Grid Connection Infrastructure, including 132kV Overhead Power Line, Switching Station and Ancillaries, for the Great Karoo Wind Farm – Agricultural Compliance Statement

Sutherland, Northern Cape

November 2020

Client

Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

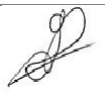
Report Name	**Grid Connection Infrastructure, including 132kV Overhead Power Line, Switching Station and Ancillaries, for the Great Karoo Wind Farm – Agricultural Compliance Statement**
Reference	**Great Karoo Wind Farm OHL**
Submitted to	savannah environmental
Report Reviewer	**Andrew Husted**  Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.
Report Writer and Fieldwork	**Ivan Baker**  Ivan Baker is Cand. Sci Nat registered (119315) in environmental science and geological science. Ivan is a wetland and ecosystem service specialist, a hydropedologist and pedologist that has completed numerous specialist studies ranging from basic assessments to EIAs. Ivan has carried out various international studies following FC standards. Ivan completed training in Tools for Wetland Assessments with a certificate of competence and completed his MSc in environmental science and hydropedology at the North-West University of Potchefstroom.
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. 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 to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

Table of Contents

Figures

Tables

Document Guide

According to the Government Notice 320 dated 20 March 2020 and the 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, the following criteria is applicable to that of an agricultural compliance statement;

Requirement	Page/ section
Specialist Details and CV	Appendix A
Locality of the proposed activity	Section 2
Sensitivity verification	Section 8.2
Acceptability of impacts towards agricultural production capability associated with proposed activities	Section 9
Declaration of specialist(s)	Page vii
Project components with 50 m regulated area superimposed to that of the agricultural sensitivities of the screening tool	Section 8.2
Confirmation from specialist that mitigation to avoid fragmentation has been considered	Section 9.1
Statement from specialist regarding the acceptability and approval of proposed activities	Section 9.2
Conditions to acceptability of proposed activities	
Probability of land being returned to current state after decommissioning	N/A
Monitoring requirements and/or any inclusions into EMPr	Section 9.1
Assumptions and uncertainties	Section 4

DECLARATION

I, **Ivan Baker** 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 71 and is punishable in terms of Section 24F of the Act.

Ivan Baker

Soil Specialist

The Biodiversity Company

November 2020

1 Introduction

The Biodiversity Company was appointed to conduct an agricultural compliance statement for the development of specific grid connection infrastructure required to connect and evacuate the generated power of the authorised Great Karoo Wind Farm to the national electricity grid

Great Karoo Wind Farm (Pty) Ltd, proposes the development of specific grid connection infrastructure required to connect and evacuate the generated power of the authorised Great Karoo Wind Farm (DEA Ref No. 12/12/20/2370/3) to the national electricity grid. Following consultation with Eskom, it has been confirmed that the Great Karoo Wind Farm must connect to the Hidden Valley substation located at the ACED Renewables Hidden Valley (Karusa) Wind Farm, which is currently under construction, to the west of Great Karoo Wind Farm. The project is located ~44km south of Sutherland and ~50km north of Matjiesfontein within the Northern Cape Province and falls within the Namakwa District Municipality and the Karoo Hoogland Local Municipality (see Figure 1-1).

The grid connection infrastructure required includes a switching station (up to 100m x 100m which is 2ha) to be developed adjacent to the authorised Great Karoo Wind Farm on-site substation. A 132kV double- or single-circuit overhead powerline, with a length of up to 14km, will connect the proposed switching station to the Eskom Hidden Valley substation. The pylon structures of the power line will be up to 32m high and the power line will be developed within the servitude of up to 40m wide.

A grid connection corridor of 300m has been identified for the power line, which widens to ~740m wide for the eastern section. A 500m assessment area around the wind farm substation has been considered for the placement of the switching station. Collectively, these assessment areas are referred to as the “development envelope”. The proposed infrastructure will be appropriately placed within the development envelope, outside of identified environmental sensitive areas.

Where possible, the switching station will be accessed via the authorised access road to the Great Karoo Wind Farm substation. However, where this is not feasible during construction a service track along the length of the power line servitude, of up to 6m wide, will be required to allow for large crane movement. This track will be rehabilitated following construction to a typical ‘jeep’ track (i.e. off-road track) for use during operation. Other associated infrastructure includes drainage line crossing infrastructure (culverts) and temporary laydown area/s that will be rehabilitated upon completion of the construction phase.

The grid connection infrastructure will be located within three affected properties:

- Farm Kentucky No. 206;
- Portion 1 of the Farm Orange Fontein No. 203; and
- Remaining Extent of the Farm De Hoop No. 202.

The approach adopted for the assessment of the proposed development has taken cognisance of the recently published Government Notice 320 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".

This report aims to present and discuss the findings from the soil resources identified on-site (i.e. within the proposed grid connection corridor), the agricultural and land potential of these resources, the land uses within the project area as well as the risk associated with the proposed powerline and switching station development.

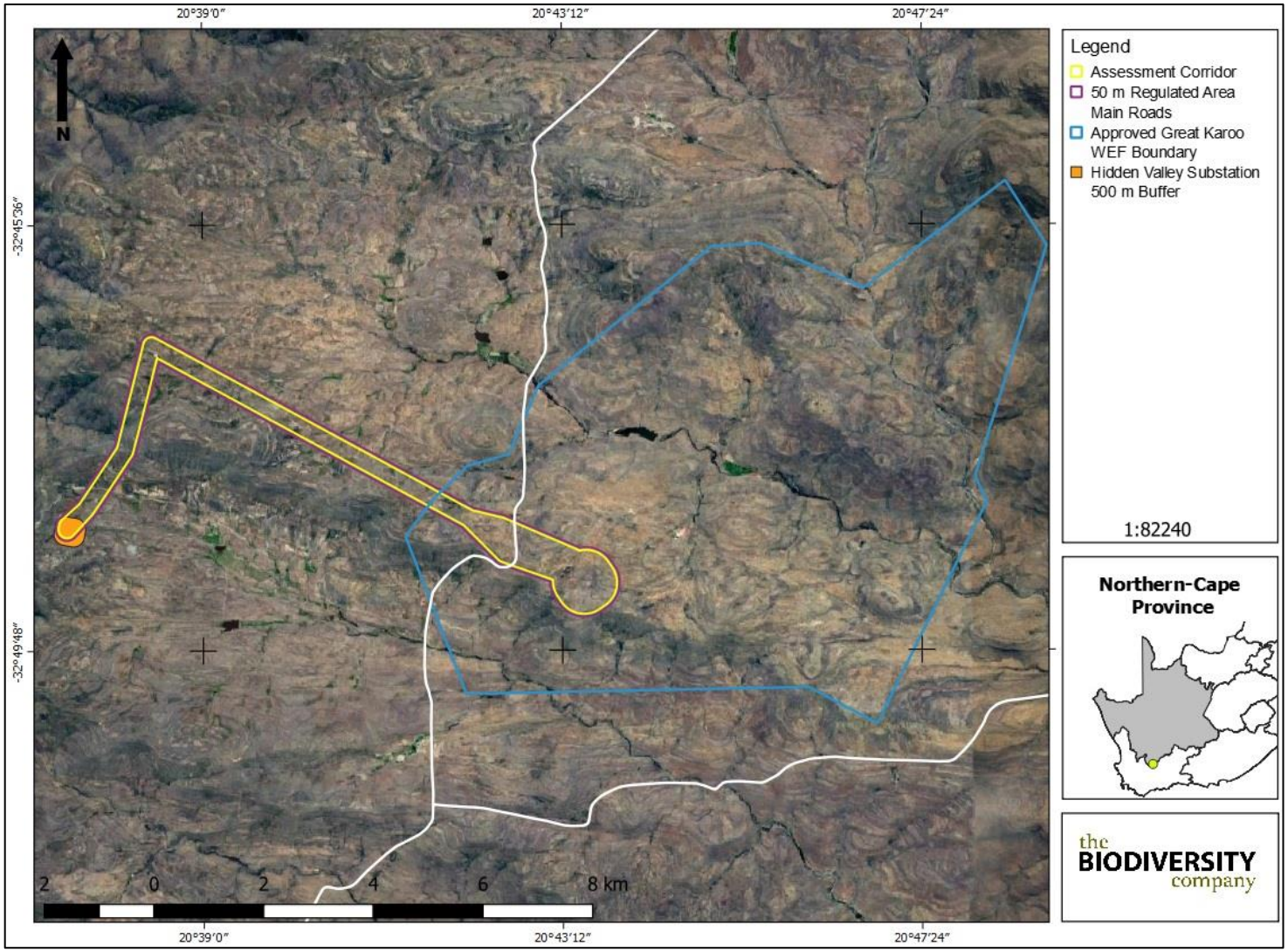


Figure 1-1 Locality map of the project area, indicating the assessment corridor being considered for the grid connection infrastructure

2 Project Area

The project area is located approximately 42 km south of Sutherland and 44 km north-west of Laingsburg within the Northern Cape Province. The surrounding land uses include farming (predominantly grazing), wind farms, mountainous areas and watercourses (see Figure 1-1).

