Soil and Agricultural Assessment for the proposed Grid Connection & Associated Infrastructure for the Emoyeni Wind Energy Facilities

Western & Northern Cape, South Africa

August 2022

CLIENT

Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

Report Name	**Soil and Agricultural Assessment for the proposed Grid & Associated Infrastructure for the Emoyeni Wind Energy Facilities**
Submitted to	
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.
Report Writer and Fieldwork	**Maletsatsi Mohapi**
	Maletsatsi Mohapi is a Soil scientist in the field of Natural and Agricultural sciences. Maletsatsi is a soil and wetland specialist, with an experience in soil identification, soil classification, wetland delineation and wetland monitoring. Maletsatsi completed her MSc in Agriculture at the University of the Free State in 2021. Maletsatsi is also a member of the Soil Science Society of South Africa (SSSSA).
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 Contents

Tables

Figures

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	Reference
Specialist Details and CV	Appendix A
Locality of the proposed activity	Section 2
Sensitivity verification	Section 5.2
Acceptability of impacts towards agricultural production capability associated with proposed activities	Section 6
Declaration of specialist(s)	Page vi
Project components with 50 m regulated area superimposed to that of the agricultural sensitivities of the screening tool	Section 5.2
Confirmation from specialist that mitigation to avoid fragmentation has been considered	Section 6
Statement from specialist regarding the acceptability and approval of proposed activities	Section 6
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	N/A
Assumptions and uncertainties	Section 5.4

Declaration

I, Maletsatsi Mohapi 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.

Maletsatsi Mohapi

Soil Scientist

The Biodiversity Company

August 2022

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 71 and is punishable in terms of Section 24F of the Act.

Matthew Mamera

Soil Specialist

The Biodiversity Company

August 2022

Declaration

I, Andrew Husted 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.

Andrew Husted

Aquatic Specialist

The Biodiversity Company

August 2022

1 Introduction

The Biodiversity Company was commissioned by Nala Environmental (Pty) Ltd to conduct a soil and agricultural potential assessment for the grid connection infrastructure and associated infrastructure for the authorised Emoyeni Wind Energy Facilities.

Eskom Holding SOC Ltd is proposing the development of a 132kV powerline, three 132kV on-site substations, new access/service tracks and watercourse crossing points associated with the authorised Umsinde Emoyeni, Ishwati Emoyeni and Khangela Emoyeni Wind Energy Facilities.

A Basic Assessment (BAR) process will be undertaken for the project in support of the application for authorisation. The proposed project includes the following:

- The establishment of a 132kV collector substation (switching station) within the authorised Umsinde Emoyeni WEF site (adjacent to the WEF facility substation) with a footprint of approximately 100m X 80 m (~0.8ha) to be located within an assessment footprint that encompasses a 300 m radius.
- The establishment of a 132kV collector substation (switching station) within the authorised Khangela Emoyeni WEF site (adjacent to the WEF facility substation) with a footprint of approximately 100m X 80 m (~0.8ha) to be located within an assessment footprint that encompasses a 300 m radius.
- The establishment of a 132kV collector substation (switching station) within the authorised Ishwati Emoyeni WEF site (adjacent to the WEF facility substation) with a footprint of approximately 120 m X 100 m (~1.2 ha) with an assessment footprint that encompasses a 300 m radius.
- The establishment of a 132kV powerline within a 400 m wide corridor that will extend from the Khangela switching station to the Ishwati switching station (~36 km), and then onward for ~25 km to the Eskom Gamma Substation. In addition, a further length of 132kV powerline (within a 400 m wide corridor) will extend from the Umsinde switching station to the Khangela switching station for ~8 km OR it may connect directly into the Khangela-Ishwati powerline at the Khangela switching station. An extended powerline development corridor of approximately 1,91 km^2 wide has been assessed in the vicinity of the Gamma Substation, that will enable the 132kV powerline to connect to either the south face of the Gamma Substation yard or approach from the east. The 132kV Powerline from Umsinde to Khangela, and from Khangela to Ishwati and onward to Gamma Substation will be a single- or double-circuit powerline, with a single set of pylons structures with a maximum height of 35 m Access/service tracks (jeep track) up to 7 m wide and associated watercourse crossings will be associated with the powerline and will be located within the assessed powerline corridor.

- The establishment of a new access road approximately 14 km long from the existing public road from Richmond to the authorised Ishwati Emoyeni on-site substation site. The proposed new access road will be unsealed and up to 12 m wide during construction but will be reduced to a maximum of 6 m width during operation.

The following alternatives are proposed for the powerline access tracks:

	Preferred Alternative		Alternative 1		Alternative 2	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
Start (on-site substation at Umsinde Emoyeni WEF site)	31°51'13.38"S	24° 1'25.58"E	31°51'13.38"S	24° 1'25.58"E	31°51'13.38"S	24° 1'25.58"E
Point 2	31°50'14.37"S	24° 0'50.32"E	31°50'14.37"S	24° 0'50.32"E	31°50'14.37"S	24° 0'50.32"E
Point 3	31°48'43.59"S	23°57'55.92"E	31°48'43.59"S	23°57'55.92"E	31°48'43.59"S	23°57'55.92"E
Start (on-site substation at Khangela Emoyeni WEF site)	31°48'43.05"S	23°57'42.71"E	31°48'43.05"S	23°57'42.71"E	31°48'43.05"S	23°57'42.71"E
Point 4	31°50'14.63"S	23°55'28.86"E	31°50'14.63"S	23°55'28.86"E	31°50'14.63"S	23°55'28.86"E
Point 5	31°49'13.74"S	23°53'33.39"E	31°49'13.74"S	23°53'33.39"E	31°49'13.74"S	23°53'33.39"E
Point 6	31°49'7.26"S	23°52'39.52"E	31°49'7.26"S	23°52'39.52"E	31°49'7.26"S	23°52'39.52"E
Point 7	31°47'31.74"S	23°49'11.72"E	31°47'31.74"S	23°49'11.72"E	31°47'31.74"S	23°49'11.72"E
Point 8	31°45'32.28"S	23°45'29.58"E	31°45'32.28"S	23°45'29.58"E	31°45'32.28"S	23°45'29.58"E
Point 9	31°43'29.18"S	23°45'1.23"E	31°44'1.56"S	23°42'34.93"E	31°44'1.56"S	23°42'34.93"E
Point 10	31°42'48.88"S	23°40'11.59"E	31°43'6.86"S	23°42'18.16"E	31°42'48.88"S	23°40'11.59"E
Point X (only applicable to Alternative 1)			31°42'48.88"S	23°40'11.59"E		
Point 11 (Ishwati Collector Sub)	31°42'24.42"S	23°39'30.33"E	31°42'24.42"S	23°39'30.33"E	31°42'24.42"S	23°39'30.33"E
Point 12	31°42'34.31"S	23°38'58.91"E	31°42'34.31"S	23°38'58.91"E	31°42'34.31"S	23°38'58.91"E
Point 13	31°43'9.01"S	23°38'11.49"E	31°43'9.01"S	23°38'11.49"E	31°43'9.01"S	23°38'11.49"E
Point 14	31°43'54.78"S	23°35'20.23"E	31°43'54.78"S	23°35'20.23"E	31°43'54.78"S	23°35'20.23"E
Point 15	31°40'58.19"S	23°25'27.11"E	31°40'58.19"S	23°25'27.11"E	31°40'58.19"S	23°25'27.11"E

End (Extended 1,91km² development corridor to (Gamma Substation) Preferred Alternative from the east	31°40'46.22"S	23°24'46.55"E	31°40'46.22"S	23°24'46.55"E	31°40'46.22"S	23°24'46.55"E
End (Extended 1,91km²development corridor to Gamma Substation) Preferred Alternative from the south	31°40'56.04"S	23°24'40.11"E	31°40'56.04"S	23°24'40.11"E	31°40'56.04"S	23°24'40.11"E

Preferred Alternative = Red (From Umsinde on-site switching station to Khangela on-site switching station to the Ishwati onsite switching station to the Gamma Substation)

Alternative 1 = Red +Light Blue + Red (From Umsinde on-site switching station to Khangela on-site substation to the Ishwati onsite substation to the Gamma Substation)

Alternative 2 = Red +Light blue + Green + Red (From Umsinde on-site switching station to Khangela on-site substation to the Ishwati onsite substation to the Gamma Substation)

The approach adopted for the assessments 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 within the 50 m regulated 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 development.

This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making, as to the ecological viability of the proposed project.

2 Locality

The proposed grid connection infrastructure is located approximately 18.6 km south of the N1 road and approximately 20 km north-east of the R63 road. The proposed area is also found north of the Murraysburg town in the Western Cape Province (see Figure 2-1). The surrounding land use predominantly includes agriculture (grazing), game farms and mountainous areas.

