Soil and Agricultural Assessment Report for the proposed Xhariep Export Programme (XEP) Agricultural Development and Associated Infrastructure

Xhariep District Municipality, Free State

June 2022

CLIENT

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Report Name	**Soil and Agricultural Assessment Report for the proposed Xhariep Export Programme (XEP) Agricultural Development and Associated Infrastructure**
Reference	**Xhariep Export Programme (XEP) Agricultural Development and Associated Infrastructure**
Submitted to	savannah environmental
Report Writer	**Matthew Mamera**  Matthew Mamera is a Cand. Sci Nat registered (116356) in natural and agricultural sciences recognized 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 peer reviewed scientific publications in international journals. Matthew completed his M.Sc. 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).
Report Writer / 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.
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.

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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 Pedologist

The Biodiversity Company

June 2022

1 Introduction

The Biodiversity Company was appointed by Savannah Environmental (Pty) Ltd (Savannah) to undertake a soil and agricultural potential assessment for the proposed Xhariep Export Programme Agricultural development and associated infrastructure project in the Letsemeng Local Municipality of the Xhariep District Municipality, Free State Province.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the published Government Notices (GN) 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" (Reporting Criteria). The National Web based Environmental Screening Tool (NWBEST) has characterised the agricultural theme sensitivity of the project area as predominantly "Low" to "Medium" with a "Very High" sensitivity given to the pivot areas within the project footprint (Figure 1-1). Based on this, a compliance statement has been compiled for the project.