3 Scope of Work

According to the National Web based Environmental Screening Tool, the proposed development corridor is located within “Medium” and “Low” sensitivities. The protocols for minimum requirements (DEA, 2020) stipulates that in the event that a proposed development is located within “Low” or “Medium” sensitivities, an agricultural compliance statement will be sufficient. It is worth noting that according to these protocols, a site inspection will still need to be conducted to determine the accuracy of these sensitivities. After acquiring baseline information pertaining to soil resources within the relevant corridor, it is the specialist’s opinion that the soil forms and associated land capabilities concur with the sensitivities stated by the screening tool.

It is however worth noting that a “High” sensitivity area is located between the assessment corridor and the 50 m regulated area, this feature has been detected by means of the Field Crop Boundary Sensitivity shapefile from the DEA screening tool. This system has been identified to rather be associated with a high sensitivity land use than land capability, given the extreme limitations in climatic capability in the area.

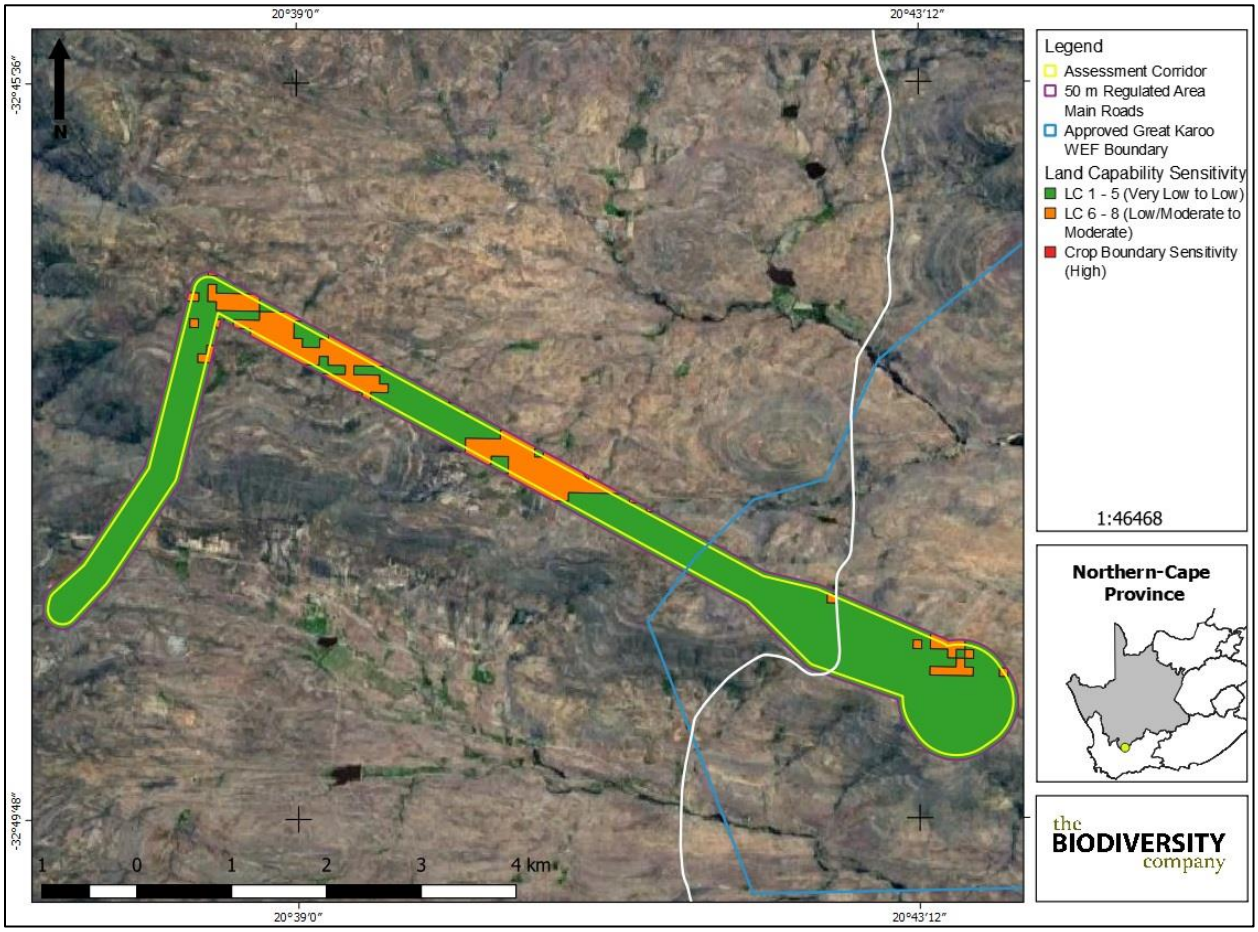


Figure 3-1 Agricultural sensitivities (DEA Screening tool)

Therefore, only an agricultural compliance statement will be compiled. This includes;

- The feasibility of the proposed activities;
- Confirmation of the “Low” and “Medium” sensitivities;
- The effects that the proposed activities will have on agricultural production in the area;
- A map superimposing the proposed footprint areas, a 50 m regulated area as well as the sensitivities pertaining to the screening tool;
- Confirmation that no agricultural segregation will take place and that all options have been considered to avoid segregation;
- The specialist’s opinion regarding the approval of the proposed activities; and
- Any potential mitigation measures described by the specialist to be included in the EMPr.

4 Limitations

The following limitations are relevant to this agricultural compliance statement;

- The focus of the site visit has been placed on the northern portion of the powerline as opposed to that to the east due to the fact that the eastern portion already has been assessed and has been determined to have “Low” and “Medium” sensitivities as indicated by the screening tool (see Figure 4-1);
- The eastern portion of the powerline will follow the same routing as the Gunstfontein overhead line (OHL) which had previously been assessed for a separate application. The agricultural compliance statement completed by TerraAfrica (2020) for this portion of the powerline was considered to supplement the findings of this assessment, allowing for coverage of the entire route.
- Given the size of the assessment corridor and the difficulty in accessing some of the portions within the assessment corridor, some extrapolation has been made from groundtruthed areas and areas that were not accessed; and
- The handheld GPS used potentially could have inaccuracies up to 5m.