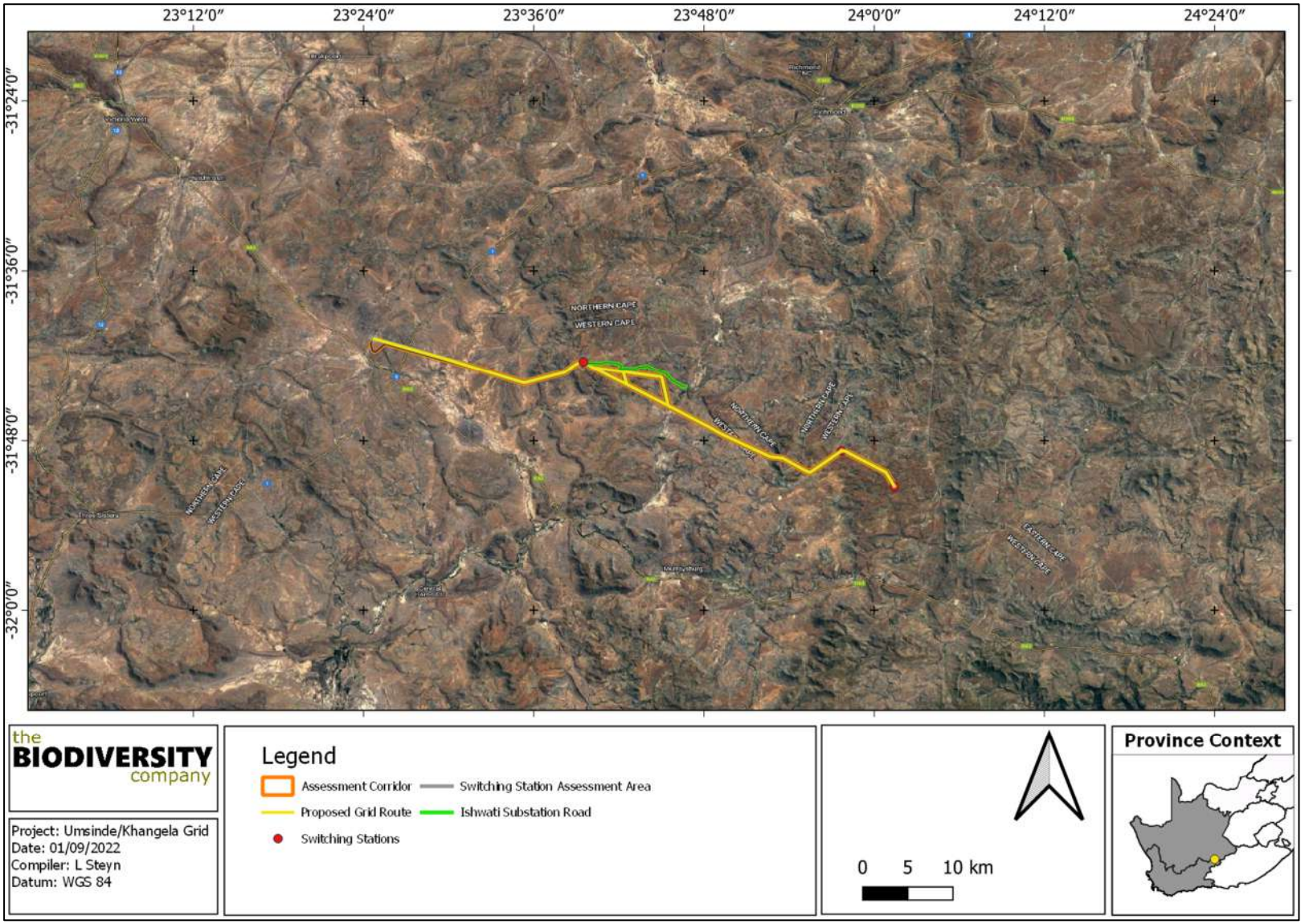


Figure 2-1 Locality map of the project area

3 Scope of work

According to the National Web based Environmental Screening Tool, the proposed development is located within a "Low" sensitivity land capability area. The protocols for minimum requirements (DEA, 2020)[1] 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 50 m regulated areas, it is the specialist's opinion that the soil forms and associated land capabilities concur with the sensitivities stated by the screening tool. Therefore, only an agricultural compliance statement will be compiled. This includes:

- The feasibility of the proposed activities;
- Confirmation about 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 Expertise of the specialists

4.1 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.

4.2 Maletsatsi Mohapi

Maletsatsi Mohapi is a Soil scientist in the field of Natural and Agricultural sciences. Maletsatsi is a soil and wetland specialist, with an experience in soil identification, soil classification, wetland delineation and wetland monitoring. Maletsatsi completed her MSc in Agriculture at the University of the Free State in 2021. Maletsatsi is also a member of the Soil Science Society of South Africa (SSSSA).

[1]A site identified by the screening tool as being of 'High" or "Very High" sensitivity for agricultural resources must submit a specialist assessment unless the impact on agricultural resources is from an electricity pylon (item 1.1.2).

4.3 Matthew Mamera

Matthew Mamera is Cand. Sci Nat registered (116356) in natural and agricultural sciences with a recognition in soil science. Matthew is a soil and hydropedology specialist with experience in soil pedology, hydropedology, water and sanitation management and land contamination and has field experience and numerous scientific publications in international peer reviewed journals. Matthew completed his Msc in soil science, hydropedology and water management at the University of Fort Hare, Alice. He is also a holder of a PhD in soil science, hydropedology, water and sanitation obtained at the University of the Free State, Bloemfontein. Matthew is also a member of the Soil Science Society of South Africa (SSSSA).

5 Methodology

5.1 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.

5.2 Field Survey

An assessment of the soils present within the project area was conducted during a field survey in August 2022. 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 1,5 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.

5.3 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 to 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 5-1 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 5-1 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 5-2. The final land potential results are then described in Table 5-3.

Table 5-2 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 5-3 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

5.4 Limitations

The following limitations are applicable:

- The information contained in this report is based on auger points taken and observations on site. There may be variations in terms of the delineation of the soil forms across the area;
- Access to selected areas as restricted, based on this information collated for sampled sites has been extrapolated for the larger project area; and
- The GPS used for delineations is accurate to within five meters. Therefore, the delineation plotted digitally may be offset by at least five meters to either side.

6 Project Area

6.1 Soils and Geology

According to the land type database (Land Type Survey Staff, 1972 - 2006) the assessment corridor to be focused on falls within the Fc 131, Fb 488, Ib 126, Ia 94 and Db 147 land types. The Fc and Fb land type mostly consisting of Mispah, Swartland and/Valsrivier soil forms with the possibility of other soils as well as rocky areas also occurring throughout. Lime is rare or absent within this land type in upland soils but generally present in low-lying areas. The Db 147 land type consists of miscellaneous land classes including rocky areas with Glenrosa, Mispah and Valsrivier soil forms. The Ia 94 and Ib 126 land type also consists of miscellaneous land classes including rocky areas with Mispah and Oakleaf soils forms according to the SA soil classification working group (1990). The terrain units and expected soils for the Fc 131 land type is illustrated in Figure 6-1 and Table 6-1; Fb 488 in Figure 6-2 and Table 6-2; Ib 126 in Figure 6-3 and Table 6-3; Ia 94 in Figure 6-4 and Table 6-4; and Db 147 in Figure 6-5 and Table 6-5 respectively.

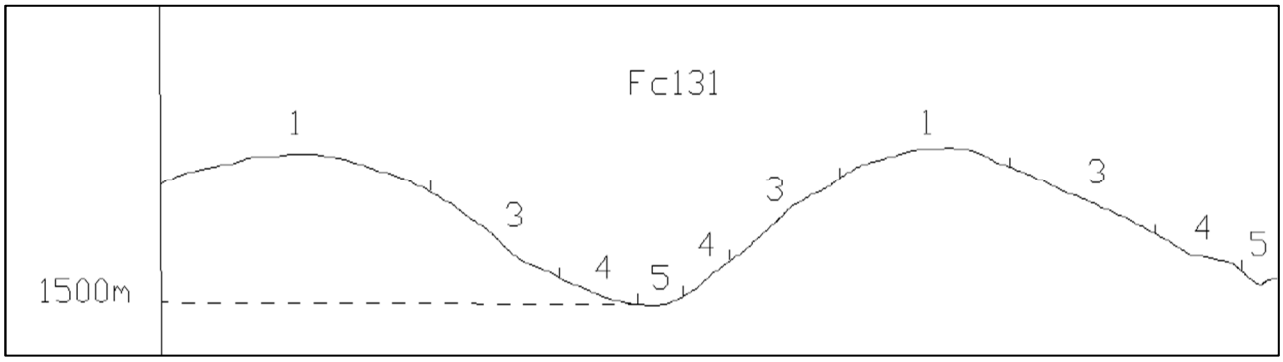


Figure 6-1 Illustration of land type Fc 131 terrain unit (Land Type Survey Staff, 1972 – 2006)

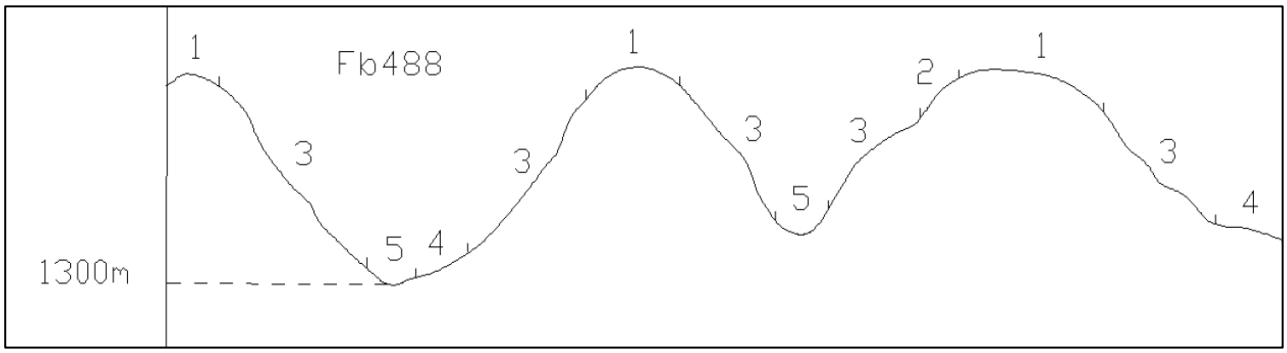


Figure 6-2 Illustration of land type Fb 488 terrain unit (Land Type Survey Staff, 1972-2006)

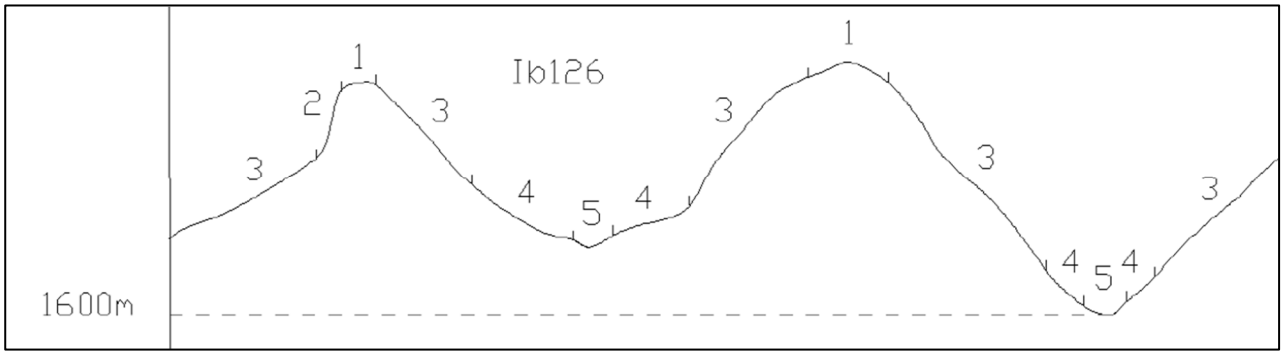


Figure 6-3 Illustration of land type Ib 126 terrain unit (Land Type Survey Staff, 1972 – 2006)