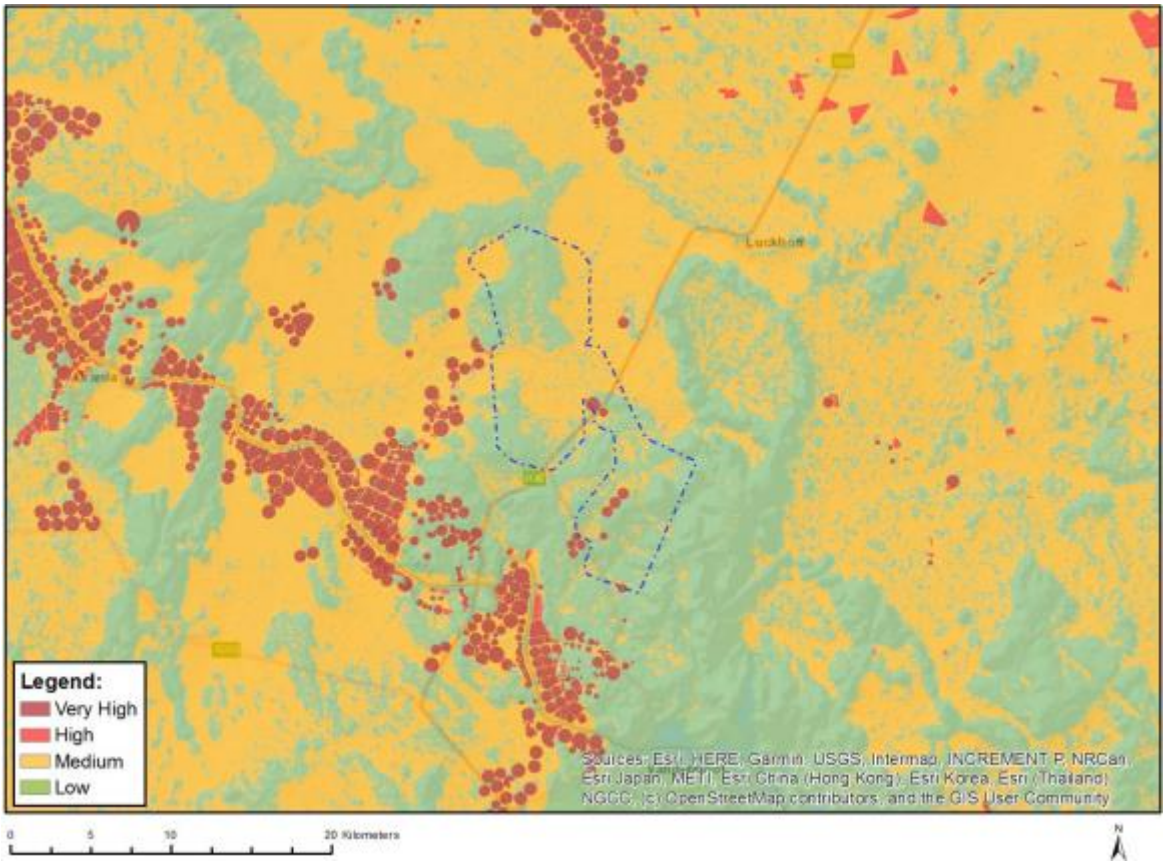

Figure 1-1 Sensitivity of agricultural features for the project area

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 and enable informed decision making. This report aims to also present and discuss the findings from the soil resources identified within the regulated 50 m,

the soil suitability and land potential of these soils, the land uses within the regulated area and also the risk associated with the proposed project.

1.1 Project Description

JN Venter Beleggings Trust is proposing an agricultural development and on a site located South-West of Luckhoff and Koffiesfontein in the Free State Province. The proposed area of development is accessible via the R48. This expansion will be developed on farms Weltevreden 755, Lemoen-spruit 667 and Diepdraai 754. The total area on all three portions is 4 800 ha, however only 2 690 ha is proposed for development. The study area falls within the Letsemeng Local Municipality within the Xhariep District Municipality. The agricultural development will entail the following at a minimum:

- Development of centre pivot areas (cultivation and irrigation) which is planned to take approximately 2 154 ha or more within the project site;
- Two irrigation water storage dams, with a combined surface area of 82 ha in extent;
- Construction of an irrigation pipeline network from the existing irrigation dams to the centre pivot areas;
- A new pump station taking a total surface area of 549m^2;
- A 5MW solar PV facility occupying an area of 9 ha, and an associated overhead powerline of ~6.9 km in length; and
- A Battery Energy Storage System covering a surface area of 0.36 ha.

The proposed development will require the following infrastructure:

Infrastructure	Purpose
Centre Pivot (Cultivation and Irrigation System)	2 154 ha for cultivation
Irrigation Pipeline Network	Irrigation pipeline network to take water from the dams to the various centre pivot areas for irrigation
Two Water Storage Systems	Two main storage dams are proposed for utilization on the agricultural development. Dam 1 – 3.1 million m^3 Dam 2 – 1 million m^3