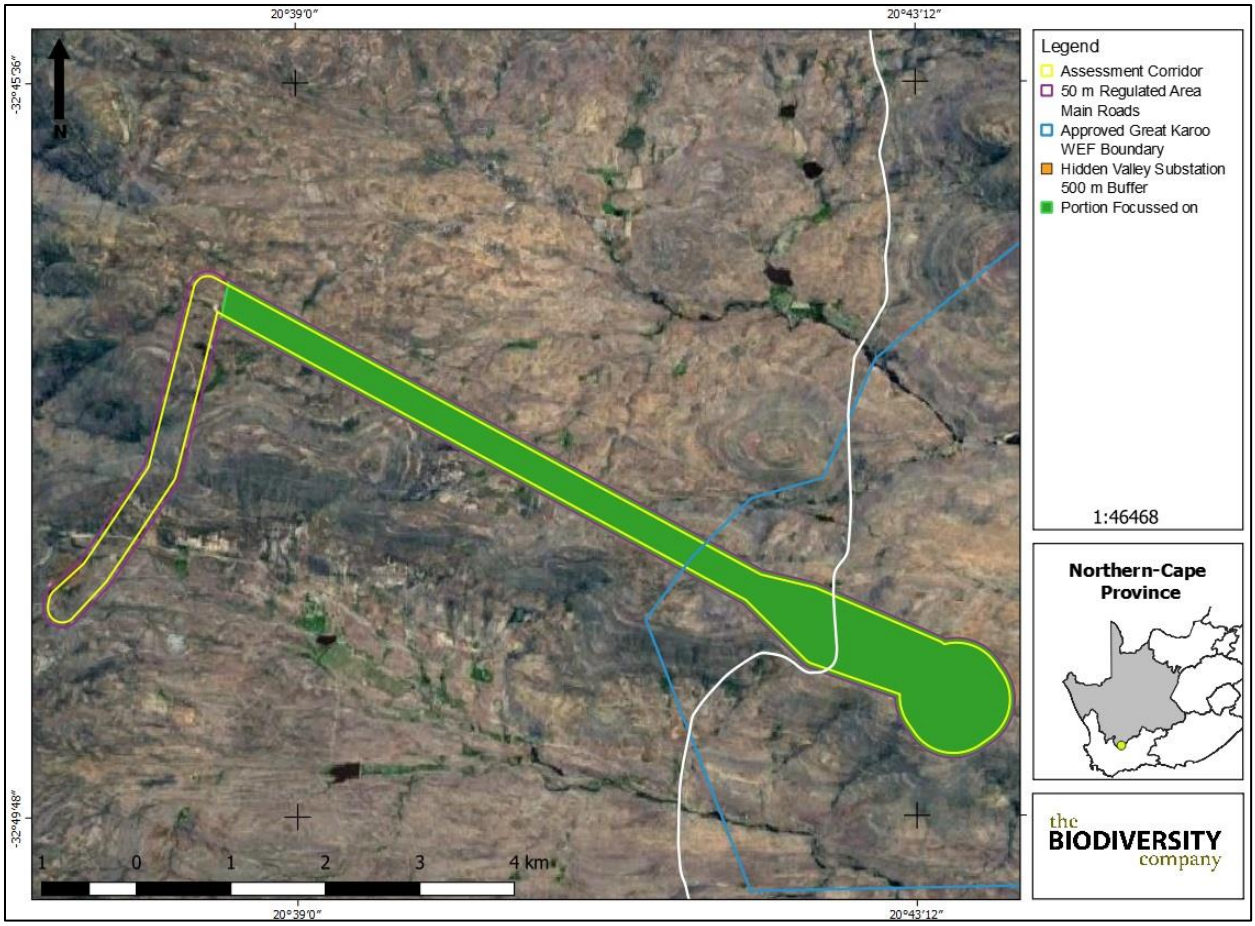


Figure 4-1 Portion of powerline covered for this particular assessment

5 Expertise

5.1 Andrew Husted

Mr. Andrew Husted is a Pr Sci Nat registered (400213/11) specialist in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Mr Husted has in excess of 12 years' experience in the environmental consulting field. This experience includes specialist freshwater ecology, with supporting services to pedology, hydrology and also hydropedological projects.

5.2 Ivan Baker

Ivan Baker is Cand. Sci Nat registered (119315) in environmental science and geological science. Ivan is a wetland and ecosystem service specialist, a hydropedologist and pedologist that has completed numerous specialist studies ranging from basic assessments to EIAs. Ivan has carried out various international studies following FC standards. Ivan completed training in Tools for Wetland Assessments with a certificate of competence and completed his MSc in environmental science and hydropedology at the North-West University of Potchefstroom.

6 Methodology

6.1 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. In addition, a Digital Elevation Model (DEM) as well as the slope percentage of the area was calculated by means of the NASA Shuttle Radar Topography Mission Global 1 arc second digital elevation data by means of QGIS and SAGA software.

6.2 Field Survey

A study of the soils present within the project area/corridor was conducted during a field survey from the 14th to the 16th of September 2020. The site was traversed by vehicle and 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 1,5m. 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.

6.3 Land Capability

Given the nature of the compliance statement and the fact that baseline findings correlate with the screening tool’s sensitivities, land capability was solely determined by means of the National Land Capability Evaluation Raster Data Layer (DAFF, 2017). Land capability and land potential will also briefly be calculated to match that of the screening tool to ultimately determine the accuracy of the land capability sensitivity from DAFF, 2017.

Land capability and agricultural potential will briefly 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 6-1 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 6-1 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 Table 6-2. The final land potential results are then described in Table 6-3.

Table 6-2 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 6-3 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

7 Project Area

7.1 Soils and Geology

According to the land type database (Land Type Survey Staff, 1972 - 2006) the proposed footprint area to be focused on falls within the Fc265 and Ib228 land types. The Fc land type consists of Glenrosa and/or Mispah soil forms with the possibility of other soils occurring throughout. Lime is rare or absent within this land type in upland soils but generally present in low-lying areas. The Ib land type consists of miscellaneous land classes including rocky areas with miscellaneous soils.

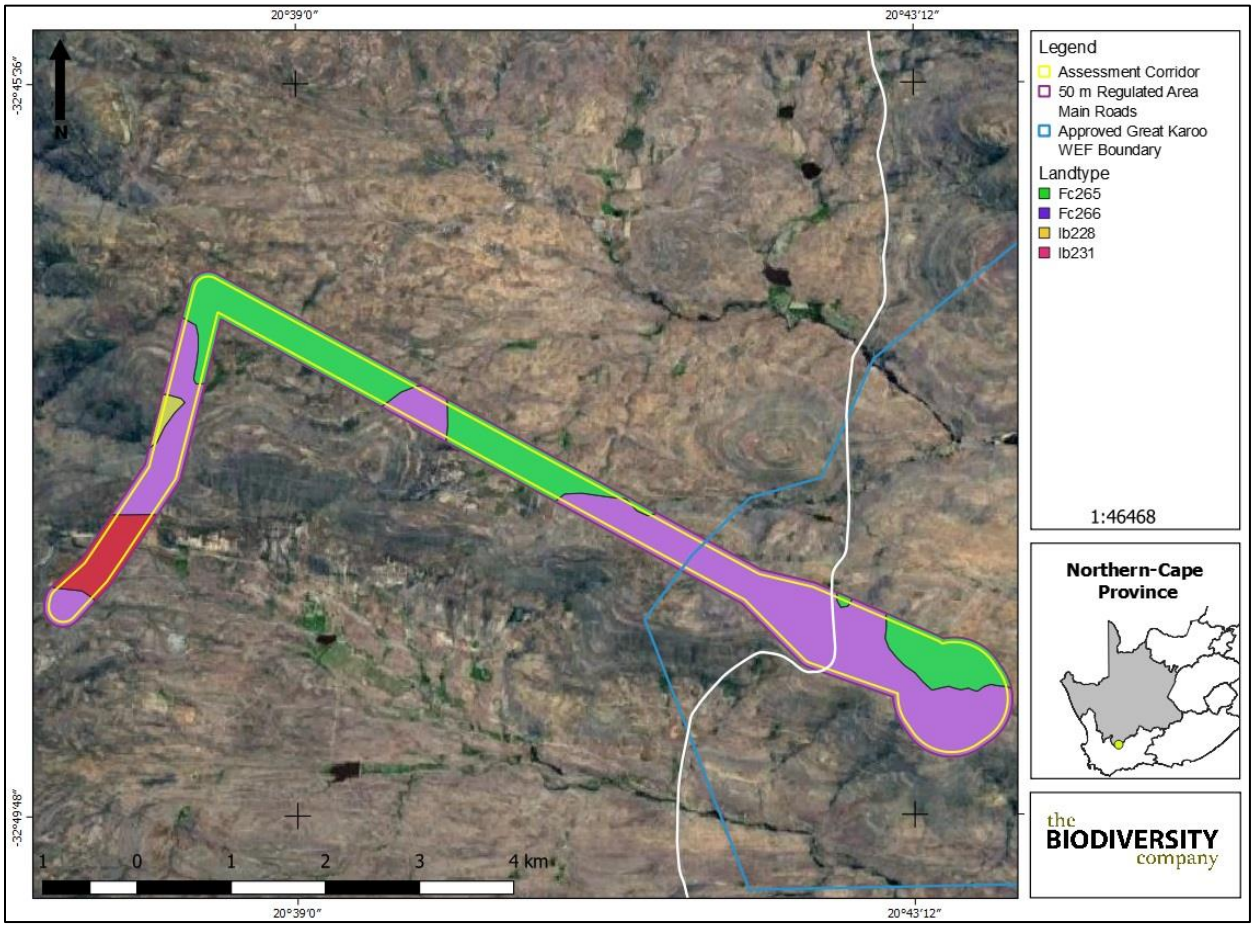
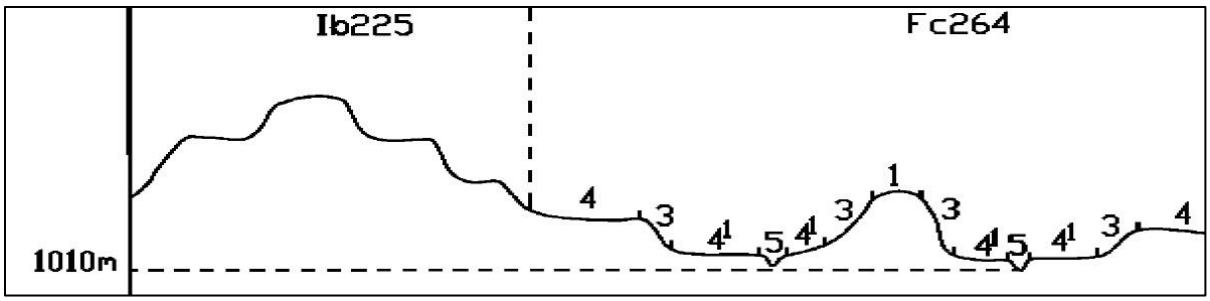