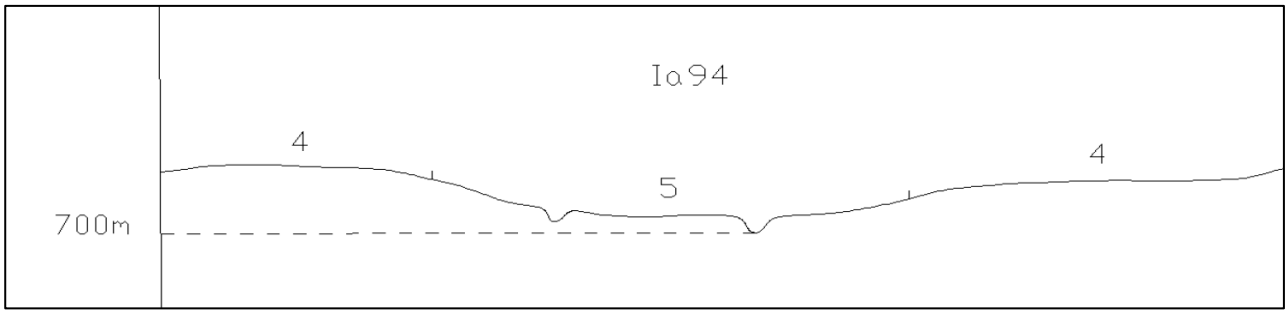


Figure 6-4 Illustration of land type Ia 94 terrain units (Land Type Survey Staff, 1972 – 2006)

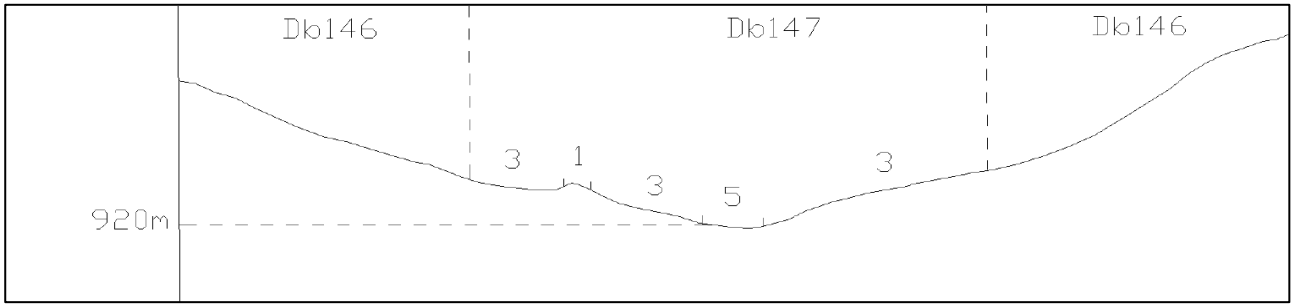


Figure 6-5 Illustration of land type Db 147 terrain units (Land Type Survey Staff, 1972 – 2006)

Table 6-1 Soils expected at the respective terrain units within the Fc 131 land type (Land Type Survey Staff, 1972 – 2006)

Terrain Units

1 (15%)		3 (40%)		4 (30%)		5 (15%)	
Mispah	50%	Mispah	45%	Mispah	25%	Valsirivier	35%
Bare Rock	25%	Bare rock	15%	Valsiriveir	20%	Oakleaf	25%
Hutton	10%	Hutton	15%	Oakleaf	20%	Mispah	20%
Clovelly	5%	Glenrosa	10%	Hutton	15%	Glenrosa	5%
Shortlands	5%	Swartland	5%	Swartland	10%	Dundee	5%
Glenrosa	5%	Clovelly	5%	Clovelly	5%	Estcourt	5%
		Shortlands	5%	Glenrosa	5%	Inhoek	5%

Table 6-2 Soils expected at the respective terrain units within the Fb 488 land type (Land Type Survey Staff, 1972 – 2006)

Terrain Units									
1 (18%)		2 (2%)		3 (60%)		4 (10%)		5 (10%)	
Bare Rock	40%	Bare Rock	100%	Mispah	35%	Mispah	30%	Oakleaf	60%
Mispah	40%			Swartland	20%	Swartland	20%	Bare Rock	15%
Hutton	10%			Hutton	20%	Oakleaf	20%	Mispah	15%
Glenrosa	10%			Bare Rock	15%	Bare Rock	10%	Swartland	10%
				Glenrosa	10%	Hutton	10%		
						Glenrosa	10%		

Table 6-3 Soils expected at the respective terrain units within the Ib 126 land type (Land Type Survey Staff, 1972 – 2006)

Terrain Units									
1 (20%)		2(5%)		3 (70%)		4 (2%)		5 (3%)	
Bare Rock	60%	Barerock	100%	Bare Rock	65%	Oakleaf	30%	Valsirivier	45%
Mispah	25%			Mispah	20%	Valsiriveir	15%	Oakleaf	40%
Glenrosa	5%			Valsiriveir	5%	Glenrosa	10%	Inhoek	5%
Swartland	5%			Glenrosa	5%	Swartland	10%	Estcourt	5%
Hutton	5%			Swartland	3%	Mispah	5%	Sterkspruit	5%
				Hutton	2%	Hutton	5%		
						Sterspruit	5%		

Table 6-4 Soils expected at the respective terrain units within the Ia 94 land type (Land Type Survey Staff, 1972 – 2006)

Terrain Units			
1 (60%)		**2(40%)**	
Oakleaf	75%	Oakleaf	80%
Swartland	10%	Valsrivier	10%
Glenrosa	8%	Dundee	7%
Bare Rock	5%	Bare Rock	3%
Mispah	2%		

Table 6-5 Soil expected at the respective terrain units within the Db 147 land type (Land Type Survey Staff, 1972 – 2006)

Terrain Units					
1 (3%)		**2(90%)**		**3 (7%)**	
Glenrosa	35%	Valsrivier	50%	Valsrivier	20%
Mispah	35%	Estcourt	15%	Estcourt	20%
Swartland	15%	Swartland	10%	Rensburg	20%
Westleigh	10%	Glenrosa	7%	Erosion	20%
Wasbank	5%	Mispah	7%	Stream beds	20%
		Westlegh	3%		
		Longlands	3%		
		Sterkspruit	2%		

6.2 Terrain

The slope percentage of the project area has been calculated and is illustrated in Figure 6-6. The majority of the regulated area is characterised by a slope percentage between 0 and 20%, with some smaller patches within the project area characterised by a slope percentage above 70%. This illustration indicates a non-uniform area with undulating slopes, mountainous areas and ridges. The Digital Elevation Model (DEM) of the project area indicates an elevation of 1 170 to 1 683 Metres Above Sea Level (MASL) presented in Figure 6-7.