Pump station	A new pumpstation will facilitate the required water from the Oranje Riet canal to the proposed storage dams. Total surface area of 549 m^2
Solar PV area and overhead power line	Solar PV is proposed as the main energy source for the pump and pipeline system which will irrigate the entire development area as well as the dams. 9 ha surface area with three alternative sites being considered.
Battery Energy Storage System	A battery system will be used to collect any additional power generated by the PV facility for use as and when required.

1.2 Background

A previous soil survey study was conducted to access the available soils in the three respectively farms within the project area namely; Weltevreden, Lemoenspruit and Diepdraai farms. The identified soil forms following the Soil Classification Working Group (1991) within the assessment area were categorised into two main groups; the dominant and subdominant soils. The project area is associated with well-drained red and brown soils with also the occurrence of other soils dominated with carbonates/lime being present. Shallow and

saturated profiles with signs of wetness are also found within the proposed project area. The soil findings from the study were summarised below (see ***Table 1-1***). The respective diagnostic horizons for each soil form are shown in the blankets.

Table 1-1 Soil forms within the assessment project area.

Soil group	Dominant soil form	Subdominant soil form
Apedal/ young soils	• Hutton (*Orthic/Red apedal*) • Plooysburg (*Orthic/Red apedal/Hard carbonate*) • Prieska (*Orthic/Neocarbonate/Hard carbonate*) • Kimberley (*Orthic/Red apedal/Soft carbonate*) • Addo (*Orthic/Neocarbonate/Soft carbonate*) • Augrabies (*Orthic/Neocutanic*)	• Oakleaf (*Orthic/Neocutanic*)
Duplex soils	• Sepane (*Orthic/Pedocutanic/Gley*) • Valsrivier (*Orthic/Pedocutanic*) • Swartland (*Orthic/Pedocutanic/Lithic*)	-
Alluvial soils	-	• Montagu (*Orthic/Neocarbonate/Unconsolidated material*)
Shallow soils	• Glenrosa (*Orthic/ Lithic*)	• Glenrosa (*Orthic/Lithic*)
Saturated soils	• Katspruit (*Orthic/Gley*)	-