Figure 7-1 Land Types present within the assessment corridor boundaries

The soils expected to occur with the respective terrain units for the relevant land type is illustrated in Figure 7-2 to Figure 7-5 and is described in Table 7-1 to Table 7-4.



* No land type data exists for Fc 265 given the similarities to Fc 264

Figure 7-2 Illustration of land type Fc 265 and 264 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 7-1 Soils expected at the respective terrain units within the Fc 265 and 264 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (5%)		**3 (15%)**		**4 (70%)**		**5 (10%)**	
Bare Rock	50%	Bare Rock	49%	Oakleaf	50%	Oakleaf	75%
Mispah	35%	Mispah	35%	Mispah	20%	Mispah	10%
Oakleaf	10%	Oakleaf	10%	Bare Rock	18%	Bare Rock	10%
Glenrosa	5%	Glenrosa	5%	Glenrosa	5%	Dundee	5%
		Valsrivier	1%	Swartland	5%		
				Valsrivier	1%		
				Clovelly	1%		

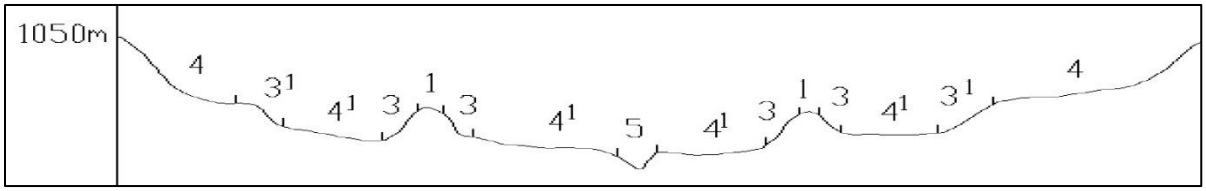


Figure 7-3 Illustration of land type Fc 266 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 7-2 Soils expected at the respective terrain units within the Fc 266 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (10%)		**3 (20%)**		**4 (60%)**		**5 (10%)**	
Bare Rock	50%	Bare Rock	59%	Oakleaf	80	Oakleaf	70%
Mispah	30%	Mispah	20%	Oakleaf	40%	Bare Rock	10%
Glenrosa	15%	Glenrosa	18%	Bare Rock	28%	Mispah	10%

Oakleaf	3%	Oakleaf	2%	Mispah	15%	Dundee	10%
Swartland	2%	Valsrivier	1%	Glenrosa	15%		
				Valsrivier	1%		
				Swartland	1%		

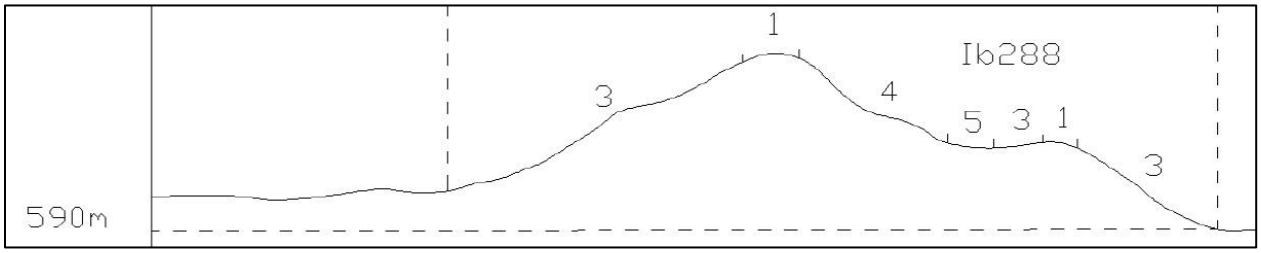


Figure 7-4 Illustration of land type IB 288 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 7-3 Soils expected at the respective terrain units within the IB 288 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units					
1 (15%)		**3 (75%)**		**5 (10%)**	
Bare Rock	60%	Bare Rock	70%	Bare Rock	40%
Glenrosa	30%	Glenrosa	25%	Hutton	25%
Hutton	10%	Hutton	5%	Streambeds	20%
				Shortlands	10%
				Glenrosa	5%

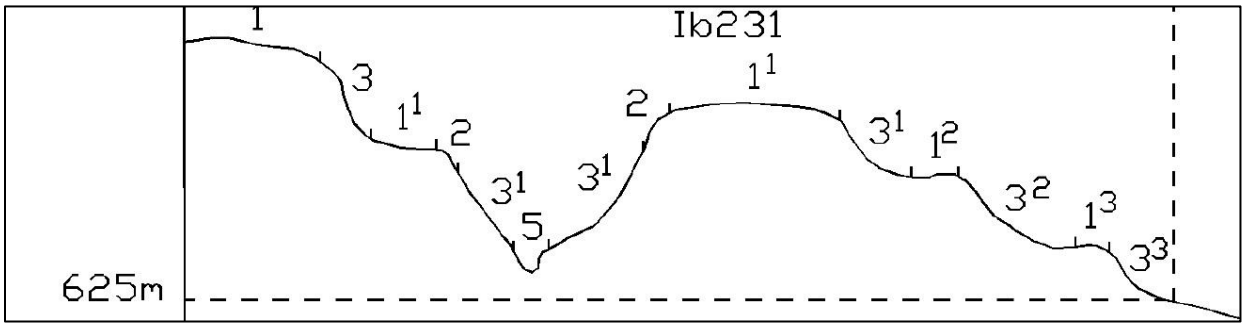


Figure 7-5 Illustration of land type IB 231 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 7-4 Soils expected at the respective terrain units within the IB 231 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units			
1 (15%)	**3 (70%)**	**4 (10%)**	**5 (5%)**

Bare Rock	90%	Bare Rock	80%	Bare Rock	60%	Oakleaf	60%
Mispah	5%	Mispah	10%	Mispah	18%	Bare Rock	30%
Glenrosa	5%	Glenrosa	6%	Glenrosa	18%	Swartland	10%
		Oakleaf	2%	Oakleaf	2%		
		Valsrivier	2%	Swartland	2%		

7.2 Terrain

The slope percentage of the project area/corridor has been calculated and is illustrated in Figure 7-6. The majority of the project area/corridor is characterised by a slope percentage between 0 and 10%, with some smaller patches within the project area characterised by a slope percentage up to 82%. This illustration indicates a non-uniform topography with alternating hills and steep cliffs surrounding flatter areas at high elevation. The Digital Elevation Model (DEM) of the project area/corridor (Figure 7-7) indicates an elevation of 1 151 to 1 334 Metres Above Sea Level (MASL).