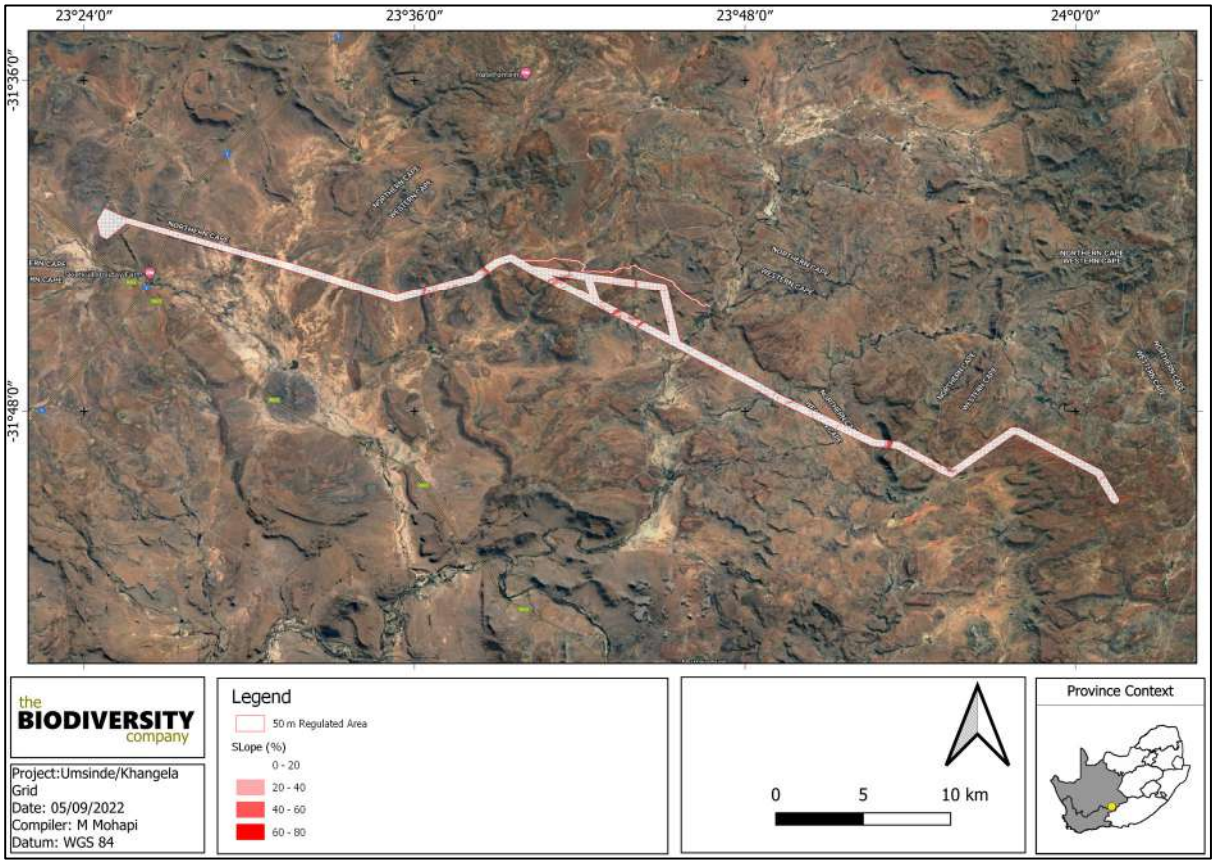


Figure 6-6 Slope percentage map for the project area

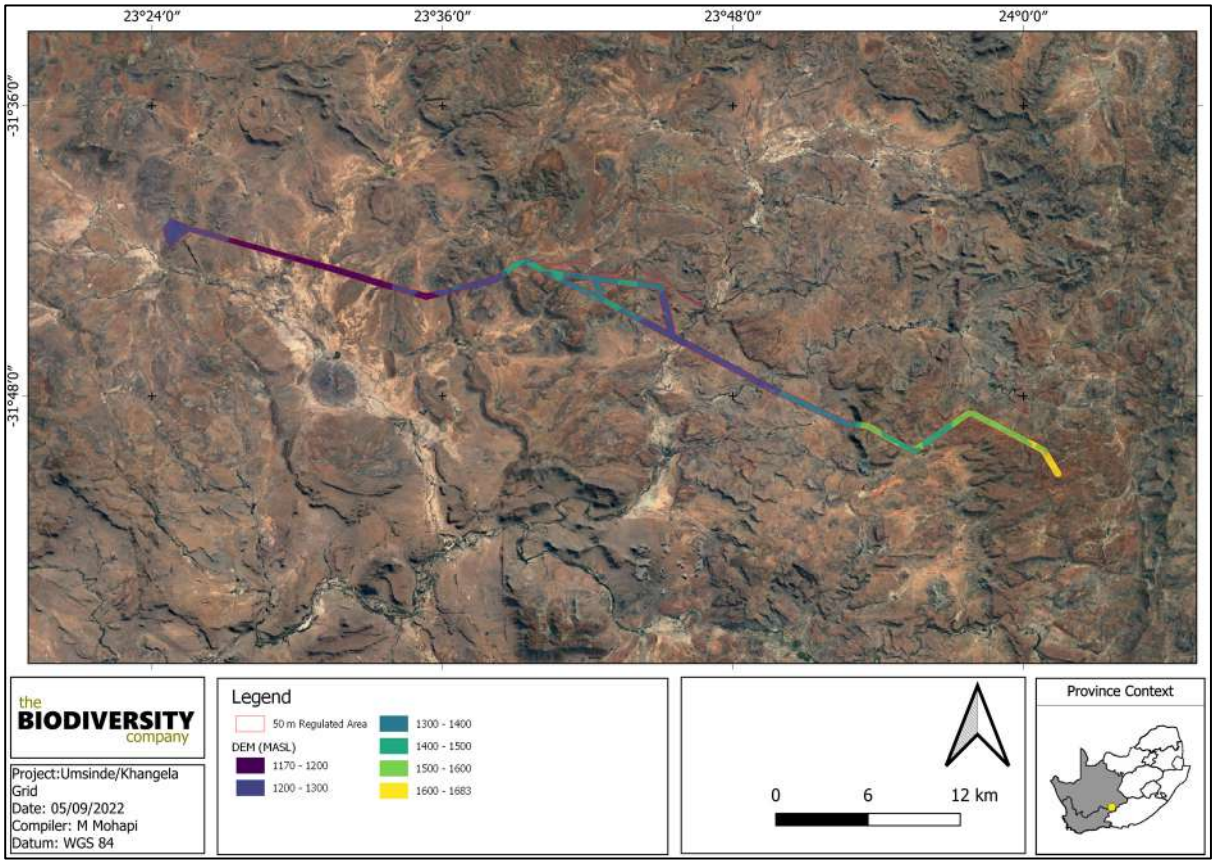


Figure 6-7 Elevation map for the project area

7 Results and Discussion

7.1 Baseline Findings

The most sensitive soil forms identified in the project area include Vaalbos, Carolina, Dundee, Oakleaf and Quaggafontein soil forms (see **Error! Reference source not found.**~~Figure 7-1~~). The Vaalbos soil form consist of an orthic topsoil on top of a red apedal subsoil, which is underlain by a hard rock. Carolina soil form consist of an orthic topsoil on top of a yellow-brown apedal subsoil, which is underlain by a hard rock. The Dundee soil form consists of an orthic topsoil on top of thick alluvial subsoil horizon. The Oakleaf soil form consists of an orthic topsoil on top of a deep neocutanic horizon. The Quaggafontein soil form consists of an orthic topsoil on top of a neocutanic horizon underlain with an alluvial subsurface diagnostic horizon.

The above-mentioned soils have been determined to have a land capability of class “IV” as well as 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 results in a land potential of “L6”, which is defined as having very restricted potential. *Regular and/or severe limitations due to soil, slope, temperatures or rainfall. Non-arable*. The sensitivity of this land potential is characterised by a “*Low Sensitivity*”.

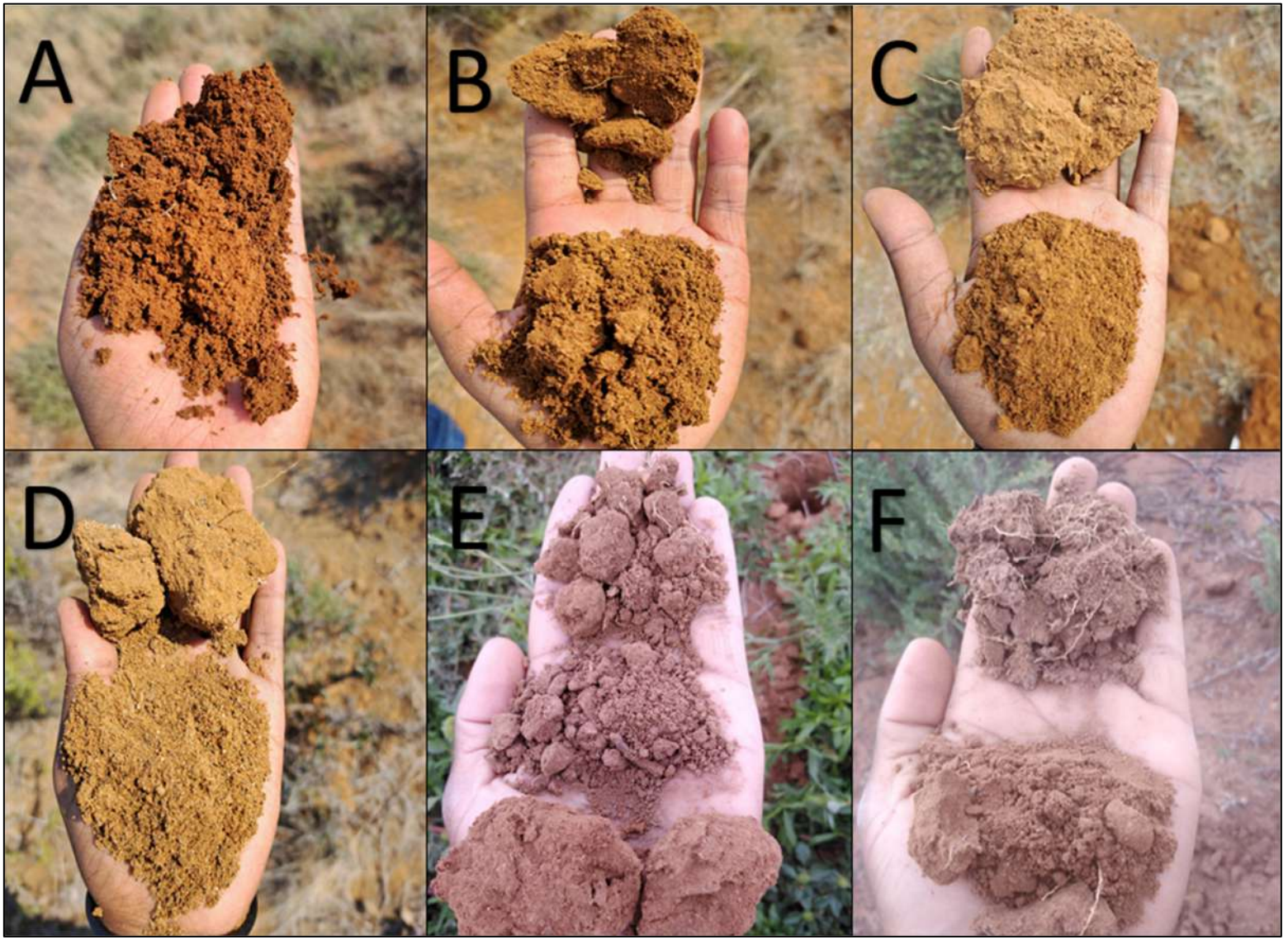


Figure 7-1 Sensitive soil forms; A & B) Vaalbos, C) Carolina, D) Dundee, E) Oakleaf, and F) Quaggafontein soil forms

7.2 Sensitivity Verification

The following land potential level has been determined;

- Land potential level 6 (this land potential level is defined as having very restricted potential. *Regular and/or severe limitations due to soil, slope, temperatures or rainfall. Non-arable*. The sensitivity of this land potential is characterised by a "*Low Sensitivity*").

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

- Land Capability 1 to 5 (Very low to Low); and
- Land Capability 6 to 8 (Low to Moderate).

The baseline findings and the sensitivities of the project area as per the Department of Agriculture, Forestry and Fisheries (DAFF, 2017) national raster file concur with one another (see Figure 7-2). It therefore is the specialist's opinion that the land capability and land potential of the resources in the regulated area is characterised by "Low" to "Moderate" sensitivities, which conforms to the requirements of an agricultural compliance statement only. The DEA screening tool, (2022) shows that some of the available crop fields within the assessment area are categorised as high sensitivity (see Figure 7-3). Hence, it is recommended that the crop fields be regarded as no-go areas for substations, pylons and service tracks (unless agreed otherwise with the landowners). The powerline may however span these areas without any effects on the crop fields.

