-1,75	2	-3,5	Low -	Low	2	2	1,25	-4,38	Medium to low -

	Land degradation and Soil contamination																								
Loss of Land Grazing Potential	Soil compaction, Soil erosion, Land degradation and Soil contamination	Decommissioning	-1	1	2	2	2	-1,75	2	-3,5	Low -	-1	1	2	1	2	-1,5	1	-1,5	Low -	Low	1	2	1,13	-1,69	Low -
Loss of Land Grazing Potential	Soil compaction, Soil erosion, Land degradation and Soil contamination	Rehab and Closure	-1	1	2	2	2	-1,75	2	-3,5	Low -	-1	1	2	1	2	-1,5	1	-1,5	Low -	Low	1	2	1,13	-1,69	Low -

8.4 Appendix C: Specialist Declarations

DECLARATION

I, Matthew Mamera, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of Section 24F of the Act.

Dr Matthew Mamera

Soil Scientist

The Biodiversity Company

April 2026

I, Masilabela Seepamore, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of Section 24F of the Act.

Masilabela Seepamore

Soil Scientist

The Biodiversity Company

April 2026

8.5 Appendix D: Curriculum Vitae

Matthew Mamera

Pr Sci Nat 116356 +27 785 772 668 matthew@thebiodiversitycompany.com

PROFILE SUMMARY

Environmental and ecological specialist with 10 years' consulting experience, with international working experience. Specialist experience in project exploration, mining, engineering, hydropower, renewable energy, and private sector developments. Project management of national and international multi-disciplinary projects. Provides specialist guidance, technical support, and facilitation for compliance with in-country legislative requirements and international lender standards. Registered Pr Sci Nat with the South African Council for Natural Scientific Professions and the Soil Science Society of South Africa.

PERSONAL INFO

Nationality: South African Permanent Residence

Date of birth: 31 October 1988

EXPERIENCE

- Environmental Impact Assessments (EIA)
- Soil taxonomic classification (SA forms and WRB groups)
- Soil Hydropedology, Agricultural and Land contamination assessments
- Soil Carbon credits

SKILLS

- ✓ Soil and Soil Hydropedology Assessments
- ✓ Agricultural, soil and water contamination Assessments
- ✓ Rehabilitation
- ✓ Monitoring & Management Plans

LANGUAGES

English – Proficient

Zulu, Xhosa, Ndebele, Sotho – Conversational

Afrikaner - Basic

Signed: Dr Matthew Mamera

ACADEMIC QUALIFICATIONS

University of the Free State (2021): Doctor of Philosophy (PhD) - Soil Science:
Title: *Assessing pollution and managing faecal sludge through biochar applications in Phuthaditjhaba, South Africa.*

University of the Fort Hare (2018): Master of Science (MSc) - Soil Science:
Title: *Pollution potential of on-site dry sanitation systems associated with the Mzimvubu Water Project, Eastern Cape, South Africa.*

University of the Fort Hare (2015): Bachelor of Science Honours *Cum laude* (Hons) – Soil Science

University of the Fort Hare (2001 - 2004): Bachelor of Science Agriculture in Soil Science. Majors: Soil Science.

PROFESSIONAL EXPERIENCE

Mar 2022 – Present	**The Biodiversity Company** Soils Unit Manager / Soil & Soil Hydropedology
Feb 2018 – Dec 2020	**University of the Free State** Junior Researcher, lecturer / Soil Science
Jan 2015 – Dec 2017	**University of Fort Hare** Junior Research, Tutor / Soil Science

INTERNATIONAL EXPERIENCE

Angola, Botswana, Namibia, Zambia, South Africa

Masilabela Seepamore

Pr Sci Nat 113907 +27 78 815 1878 masilabela@thebiodiversitycompany.com

PROFILE SUMMARY

Soil and Agricultural specialist with ~ 3 years' consulting experience. Specialist experience in project exploration, mining, engineering, hydropower, renewable energy, and private sector developments. Project management of national I multi-disciplinary projects. Provides specialist guidance, technical support, and facilitation for compliance with in-country legislative requirements and international lender standards. Registered Pr Sci Nat with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African

Date of birth: 08 June 1988

EXPERIENCE

Environmental Impact Assessment (EIA)

Environmental Management Programmes (EMP)

Rehabilitation Plans

Agricultural potential assessments

Soil taxonomy classification (SA form)

SKILLS

- ✓ Soil Classification
- ✓ Project Management
- ✓ Soil & Crop Management
- ✓ Monitoring & Management Plans

LANGUAGES

English – Proficient

Afrikaans & IsiZulu – Conversational

Tswana, Sesotho, Sepedi - Proficient

Signed: Masilabela Seepamore

ACADEMIC QUALIFICATIONS

FERTALIZER ASSOCIATION OF SOUTHERN AFRICA (FERTASA) (2021) – Fertilizer Advisory Certificate & Training Scheme (FACTS)

University of the Free State (2019): MAGISTER SCIENTIAE (MSc) *Cum Laude* – Soil Science:
Title: *Impact of long-term production management practices on wheat grain yield under a semi-arid climate.*

University of the Free State (2015): BACCALAUREUS SCIENTIAE AGRICULTURAE Honores (Hons) – Soil Science.
University of the Free State (2013): BACCALAUREUS SCIENTIAE AGRICULTURAE. Majors: Agronomy & Soil Science.

PROFESSIONAL EXPERIENCE

Sep 2023 – Present	**The Biodiversity Company** Soil Ecologist
Nov 2022 – Aug 2023	**ARC-NRE** Intern
Mar 2021 – Sep 2021	**Central University of Technology** Lecturer (Part-Time)
July 2016 – Dec 2018	**University of the Free State** Research Assistant

INTERNATIONAL EXPERIENCE

South Africa