1.2.1 Soil distribution

The project area is commonly dominated with the Hutton, Valsrivier and Glenrosa soil forms (see Figure 1-2). In the terrain soils associated with the presence of lime or carbonates also occur. The soil profiles characterised with high carbonate subsurface horizons which were identified within the assessment area includes the Addo, Augrabies and Plooysburg soil forms. The area has few profiles that are saturated for long periods with surface water such as the Katspruit soil form (see Figure 1-2). Most of the identified soils are freely drained due to their apedal weak structure which can be suitable for irrigation purposes. Limitations in water drainage is usually common in duplex soils with higher clay contents in the subsurface horizons that can restrict profile flows. Such soils require proper drainage systems to increase their productive.

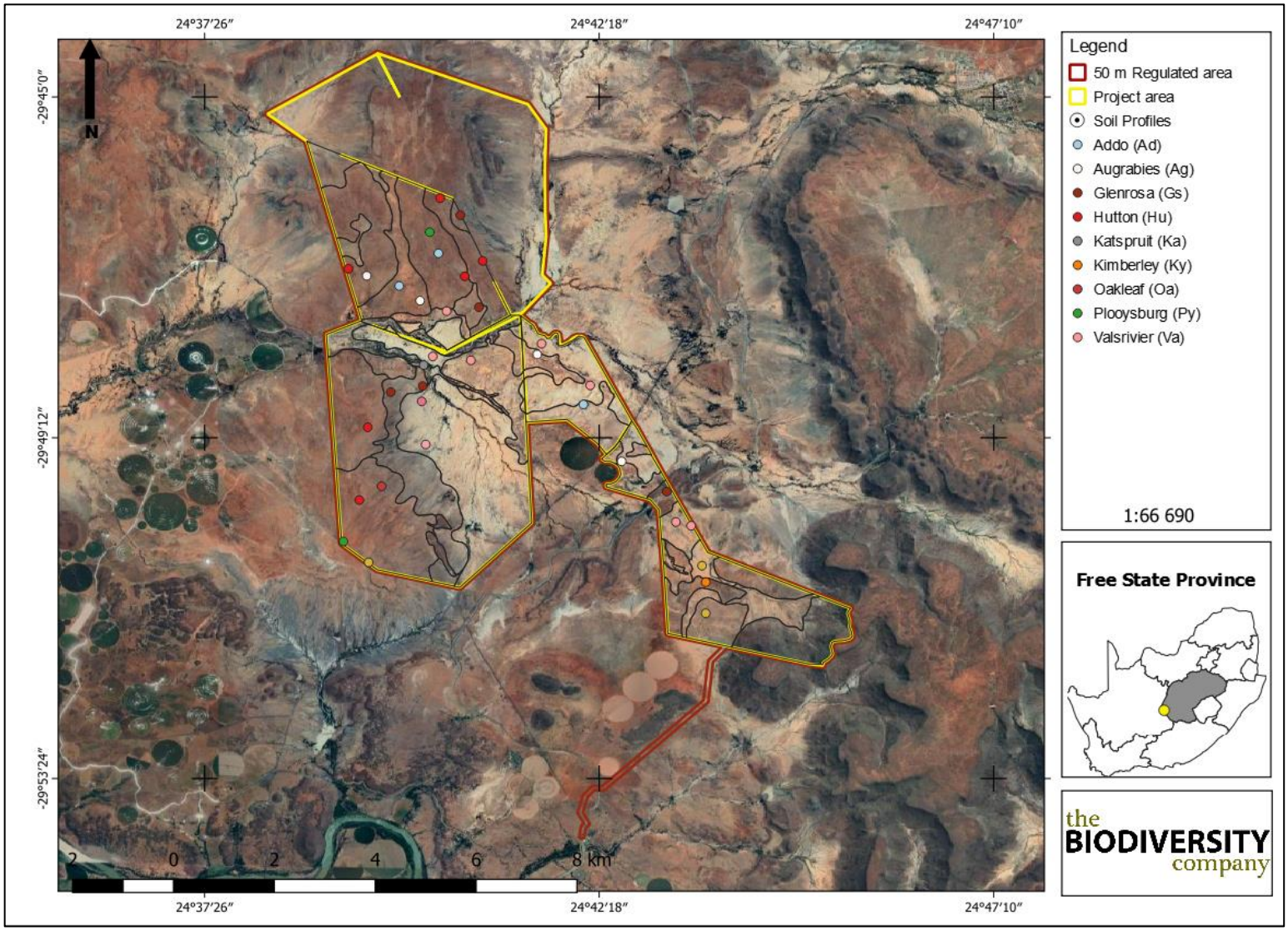

Figure 1-2 Map of soil forms identified within the project area and classified following the Soil Classification Working Group (1991)

1.3 Scope of Work

According to the National Web based Environmental Screening Tool, the proposed development is located within a "Medium" 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.

1.4 Expertise of the Specialists

1.4.1 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.

1.4.2 Matthew Mamera

Matthew Mamera is a Cand. Sci Nat registered (116356) in natural and agricultural sciences, 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,

[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).

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).

2 Project Area

The proposed centre pivot expansion irrigation project is located south-west of Luckhoff and Koffiesfontein in the Free State Province (see Figure 2-1). The proposed area of development is accessible via the R48. This expansion will be found on farms Weltevreden 755, Lemoen-spruit 667 and Diepdraai 754. The total area on all three portions is 4800 ha, however only 2690 ha is proposed for development. The study area falls within the Letsemeng Local Municipality within the Xhariep District Municipality. The surrounding land use includes agricultural activities (Crop and animal) predominantly.