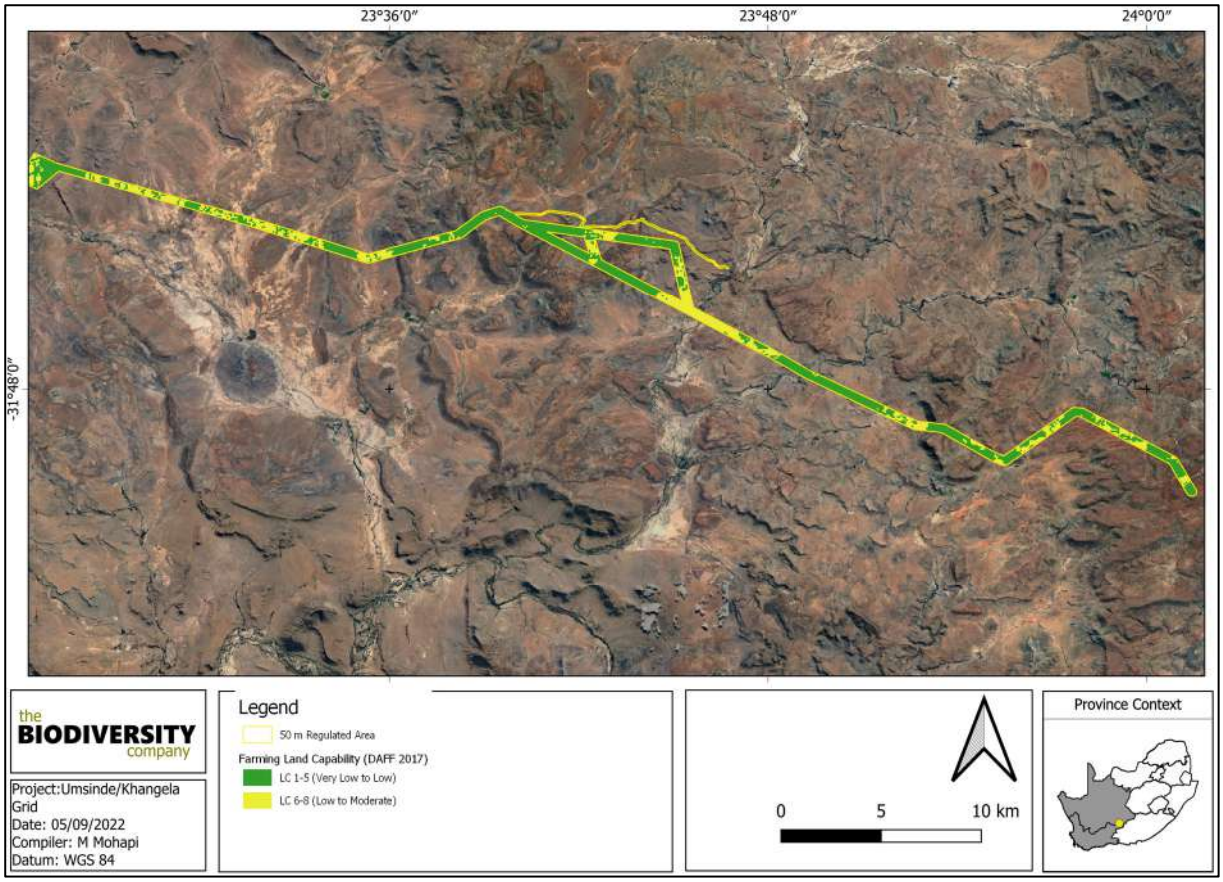


Figure 7-2 Land Capability Sensitivity map (DAFF, 2017)

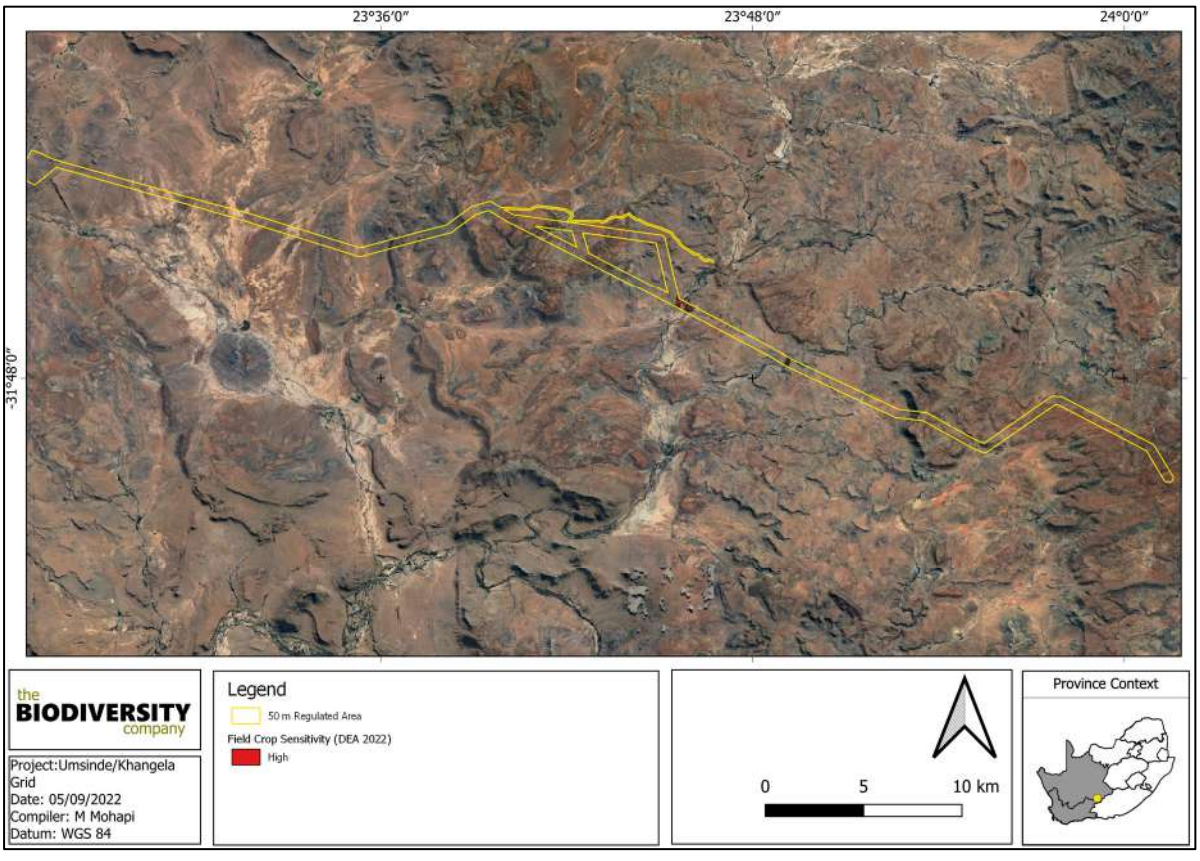


Figure 7-3 Field Crop Boundary Sensitivity map (DEA, 2022)

8 Conclusion and Impact Statement

The most sensitive soil forms identified within the assessment area are the Vaalbos, Carolina, Dundee, Oakleaf and Quaggafontein soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with “Low” and “Moderate” sensitivities, which correlates with the findings from the baseline findings.

The assessment area is not associated with any arable soils, due to the type of soil as well as the climate, which in itself limits crop production significantly. The harsh climatic conditions are associated with low annual rainfall and high evapotranspiration potential demands of the area. The land capabilities associated with the regulated area are only suitable for grazing and wildlife farming, which corresponds with the current land use.

It is the specialist’s opinion that the proposed grid connection and associated infrastructure will have no impacts on the agricultural production ability of the land. The assessment area does not consist of high clay content soils, it is mainly dominated by very shallow soils with restrictive hard rock layers. Therefore, there will not be any results of segregation of any high production agricultural land. However, some of the field crop boundaries were identified as “high sensitivity” within the 400m grid corridor, and these areas should be treated as no-go areas for substations, pylons and access/service tracks (unless agreed otherwise with the landowner). The powerline may however span these crop fields The assessed corridors including the 400 m development corridor and the 1.91 km^2 extended corridor, 300m substation assessment areas and access road will not have any impact on the agricultural potential of the land. Therefore, the proposed development may be favourably considered.

8.1 Mitigation

Earthworks will expose and mobilise earth materials which could result in compaction and/or erosion during construction. Further to this, machinery, vehicles and equipment on site, use of chemicals and concrete mixes can also result in soil resource contamination through leaks, spillages or breakages. Prescribed mitigation measures during the operational phase for the switching substations and spans will be easily managed by best “housekeeping” and soil erosion management practices. The effective management of storm drains can also reduce soil losses and soil disturbance and should only occur where necessarily required.

9 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.

SOIL AND AGRICULTURAL POTENTIAL: SITE SENSITIVITY VERIFICATION

CONTENTS

1. INTRODUCTION

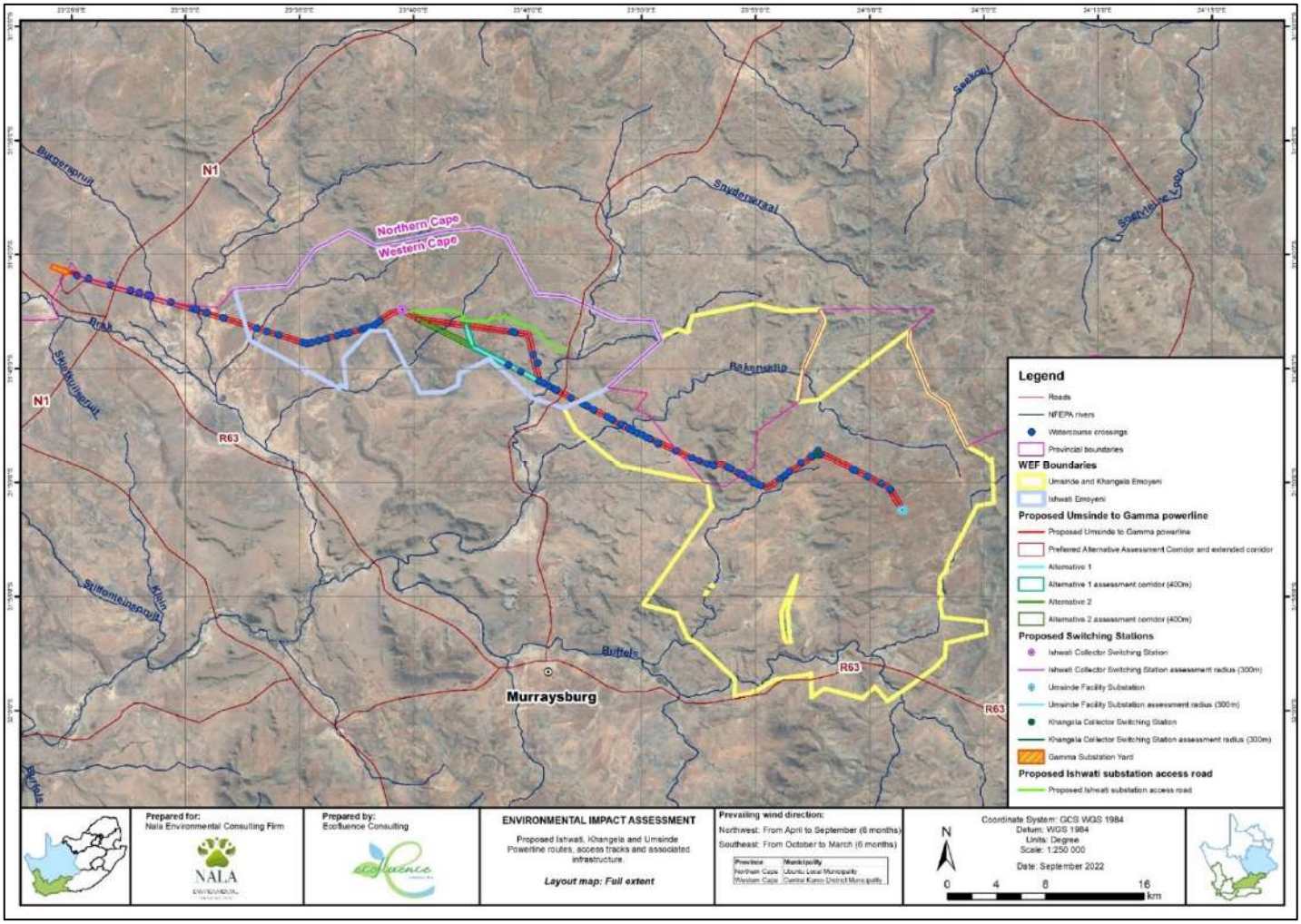
The applicant, Eskom Holdings SOC Limited is proposing the establishment of the 132kV grid connection infrastructure (overhead powerline and x3 on-site switching stations), associated access tracks & watercourse crossings associated with the authorised Emoyeni Wind Energy Facilities located in the Beaufort West & Ubuntu Local Municipalities, Northern and Western Cape Provinces.