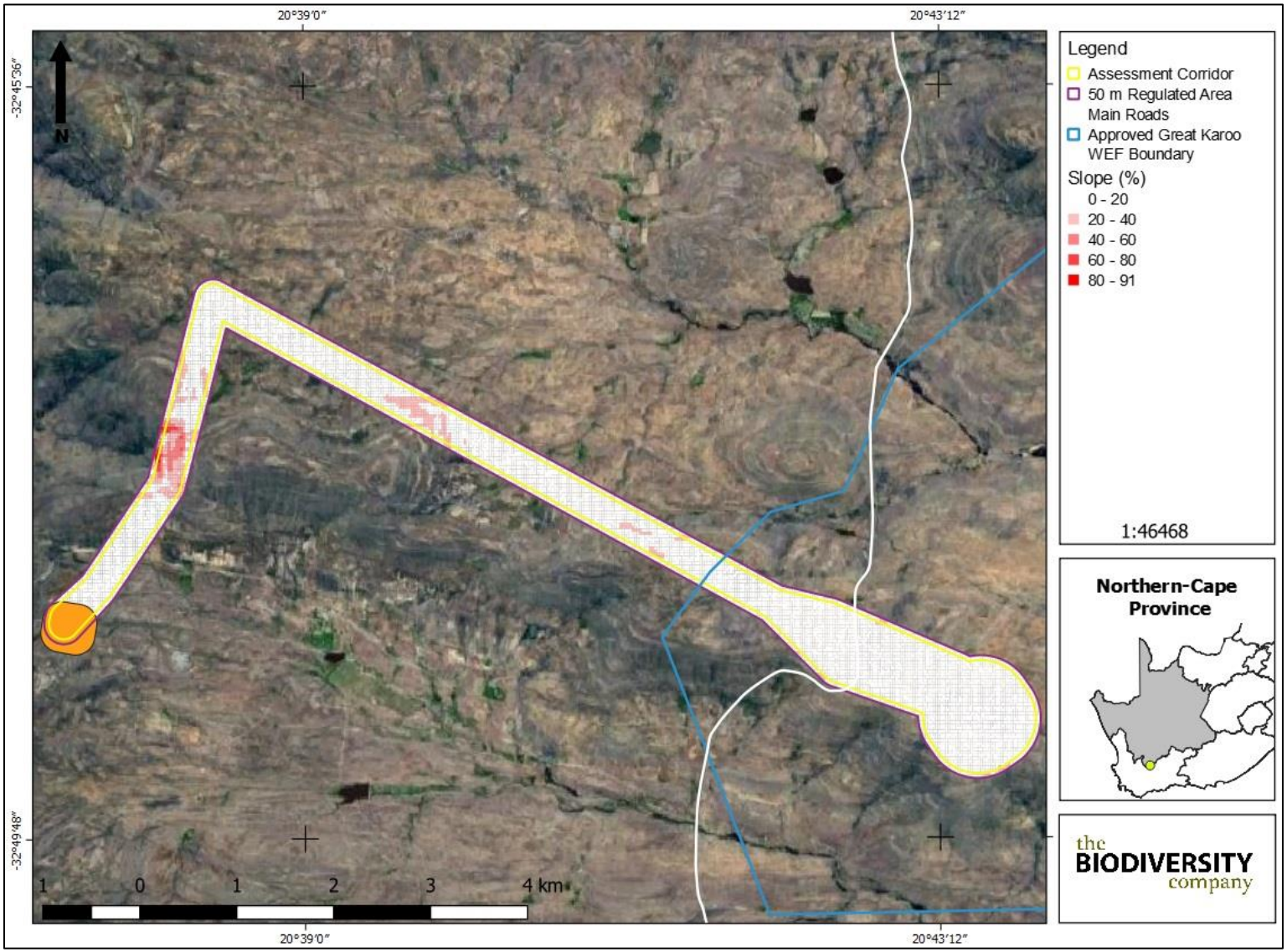


Figure 7-6 Slope percentage map for the assessment corridor

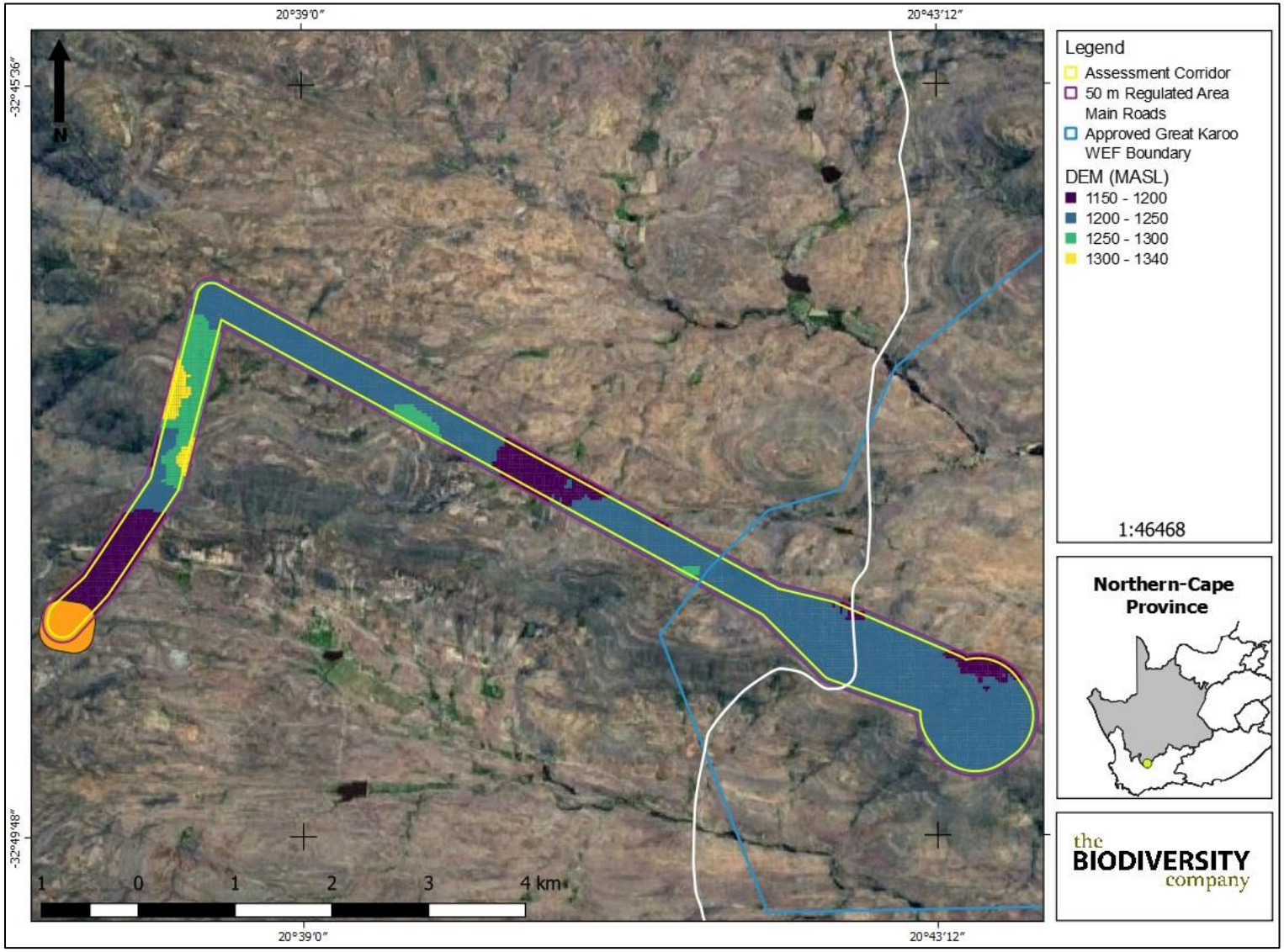


Figure 7-7 Digital Elevation Model of the assessment corridor (metres above sea level)

7.3 Current Land Use

Current land use predominantly includes grazing of small livestock (sheep). The assessment corridor is surrounded by mountainous areas which limits other land uses. Watercourses are located throughout the project area/corridor, and include wetland areas, dry drainage lines and non-perennial river systems.