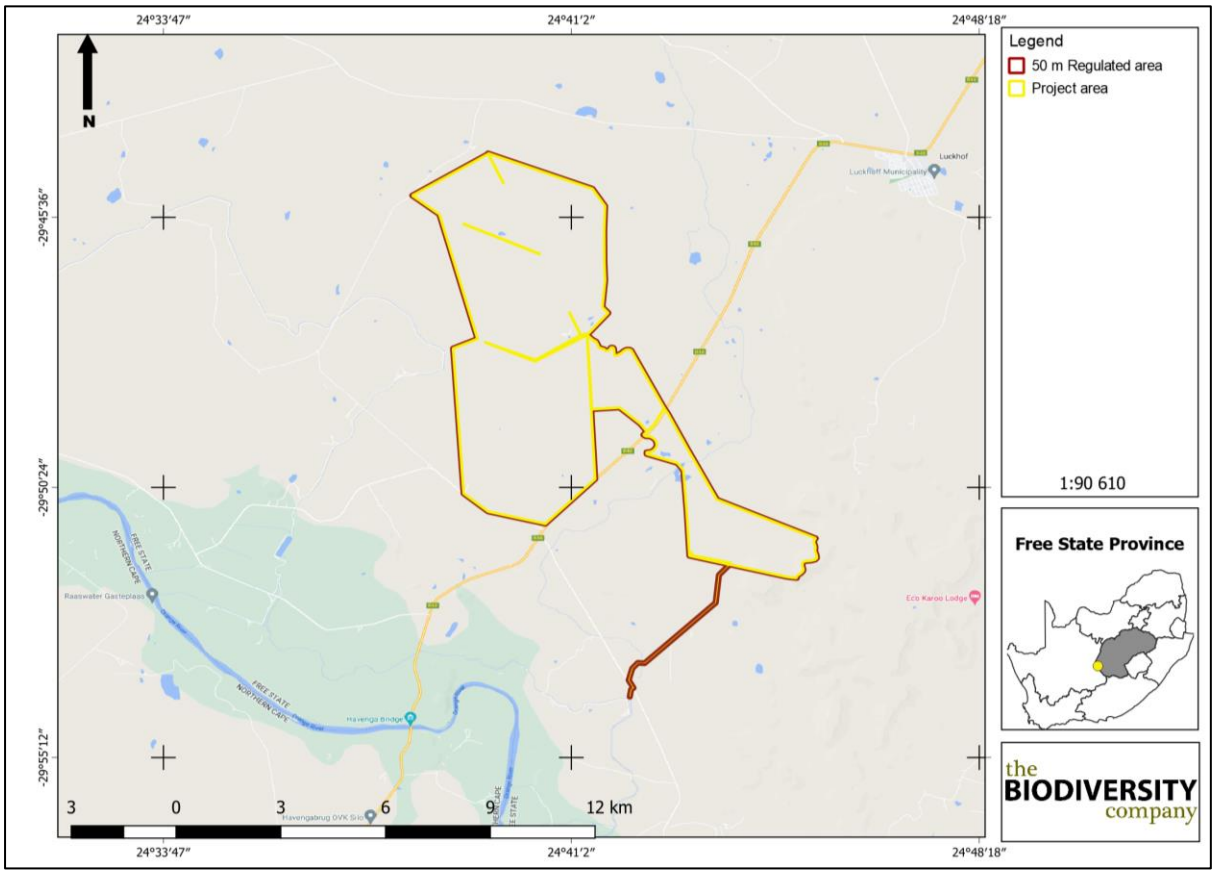

Figure 2-1 The location of the project area

3 Methodology

3.1 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.

3.2 Field Survey

An assessment of the soils present within the project area was conducted during a field survey in June 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.

3.3 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 3-1 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 3-1 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 3-2. The final land potential results are then described in Table 3-3.

Table 3-2 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 3-3 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

4 Project Area

4.1 Soil and Geology

According to the land type database (Land Type Survey Staff, 1972 - 2006), the project area is characterised by the Ae 278, Ag150, Ag151, Da 24, Da103 and Ib 207 land types. The Ae and Ag land types are characterised with Hutton and Clovelly soil forms which are red-yellow apedal and freely drained soils according to the Soil Classification Working Group, (1991) with the possibility of other soils and bare rocks also occurring. The Da land types commonly have duplex soils like the Swartland, Valsrivier as well as other associated soils that includes, Oakleaf, Mispah and Glenrosa soil forms. The Ib land types are characterised with Mispah and Swartland soil forms associated with other miscellaneous soils and bare rocks in the terrains. Red mesotrophic and eutrophic soils also occur in the area, associated with shallow and rocky profiles in the upper terrains. Lime is mostly absent in the upper areas and can occur in the lower areas. The land terrain units for the featured Ae 278 land type are illustrated in Figure 4-1 with the expected soils listed in Table 4-1; Ag 150 land type in Figure 4-2 and Table 4-2; Ag 151 land type in Figure 4-3 and Table 4-3; Da 24 in Figure 4-4 and Table 4-4; Da 103 in Figure 4-5 and Table 4-5; Ib 207 in Figure 4-6 and Table 4-6.

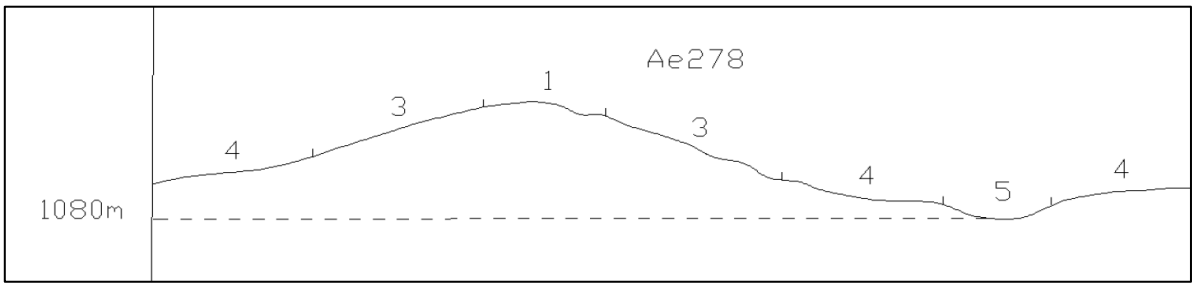

Figure 4-1 Illustration of land type Ae 278 terrain unit (Land Type Survey Staff, 1972 - 2006)