The following Environmental Authorisations for various grid connection infrastructure and wind energy facilities related to the Emoyeni Wind Energy Facilities and their authorised grid connection infrastructure were previously obtained:

Umsinde Emoyeni Wind Energy Facility	DFFE Ref: 14/12/16/3/3/2/686 on 06 September 2018
132kV Grid connection Infrastructure associated with the Umsinde Emoyeni WEF	DFFE Ref: 14/12/16/3/3/2/684 on 06 September 2018
Khangela Emoyeni Wind Energy Facility	DFFE REF:. 14/12/16/3/3/2/687 on the 06 September 2018
132kV Grid connection Infrastructure associated with the Khangela Emoyeni WEF	DFFE REF:. 14/12/16/3/3/2/685 on 06 September 2018
Ishwati Emoyeni Wind Energy Facility	DFFE Ref: 12/12/20/2351 on 2 July 2015
Transmission grid connection infrastructure (Eskom Gamma Main Transmission Substation)	DFFE Ref: 14/12/16/3/3/2/410 on 02 July 2015

Distribution grid connection infrastructure (Eskom distribution grid connection infrastructure consisting of 132kV power lines and on-site switching station located within the authorised Ishwati Emoyeni Wind Energy Facility)	DFFE Ref: 14/12/16/3/3/2/411 on 02 July 2015

Following receipt of the relevant Environmental Authorisations for the grid connection infrastructure for the Umsinde and Khangela Emoyeni Wind Energy Facilities (DFFE Ref:14/12/16/3/3/2/684 and DFFE Ref:.14/12/16/3/3/2/685) , it was noted that several listed activities that were relevant to the grid infrastructure had not been considered , therefore new a Basic Assessment process



will be undertaken that will now consider all the applicable listed activities as per the EIA Regulations. In addition, due to alterations in the wind farm layouts, and based on further technical analysis and liaison with Eskom's technical and grid access units it was determined that the previously authorised powerline routings intended to evacuate electricity generated from these authorised wind energy facilities to the National Grid via the Gamma Substation are no longer suitable/ optimal and will need to be revised to cater for final wind farm layouts, and Eskom's connection requirements. A new Basic Assessment will therefore be undertaken to assess the revised (re-optimised) grid connection layout as well all applicable listed activities, including the listed activities omitted from the original BA process. The proposed 400m wide development corridor that has been identified for the development of the grid connection infrastructure required to evacuate power generated from the authorised Emoyeni WEFs, is informed by the most feasible grid connection point into the national grid from a technical, economic, and environmental perspective.

Figure 1. Proposed Layout map for the proposed development corridor and associated infrastructure related to the Emoyeni Wind Energy Facilities

Since the Umsinde Emoyeni and Khangela Emoyeni Wind Energy Facilities have been selected as preferred bidder projects by private offtakers and based on further technical analysis and liaison with Eskom's technical and grid access units it was determined that the previously authorised powerline routings intended to evacuate electricity generated from these authorised wind energy facilities to the National Grid via the Gamma Substation are no longer suitable/ optimal and will need to be revised to cater for final wind farm layouts, and Eskom's connection requirements. Therefore, new grid connection infrastructure is proposed that is in line with Eskom's technical and feasibility requirements. The following Infrastructure has been assessed:

- The establishment of a 132kV collector substation (switching station) within the authorised Umsinde Emoyeni WEF site (adjacent to the WEF facility substation) with a footprint of approximately 100m X 80m (~0.8ha) to be located within an assessment footprint that encompasses a 300m radius.
- The establishment of a 132kV collector substation (switching station) within the authorised Khangela Emoyeni WEF site (adjacent to the WEF facility substation) with a footprint of approximately 100m X 80m (~0.8ha) to be located within an assessment footprint that encompasses a 300m radius.

- The establishment of a 132kV collector substation (switching station) within the authorised Ishwati Emoyeni WEF site (adjacent to the WEF facility substation) with a footprint of approximately 120m X 100m (~1.2 ha) with an assessment footprint that encompasses a 300m radius.

- The establishment of a 132kV powerline within a 400m wide corridor that will extend from the Khangela switching station to the Ishwati switching station (~36km), and then onward for ~25km to the Eskom Gamma Substation. In addition, a further length of 132kV powerline (within a 400m wide corridor) will extend from the Umsinde switching station to the Khangela switching station for ~8km OR it may connect directly into the Khangela-Ishwati powerline at the Khangela switching station. An extended powerline development corridor of approximately 1.91 km^2 has been assessed in the vicinity of the Gamma Substation, that will enable the 132kV powerline to connect to either the south face of the Gamma Substation yard or approach from the east, depending on the available connection point at the time of connection. The 132kV Powerline from Umsinde to Khangela, and from Khangela to Ishwati and onward to Gamma Substation will be a single- or double-circuit overhead powerline, with a single set of pylons structures with a maximum height of 35m Access/service tracks (jeep track) up to 7m wide and associated watercourse crossings will be associated with the powerline, and will be located within the assessed powerline corridor.

- The establishment of a new access road approximately 14km long from the existing public road from Richmond to the Ishwati switching station site. The proposed new access road will be unsealed and up to 12m wide during construction , but will be reduced to a maximum of 6 m width during operation. The access road will largely follow an existing farm road (to be upgraded), but will also entail development of a new length of road.

The proposed grid infrastructure along with the access roads and water crossings are located within the authorised Umsinde, Khangela and Ishwati Wind Energy Facilities northeast of the town of Murraysburg. The authorised Umsinde Emoyeni WEF (DFFE REF: 14/12/16/3/3/2/686), Khangela Emoyeni Wind Energy Facility (DEA REF: 14/12/16/3/3/2/687) and the Ishwati Emoyeni Wind Energy Facility (DFFE REF: DFFE Ref: 12/12/20/2351) sites are located within the Beaufort West Renewable Energy Development Zone (REDZ) and the majority of the new proposed grid connection infrastructure falls within the REDZ and the Central Corridor of the Strategic Transmission Corridors.

Table 1.1: Location of proposed new development corridor housing the 132kV grid connection infrastructure, access tracks and watercourse crossings:

Province	Northern and Western Cape Province

Local Municipality	Beaufort West and Ubuntu Local Municipality
District Municipality	Central Karoo and Pixley ka Seme District Municipality
Nearest Town	Murraysburg
Ward No.	Ward 1 (BWLM), Ward 3 (ULM)
Details of properties affected	• Portion 1 of farm Klein Driefontein No. 152 • Remainder of Farm De Hoop No. 30; • Portion 2 of Farm De Hoop No. 30 • Remainder of Farm Swavel Kranse No. 28 • Portion 2 of Farm Swavel Kranse No. 28 • Portion 4 (portion of portion 1) of Farm Driefontein 26 • Portion 6 of Farm Klipplaat No. 109 Portion 4 (portion of portion 2) of Farm Klipplaat No. 109 • Portion 1 of the Farm Klipplaat No. 109 • Remainder Klipplaat No. 109 • Portion 1 of the Farm Uitvlugtfontein No. 265 • The Farm Riet Poort No. 9 • Remainder of Farm Driefontein No. 8 • Portion 3 of Farm Badfontein No. 10 (powerline alternative 1 route) • Remainder of Farm Leeuwenfontein No. 6 • Portion 2 of Farm Leeuwenfontein No. 6 • Portion 4 (a portion of portion 1) of Farm Allemansfontein No.7 • Portion 2 (a portion of portion 1) of Farm Allemansfontein No.7 • The Farm Klein Los Kop No.5 • Remainder of the Farm Schietkuil No.3

Table 1.2. The centre line co-ordinates of the 400m wide development corridor* are presented below for the proposed corridor alternatives:

	Preferred Alternative		**Alternative 1**		**Alternative 2**	
	Latitude	**Longitude**	**Latitude**		**Longitude**	
Start (on-site substation at Umsinde Emoyeni WEF site)	31°51'13.38"S	24° 1'25.58"E	31°51'13.38"S	24° 1'25.58"E	31°51'13.38"S	24° 1'25.58"E
Point 2	31°50'14.37"S	24° 0'50.32"E	31°50'14.37"S	24° 0'50.32"E	31°50'14.37"S	24° 0'50.32"E
Point 3	31°48'43.59"S	23°57'55.92"E	31°48'43.59"S	23°57'55.92"E	31°48'43.59"S	23°57'55.92"E
Start (on-site substation at	31°48'43.05"S	23°57'42.71"E	31°48'43.05"S	23°57'42.71"E	31°48'43.05"S	23°57'42.71"E