8 Results and Discussion

8.1 Baseline Findings

The following soils forms were identified within the portion of the corridor focussed on during the site visit (also see Figure 8-1 and Figure 8-2);

- Magudu soil form (Orthic topsoil above a Red Structured Apedal horizon, which in turn is underlain by a Lithic horizon);
- Mispah soil form (Orthic topsoil on top of a Hard Rock layer);
- Glenrosa soil form (Orthic topsoil on top of a Lithic horizon);
- Bare Rock (Exposed rock);
- Bethesda (Orthic topsoil on top of a Neocutanic horizon, which in turn is underlain by a Hard rock layer);
- Prieska (Orthic topsoil on top of a Neocutanic horizon, which in turn is underlain by a Hard Carbonate horizon); and
- Tshiombo (Orthic topsoil on top of a Neocutanic horizon, which in turn is underlain by an Unconsolidated material with signs of wetness).

The land capability of the above mentioned soils range from a land capability 3 to a land capability 7 with the climate capability determined to be a climate capability level 8 given the low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The combination between the determined land capabilities and climate capabilities result in a land potential of “6” to “8”. These land potential levels are associated “Very Restricted Potential” and “Very Low Potential”.

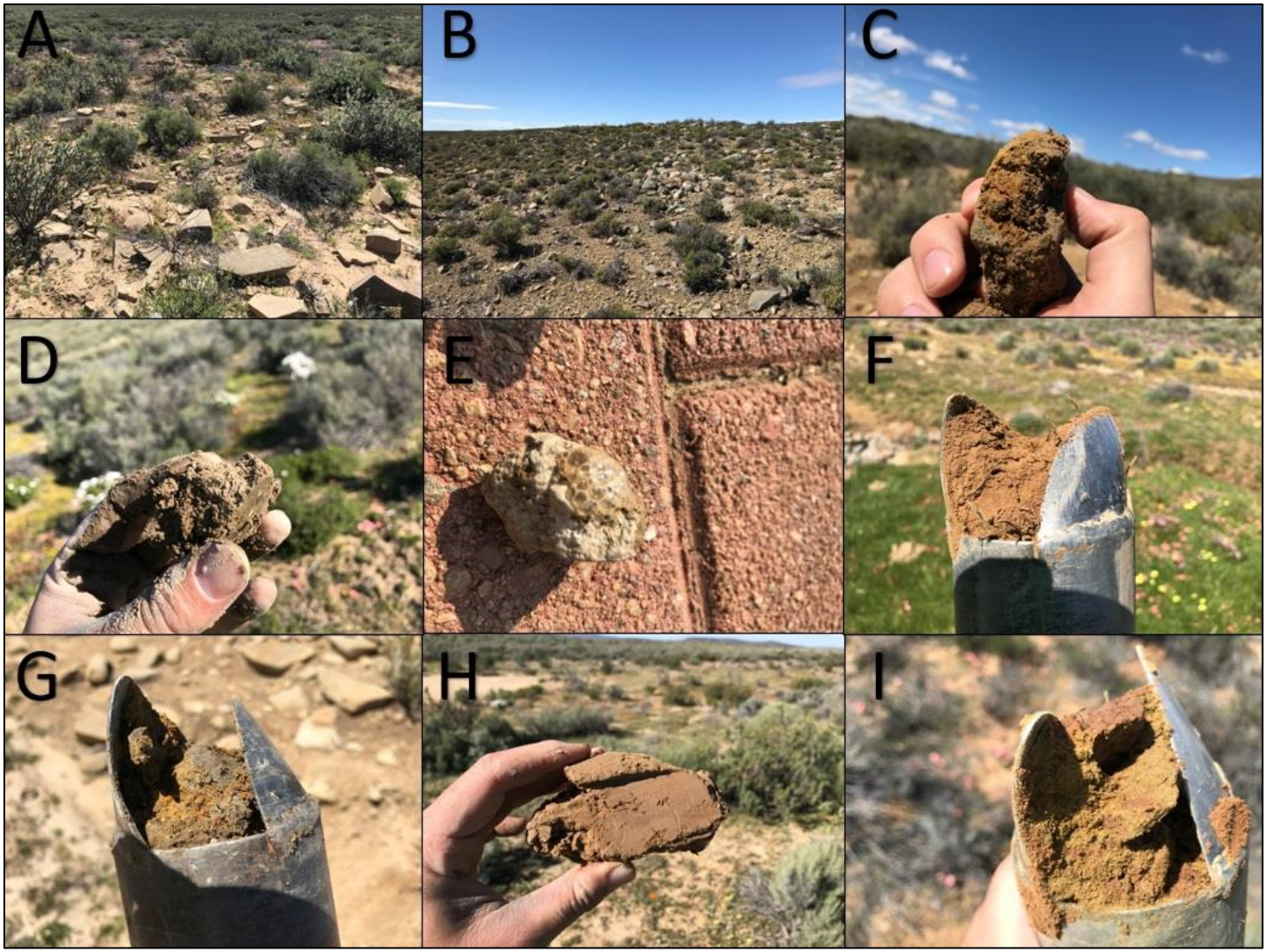


Figure 8-1 Soil horizons identified within the assessment corridor. A and B) Glenrosa and exposed rock. C and G) Unconsolidated material with signs of wetness. D) Hard Carbonate. E) Hard Carbonate reacting to HCl. F) Neocutanic horizon. H) Red Structured horizon. I) Transition between Neocutanic horizon and Hard Rock.