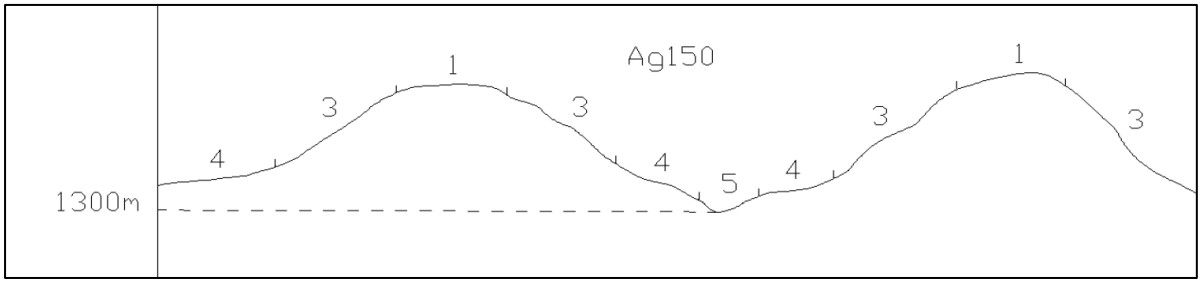

Figure 4-2 Illustration of land type Ag 150 terrain unit (Land Type Survey Staff, 1972 - 2006)

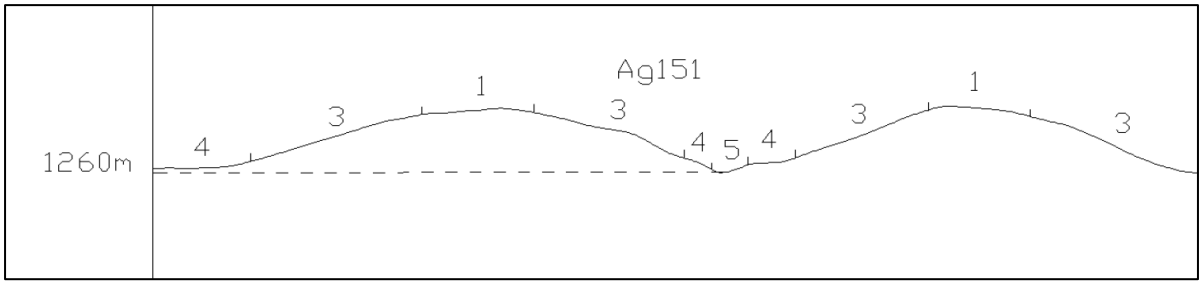

Figure 4-3 Illustration of land type Ag 151 terrain unit (Land Type Survey Staff, 1972 - 2006)

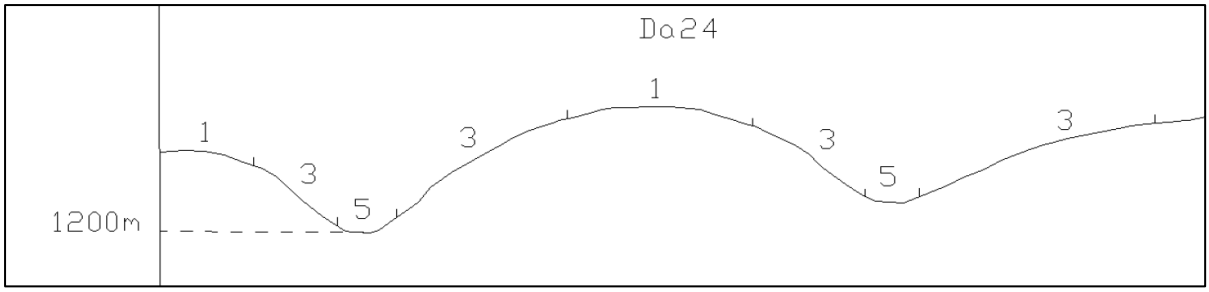

Figure 4-4 Illustration of land type Da 24 terrain unit (Land Type Survey Staff, 1972 - 2006)