Khangela Emoyeni WEF site)						
Point 4	31°50'14.63"S	23°55'28.86"E	31°50'14.63"S	23°55'28.86"E	31°50'14.63"S	23°55'28.86"E
Point 5	31°49'13.74"S	23°53'33.39"E	31°49'13.74"S	23°53'33.39"E	31°49'13.74"S	23°53'33.39"E
Point 6	31°49'7.26"S	23°52'39.52"E	31°49'7.26"S	23°52'39.52"E	31°49'7.26"S	23°52'39.52"E
Point 7	31°47'31.74"S	23°49'11.72"E	31°47'31.74"S	23°49'11.72"E	31°47'31.74"S	23°49'11.72"E
Point 8	31°45'32.28"S	23°45'29.58"E	31°45'32.28"S	23°45'29.58"E	31°45'32.28"S	23°45'29.58"E
Point 9	31°43'29.18"S	23°45'1.23"E	31°44'1.56"S	23°42'34.93"E	31°44'1.56"S	23°42'34.93"E
Point 10	31°42'48.88"S	23°40'11.59"E	31°43'6.86"S	23°42'18.16"E	31°42'48.88"S	23°40'11.59"E
			31°42'48.88"S	23°40'11.59"E		
Point 11 (Ishwati Collector Sub)	31°42'24.42"S	23°39'30.33"E	31°42'24.42"S	23°39'30.33"E	31°42'24.42"S	23°39'30.33"E
Point 12	31°42'34.31"S	23°38'58.91"E	31°42'34.31"S	23°38'58.91"E	31°42'34.31"S	23°38'58.91"E
Point 13	31°43'9.01"S	23°38'11.49"E	31°43'9.01"S	23°38'11.49"E	31°43'9.01"S	23°38'11.49"E
Point 14	31°43'54.78"S	23°35'20.23"E	31°43'54.78"S	23°35'20.23"E	31°43'54.78"S	23°35'20.23"E
Point 15	31°40'58.19"S	23°25'27.11"E	31°40'58.19"S	23°25'27.11"E	31°40'58.19"S	23°25'27.11"E
End (Extended 1.91 km^2 development corridor to (Gamma Substation) Preferred Alternative from the east	31°40'46.22"S	23°24'46.55"E	31°40'46.22"S	23°24'46.55"E	31°40'46.22"S	23°24'46.55"E
End (Extended 1.91 km^2 development corridor to Gamma Substation) Preferred Alternative from the south	31°40'56.04"S	23°24'40.11"E	31°40'56.04"S	23°24'40.11"E	31°40'56.04"S	23°24'40.11"E

Table 1.3. Water Crossing Points along the 132kV Powerline within a 400m-wide corridor and gravel access track approximately 7m wide from the Umsinde Emoyeni switching station and extended 1.91 km^2 corridor to the Gamma Substation (Preferred Alternative):

Gamma Substation to Ishwati Switching Station					
Watercourse Crossing	GPS Coordinates		Watercourse Crossing	GPS Coordinates	
	Latitude	Longitude		Latitude	Longitude
1	31º 40.895'S	23º 25.233'E	16	31º 43.839'S	23º 35.129'E
2	31º 41.036'S	23º 25.743'E	17	31º 43.889'S	23º 35.303'E
3	31º 41.303'S	23º 26.688'E	18	31º 43.853'S	23º 35.487'E
4	31º 41.551'S	23º 27.579'E	19	31º 43.738'S	23º 35.826'E
5	31º 41.647'S	23º 27.969'E	20	31º 43.660'S	23º 36.141'E
6	31º 41.776'S	23º 28.327'E	21	31º 43.518'S	23º 36.634'E
7	31º 41.815'S	23º 28.474'E	22	31º 43.458'S	23º 36.905'E
8	31º 42.067'S	23º 29.346'E	23	31º 43.453'S	23º 36.987'E
9	31º 42.354'S	23º 30.316'E	24	31º 43.389'S	23º 37.208'E
10	31º 42.405'S	23º 30.479'E	25	31º 43.261'S	23º 37.699'E
11	31º 42.538'S	23º 30.925'E	26	31º 43.238'S	23º 37.813'E
12	31º 42.772'S	23º 31.654'E	27	31º 43.229'S	23º 37.905'E
13	31º 43.233'S	23º 33.111'E	28	31º 43.178'S	23º 38.061'E
14	31º 43.362'S	23º 33.570'E	29	31º 43.082'S	23º 38.300'E
15	31º 43.536'S	23º 34.080'E	30	31º 42.930'S	23º 38.518'E

Ishwati Switching Station to Khangela Switching Station					
Watercourse Crossing	GPS Coordinates		Watercourse Crossing	GPS Coordinates	
	Latitude	Longitude		Latitude	Longitude
31	31º 42.866'S	23º 40.290'E	58	31º 47.823'S	23º 49.804'E
32	31º 43.284'S	23º 41.134'E	59	31º 47.901'S	23º 49.951'E
33	31º 43.688'S	23º 41.937'E	60	31º 48.006'S	23º 50.198'E
34	31º 42.898'S	23º 41.616'E	61	31º 48.066'S	23º 50.364'E
35	31º 43.027'S	23º 42.364'E	62	31º 48.259'S	23º 50.708'E
36	31º 44.009'S	23º 42.534'E	63	31º 48.621'S	23º 51.486'E
37	31º 43.178'S	23º 43.374'E	64	31º 48.904'S	23º 52.183'E
38	31º 43.261'S	23º 44.255'E	65	31º 49.041'S	23º 52.498'E
39	31º 43.293'S	23º 44.328'E	66	31º 49.190'S	23º 52.867'E
40	31º 44.504'S	23º 43.539'E	67	31º 49.215'S	23º 53.392'E
41	31º 44.270'S	23º 45.237'E	68	31º 49.404'S	23º 53.891'E
42	31º 44.826'S	23º 44.149'E	69	31º 49.442'S	23º 53.813'E
43	31º 45.124'S	23º 44.700'E	70	31º 49.598'S	23º 54.228'E
44	31º 44.812'S	23º 45.526'E	71	31º 49.640'S	23º 54.290'E
45	31º 45.537'S	23º 45.494'E	72	31º 49.691'S	23º 54.376'E
46	31º 45.845'S	23º 46.109'E	73	31º 49.860'S	23º 54.672'E
47	31º 45.739'S	23º 45.958'E	74	31º 50.021'S	23º 54.889'E
48	31º 45.629'S	23º 45.691'E	75	31º 50.088'S	23º 55.079'E
49	31º 46.235'S	23º 46.853'E	76	31º 50.152'S	23º 55.217'E
50	31º 46.547'S	23º 47.440'E	77	31º 49.854'S	23º 56.055'E
51	31º 46.717'S	23º 47.775'E	78	31º 49.748'S	23º 56.220'E

52	31º 46.785'S	23º 47.899'E	**79**	31º 49.677'S	23º 56.303'E
53	31º 47.088'S	23º 48.482'E	**80**	31º 49.532'S	23º 56.461'E
54	31º 47.290'S	23º 48.698'E	**81**	31º 49.124'S	23º 56.975'E
55	31º 47.414'S	23º 48.959'E	**82**	31º 48.830'S	23º 57.425'E
56	31º 47.492'S	23º 49.051'E	**83**	31º 48.558'S	23º 57.715'E
57	31º 47.708'S	23º 49.547'E	**84**	31º 48.759'S	23º 57.831'E

Khangela Switching Station to Umsinde Switching Station		
Watercourse Crossing	**GPS Coordinates**	
	Latitude	**Longitude**
83	31º 48.558'S	23º 57.715'E
84	31º 48.759'S	23º 57.831'E
85	31º 48.886'S	23º 58.233'E
86	31º 49.101'S	23º 58.643'E
87	31º 49.438'S	23º 59.251'E
88	31º 49.489'S	23º 59.362'E
89	31º 49.750'S	23º 59.910'E
90	31º 50.062'S	24º 00.493'E
91	31º 50.317'S	24º 00.890'E

Table 1.4. Proposed New Access Road Co-ordinates to the authorised Ishwati Substation site:

	Latitude	**Longitude**
Start (off the existing unnamed gravel road)	31º 44.203'S	23º 46.714'E
Middle	31º 42.906'S	23º 42.942'E
End (Authorised Ishwati Substation site)	31º 42.407'S	23º 39.506'E

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations [4 December 2014, Government Notice (GN) R982, R983, R984 and R985, as amended], various aspects of the proposed developments may have an impact on the environment and are considered to be listed activities. These activities require authorisation from the National Competent Authority (CA), namely the Department of Forestry, Fisheries, and the Environment (DFFE), prior to the commencement thereof. Further to this as per GN R. 2313 : ***Adoptions of the standard for the development and expansion of powerlines and substation with identified geographical areas and the exclusion of this infrastructure from the requirements to obtain Environmental Authorisation*** , the Standard was adopted in terms of section 24(10)(a) of the Act for the purpose of excluding the activities contemplated in paragraph 5.1 and 5.2 of the Schedule from the requirement to obtain environmental authorisation prior to commencement. In terms of the procedural requirement set out in the standard, screening tool reports have been undertaken for the grid corridor and associated infrastructure and site sensitivity verifications have been undertaken by the relevant specialists in accordance with the sensitivity themes. As per 6.1. of the GNR .2313, "Where any part of the infrastructure occurs on an area for which the environmental sensitivity for any environmental theme is identified as being very high or high by the national web based environmental screening tool and confirmed to be such through the application of the

procedures set out in the Standard", the site sensitivity verifications have been performed as per the procedural requirements set out.

In accordance with GN 320 and GN 1150 (20 March 2020)[1] of the NEMA EIA Regulations of 2014 (as amended), prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool). Maletsatsi Mohapi, Matthew Mamera and Andrew Husted as soil pedology specialists, has been commissioned to verify the sensitivity of the project sites under these specialist protocols.

The scope of this report is for one (1) application, namely the 132KV grid connection infrastructure, associated access tracks & water course crossings associated with the authorised Emoyeni wind energy facilities, near Murraysburg, Beaufort West and Ubuntu Local Municipalities and Central Karoo and Pixely ka Seme District Municipalities, Western Cape, and Northern Cape Provinces.