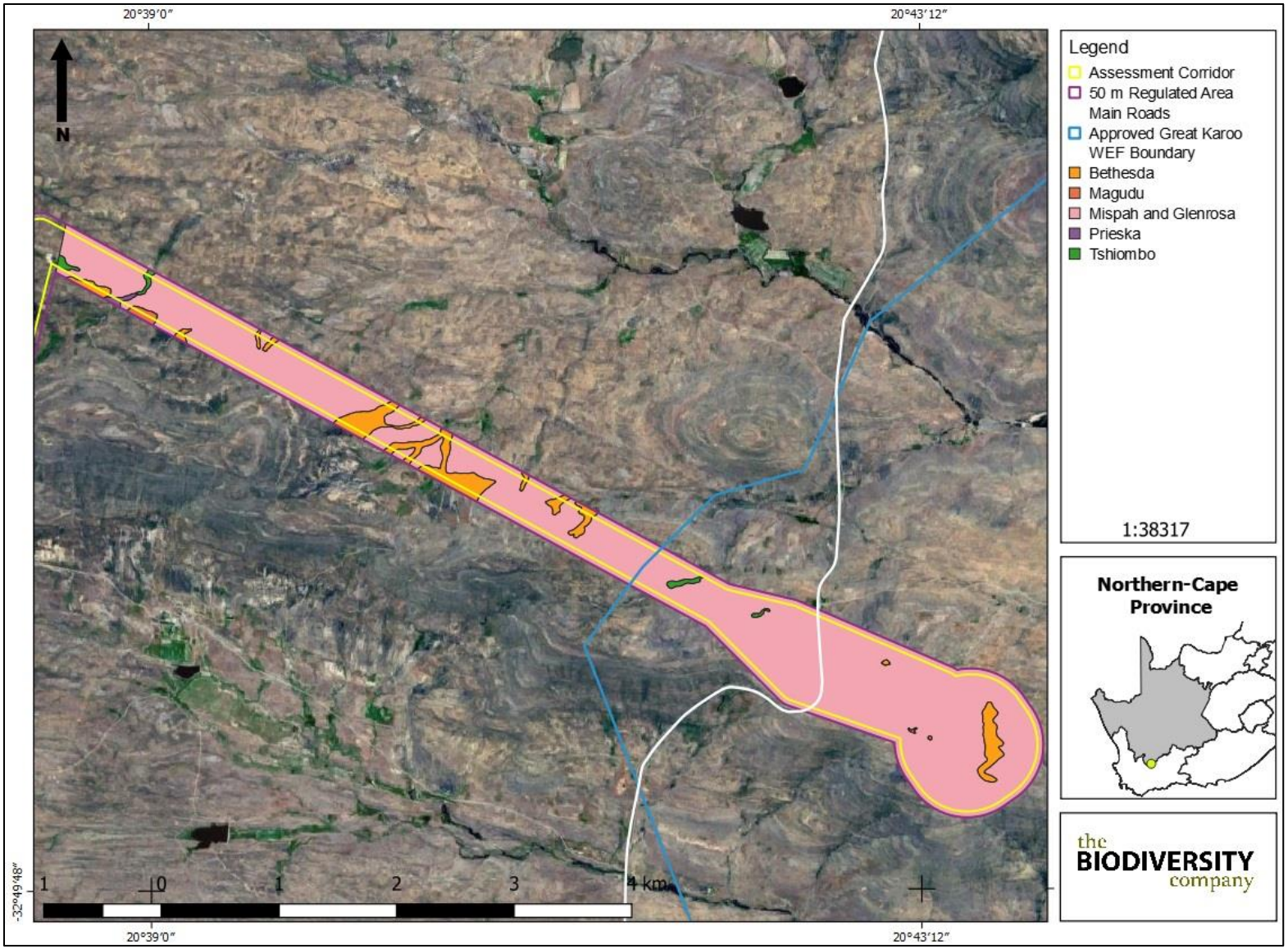


Figure 8-2 Delineated soil forms

8.2 Sensitivity Verification

The following land potential levels have been calculated;

- Land potential level 6 (this land potential level is characterised by regular or severe limitations due to soil, slope, temperatures or rainfall. This land potential level has been determined to be non-arable);
- Land potential level 7 (this land potential level is characterised by severe limitations due to soil, slope, temperatures or rainfall. This land potential level has been determined to be non-arable); and
- Land potential level 8 (this land potential level is characterised by very severe limitations due to soil, slope, temperatures or rainfall. This land potential level has been determined to be non-arable).

Fifteen land capabilities have been digitised by (DAFF, 2017) across South Africa, of which two are located within the proposed footprint area's assessment corridor, including;

- Land Capability 1 (Very Low Sensitivity); and
- Land Capability 6 (Low to Moderate Sensitivity).

The baseline findings and the sensitivities as per the Department of Agriculture, Forestry and Fisheries (DAFF, 2017) national raster file concur with one another. It therefore is the specialist's opinion that the land capability and land potential of the resources in the assessment corridor ranges from "Very Low" to "Low to Moderate" (see Figure 8-3), which conforms to the requirements of an agricultural compliance statement.

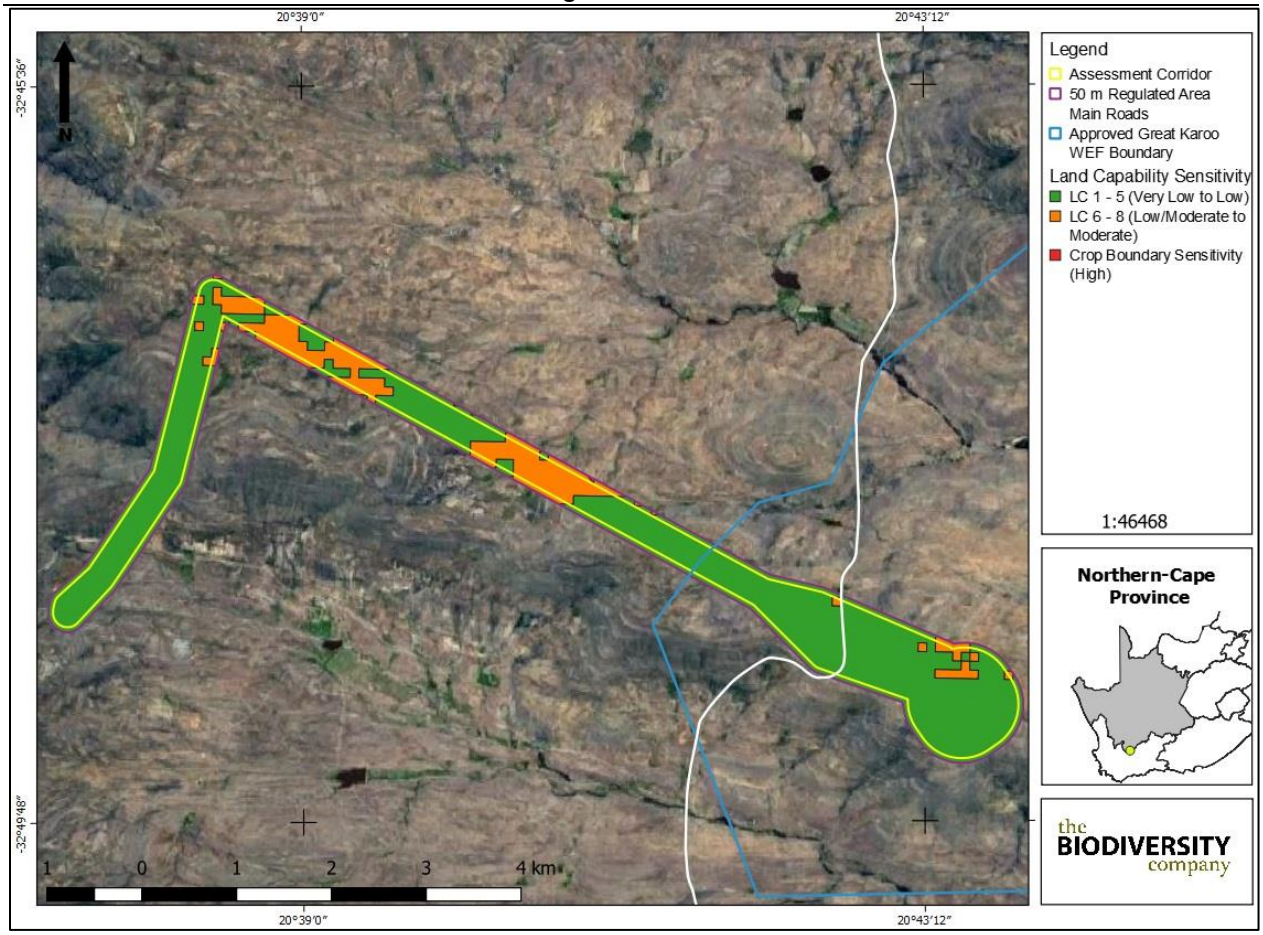


Figure 8-3 Land Capability Sensitivity (DAFF, 2017)

9 Recommendations

9.1 Mitigation

The following general mitigation measures have been prescribed. Even though the land potential and land capability in the area is of low sensitivity, the following measures will ensure the conservation of soil resources;

- In cases of erosion, erosion berms must be implemented to minimise any further erosion;
- Compacted areas are to be ripped to loosen the soil structure;
- Existing roads should be used as much as possible during construction;
- Temporarily cleared areas should be revegetated with indigenous species after the construction phase;
- All laydown yards must be constructed within the Glenrosa, Mispah or Bare Rock areas due to the fact that this soil form is characterised by a lower land capability and land potential than the other soil forms;
- A stormwater management plan must be compiled for the proposed switching station, focussing on stormwater and considering erosion that might be caused as a result thereof; and
- Prevent any spills from occurring. Machines must be parked within hard park areas or dedicated storage areas and must be checked daily for fluid leaks.

9.2 Acceptability of Impacts

It is the specialist's opinion that the assessment corridor is not associated with any arable soils, due to the type of soil, the slope of some of the areas as well as the climate, which in itself limits crop production significantly. The land capabilities associated with the assessment corridor are only suitable to grazing, which ties in with the current land use.

It is the specialist's opinion that the proposed development will have very little impact on the agricultural production ability of the land. Therefore, the proposed development of the powerline and the switching station may be favourably considered anywhere within the assessment corridor. The above-mentioned mitigation measures must be considered by the issuing authority for authorisation.

10 Conclusion

Five soils forms were identified within the assessment corridor, including the Bethesda, Tshiombo, Mispah, Glenrosa, Bare Rock, Magudu and Prieska soil forms. The land capability sensitivities (DAFF, 2017) indicates land capabilities with “Very Low” and “Low to Moderate” sensitivities, which correlates with the findings from the baseline studies.

It is the specialist’s opinion that the agricultural production of the area will be negligibly impacted upon by the proposed project. It is the specialist’s opinion that development can take place anywhere within the assessment corridor given the fact that no “High” sensitivity resources were identified.

10 References

Land Type Survey Staff. 1972 - 2006. Land Types of South Africa: Digital Map (1:250 000 Scale) and Soil Inventory Databases. Pretoria: ARC-Institute for Soil, Climate, and Water.

Mucina, L., & Rutherford, M. C. 2006. The Vegetation of South Africa, Lesotho, and Swaziland. Strelitzia 19. Pretoria: National Biodiversity Institute.

SASA, S. A. 1999. Identification & management of the SOILS of the South African sugar industry. Mount Edgecombe: South African Sugar Association Experiment Station.

Smith, B. 2006. The Farming Handbook. Netherlands & South Africa: University of KwaZulu-Natal Press & CTA.

Soil Classification Working Group. 1991. Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

Soil Classification Working Group. 2018. Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

TerraAfrica Consult cc. 2020. Agricultural Compliance Statement for the proposed Great Karoo Battery Energy Storage System

Appendix A- Specialist CV

Masters in Environmental Science and Hydropedology

Cell: +27 79 898 4056

Email: ivan@thebiodiversitycompany.com

Identity Number: 9401105251087

Date of birth: 10 January 1994

Profile Summary

Working experience throughout Southern Africa

Working experience in West-Africa

Specialist experience with mining, construction and agriculture.

Specialist expertise include hydropedology, pedology, land contamination, agricultural potential, land rehabilitation, rehabilitation management and wetlands resources.

Experience hydropedological modelling (HYDRUS model)

Areas of Interest

Mining, Oil & Gas, Renewable Energy & Bulk Services Infrastructure Development, Farming, Land contamination, Sustainability and Conservation.

Key Experience

- Environmental Impact Assessments (EIA)
- Environmental Management Programmes (EMP)
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Soil-and rock classification
- Level 1, 2 and 3 hydropedology assessments
- Agriculture potential assessments
- Land contamination assessments
- Modulation of surface- and subsurface flows (HYDRUS model)

Countries worked in

South Africa, Mozambique, Swaziland, Zimbabwe, Guinea

Nationality

South African

Languages

English – Proficient

Afrikaans – Proficient

Qualifications

- MSc (North-West University of Potchefstroom) – Hydropedology
- BSc Honours (North-West University of Potchefstroom) – Environmental geology-Pedology and rehabilitation
- BSc Environmental sciences
- Pr Sci Nat candidateship

SELECTED PROJECT EXPERIENCE

Project Name: Environmental impact assessment for the construction of Road DR08606 leading to Mlamli Hospital, Sterkspruit

Personal position / role on project: Wetland ecologist

Location: Sterkspruit, Eastern Cape Province, South Africa

Main project features: To conduct a wetland assessment, as a component of the environmental authorisation process and Water Use Licence Application (WULA) for the construction of Road DR08606 leading to Mlamli Hospital

Project Name: Biodiversity Baseline & Impact Assessment Report for the proposed Nondvo Dam Project

Personal position / role on project: Wetland ecologist

Location: Mbabane, Swaziland

Main project features: To conduct various assessments according to IFC standards in regard to delineation of wetlands and assessing ecosystem services.

Project Name: Agricultural Potential Assessment - Proposed Kalabasfontein Coal Mining Project Extension

Personal position / role on project: Project Manager and Soil Specialist.

Location: Bethal, Mpumalanga, South Africa

Main project features: To conduct a soil assessment to identify any sensitive resources that might be affected by the proposed mining activities and associated infrastructure as part of an environmental impact assessment.

Project Name: Soil assessment for the closure of the St Helena Shaft, Harmony

Personal position / role on project: Soil specialist

Location: Welkom, Free State, South Africa

Main project features: To conduct a thorough soil and fertility assessment to recommend relevant mitigation and rehabilitation measures to finalise closure at the relevant mine

Project Name: Wetland Functionality Assessment for the Environmental, Health and Socio-Economic Baseline Studies for Block 2 at Siguiri Gold Mine

Personal position / role on project: Wetland ecologist

Location: Siguiri, Guinea, West-Africa

Main project features: To conduct various assessments according to IUCN standards in regard to delineation of wetlands and assessing ecosystem services.

Project Name: Level 3 Hydropedological Assessment for the Sara Buffels Mining Project

Personal position / role on project: Hydropedologist

Location: Ermelo, Mpumalanga, South-Africa

Main project features: To conduct various assessments to determine the hillslope hydrology and to acquire information relevant to the vadose zone's hydraulic properties to quantify sub-surface flows by means of modelling.

Project Name: Level 3 Hydropedological Assessment for the Buffalo Coal Mining Project

Personal position / role on project: Hydropedologist

Location: Dundee, KwaZulu-Natal, South-Africa

Main project features: To conduct various assessments to determine the hillslope hydrology and to acquire information relevant to the vadose zone's hydraulic properties to quantify sub-surface flows by means of modelling

Project Name: Biodiversity Baseline & Impact Assessment for the proposed Tetereane 15MW Solar PV Plant

Personal position / role on project: Ecosystem Services Specialist

Location: Cuamba, Mozambique, Southern-Africa

Main project features: To conduct various assessments according to IUCN standards in regard to ecosystem services

Project Name: Land contamination assessment for the proposed Fleurhof Development

Personal position / role on project: Soil Specialist

Location: Fleurhof, South Africa

Main project features: To conduct assessments relevant to the determination of land contamination, including recommendations, mitigations and risk assessments.

OVERVIEW

An overview of the specialist technical expertise include the following:

- Ecological wetland assessment studies, including the integrity (health) and functioning of the wetland systems.
- Wetland offset strategy designs.
- Wetland rehabilitation plans.
- Monitoring plans for wetland systems.
- Soil classification and agricultural assessments.
- Stripping and stockpiling guidelines.
- Soil rehabilitation plans.
- Soil and stockpile monitoring plans.
- Hydropedological assessments.

TRAINING

Some of the more pertinent training undergone includes the following:

- Tools for a Wetland Assessment (Certificate of Competence) – Rhodes University 2018; and
- Workshop on digital soil mapping.

EMPLOYMENT EXPERIENCE

Internship at SRK consulting (January 2017-August 2017)

- **Field assistant** for SRK consulting during 2017 included the sampling of surface and groundwater as well as on site tests, the accumulation of various different data sets from field loggers, presenting and arranging the relevant data and ultimately using it for my own personal post-graduate studies.

Internship at The Biodiversity Company (August 2017-December 2017)

Employed as an intern (wetland and soil scientist) during the last few months of 2017. During this period, I was part of a variety of soil- and wetland projects, both as report writer and/or field assistant.

CURRENT EMPLOYMENT: The Biodiversity Company (January 2018 – Present)

- **Scientific report writing** to ensure that the relevant standards and requirements have been attained, namely local country legislation, as well as WB, EP and IFC requirements.

ACADEMIC QUALIFICATIONS

North-West University of Potchefstroom: MAGISTER SCIENTIAE (MSc) - Hydropedology:

Title: *Characterisation of vadose zone processes in a tailings facility*

North-West University of Potchefstroom (2016): BACCALAUREUS SCIENTIAE HONORIBUS (Hons) – Environmental Geology- Pedology and rehabilitation

North-West University of Potchefstroom (2015): BACCALAUREUS SCIENTIAE IN NATURAL AND ENVIRONMENTAL SCIENCES. Majors: Geology and Geography