2. SITE SENSITIVITY VERIFICATION METHODOLOGY

The following information sources were consulted to compile this report:

- 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:

  As part of the desktop assessment, baseline soil information is obtained using published South African Land Type Data. Land type data for the site is 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 is calculated by means of the NASA Shuttle Radar Topography Mission Global 1 arc second digital elevation data by means of QGIS and SAGA software.

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

  The Vegetation of South Africa, Lesotho and Swaziland book is used to identify the vegetation type found under natural conditions for the area in question. It is also used to determine its climate capability, which is calculated by dividing the Mean Annual Precipitation (MAP) with Mean Annual Potential Evapotranspiration (MAPE).

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

  The Farming Handbook is used to determine the land capability and ultimately the land potential of the area in question. Land capability is solely determined by means of the National Land Capability Evaluation Raster Data Layer. Thereafter, results from climate capability and land capability are used to determine the land potential of the area (Table 2.1). Land capability and agricultural potential are briefly determined by a combination of soil, terrain, and climate features. At the same time an indication is given about the permanent limitations associated with the different land use classes (Table

[1] GN 320 (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

2.2). Land capability is divided into eight classes, and these may be divided into three capability groups (Table 2.3). The risk of use increases from class I to class VIII (Smith, 2006).

Table 2.1: 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 2.2: 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

Table 2.3: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					

- Soil Classification Working Group. 1991. Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development; and Soil Classification Working Group. 2018. Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development:
  The Soil Classification book is used to identify and classify the different soil horizons within the profile to the soil family level. Soil colour, texture and clay percentage are main attributes used to differentiate the diagnostic horizons. The landscape features such as existing open trenches are also helpful in determining soil types and depth.

- DEA Screening Tool, 2022:
  The DEA Screening tool is used to obtain the information regarding the land capability sensitivity and field crop boundary sensitivity of the assessment area. Fifteen land capabilities were digitized across South Africa, including;
  - Land Capability 1 to 5 (Very low to Low);
  - Land Capability 6 to 8 (Low to Moderate), and
  - Land Capability 9 to 15 (Moderate to High).

  A land capability characterized by "Low" to "moderate" sensitivities, conform to the requirements of an agricultural compliance statement only, while a land capability characterized by "High" sensitivities conforms to the requirements of a full Environmental Impact Assessment (EIA).

3. OUTCOME OF SITE SENSITIVITY VERIFICATION

The land capability and land potential of the resources in the assessment area are characterised by "Low" to "Moderate" sensitivities (see Figure 3.1), which conforms to the requirements of an agricultural compliance statement only. The DEA screening tool (2022) shows that some of the available crop fields within the assessment area are categorised as high sensitivity (see Figure 3.2). Hence, it is recommended that the crop fields be regarded as no-go areas for substations, pylons, and service tracks (unless agreed otherwise with the landowners). The powerline may however span these areas without any effects on the crop fields.

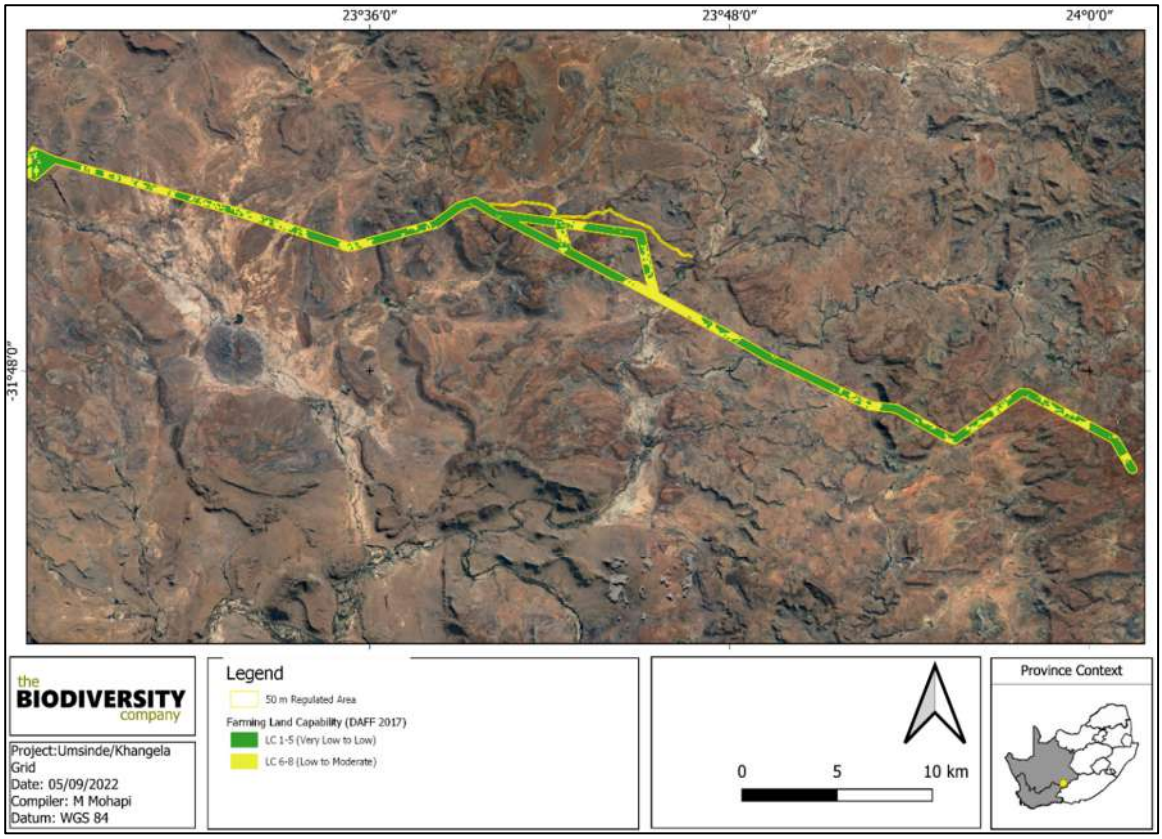


Figure 3.1: Land Capability Sensitivity map (DEA, 2022)

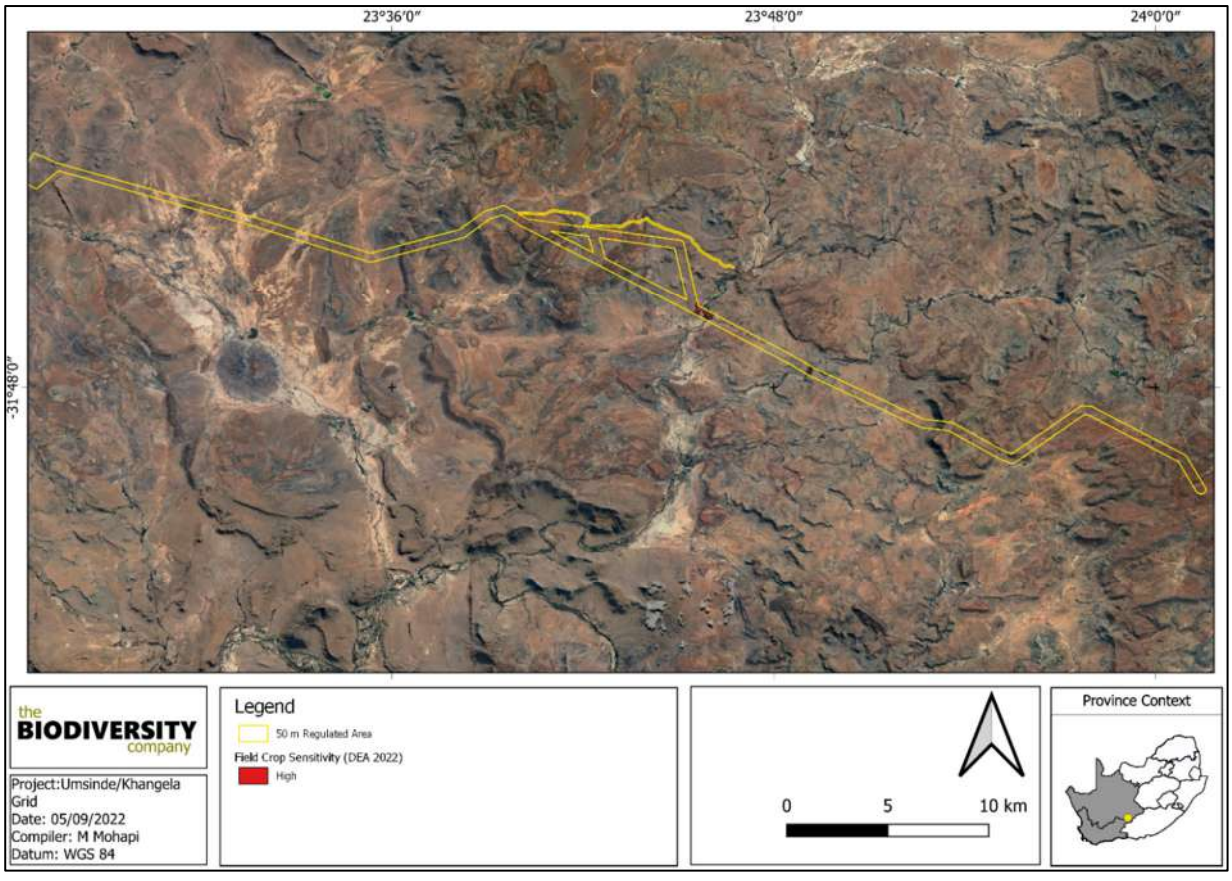


Figure 3.2: Field Crop Boundary Sensitivity map (DEA, 2022)

4. CONCLUSION

The assessment area was classified as a Low to Moderate land capability sensitivity area with no impacts on the agricultural production ability of the land. The assessment area also consists of small patches of high crop boundary sensitivity areas within the 400 m grid corridor and these areas should be treated as no-go areas for substations, pylons, and access/service tracks (unless agreed otherwise with the landowner). The powerline may however span these crop fields, therefore the assessed corridors including the 400 m development corridor and the 1.91 km2 extended corridor, 300m substation assessment areas and access road will not have any impact on the agricultural potential of the land.

This classification is thus confirmed to be accurate as far as the impact of the proposed powerline, substation and associated infrastructure is concerned, based on actual conditions recorded on the ground during the site visit of March 2022, April 2022, and August 2022.