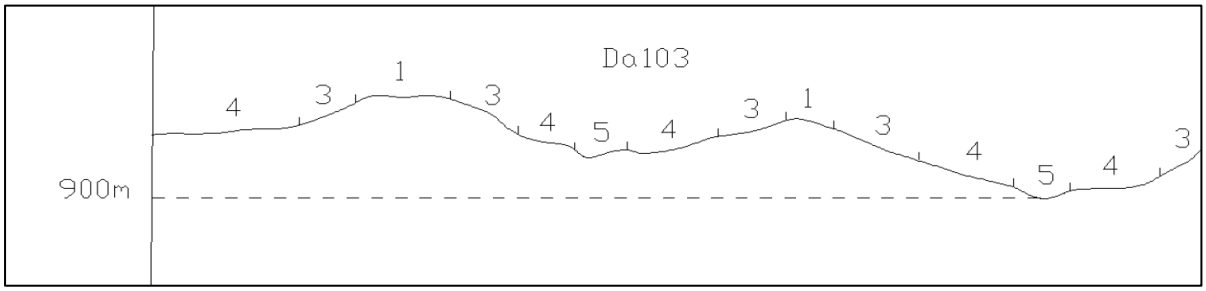

Figure 4-5 Illustration of land type Da 103 terrain unit (Land Type Survey Staff, 1972 - 2006)

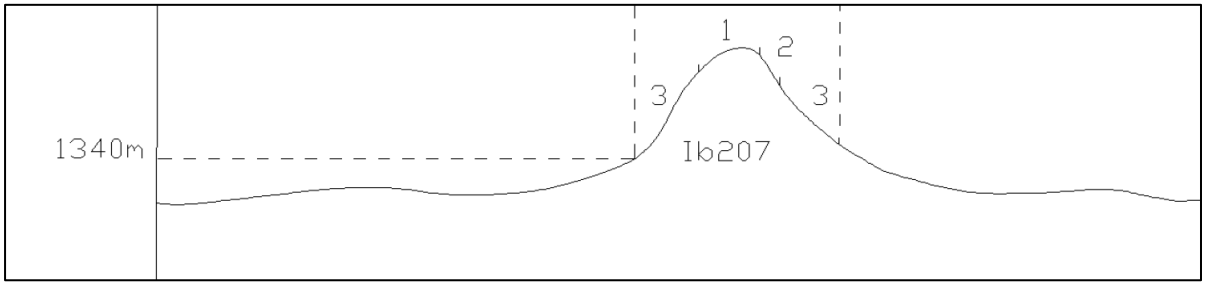

Figure 4-6 Illustration of land type Ib 207 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 4-1 Soils expected at the respective terrain units within the Ae 278 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (10%)		**3 (45%)**		**4 (40%)**		**5(5)**	
Hutton	60%	Hutton	55%	Hutton	35%	Clovelly	40%
Mispah	25%	Clovelly	25%	Clovelly	35%	Hutton	30%
Clovelly	15%	Mispah	10%	Oakleaf	15%	Oakleaf	15%
		Valsrivier	5%	Valsrivier	10%	Valsrivier	10%
				Mispah	5%	Stream beds	5%

Table 4-2 Soils expected at the respective terrain units within the Ag 150 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units			
1 (30%)	**3 (45%)**	**4 (20%)**	**5(5)**

Bare rocks	50%	Hutton	50%	Hutton	65%	Hutton	30%
Mispah	30%	Bare Rocks	20%	Mispah	20%	Bare Rocks	25%
Hutton	10%	Mispah	20%	Bare Rocks	10%	Mispah	25%
Shortlands	10%	Shortlands	10%	Shortlands	5%	Shortlands	10%
						Oakleaf	10%

Table 4-3 Soils expected at the respective terrain units within the Ag 151 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (30%)		**3 (55%)**		**4 (7%)**		**5(8)**	
Bare rocks	60%	Hutton	72%	Hutton	50%	Hutton	40%
Mispah	15%	Bare Rocks	10%	Valsrivier, Oakleaf	30%	Oakleaf	35%
Glenrosa	10%	Mispah	8%	Bare Rocks	%	Stream beds	15%
Hutton	10%	Shortlands	5%	Mispah	5%	Bare Rocks	10%
Shortlands	5%			Glenrosa	5%	Oakleaf	5%
				Shortlands	5%	Glenrosa	5%

Table 4-4 Soils expected at the respective terrain units within the Da 24 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units					
1 (95%)		**3 (3%)**		**5 (2%)**	
Swartland	55%	Bare Rocks	35%	Oakleaf	30%
Mispah	20%	Mispah	30%	Valsrivier	30%
Bare Rocks	10%	Swartland	25%	Swartland	28%
Glenrosa	10%	Glenrosa	5%	Bare Rocks	5%
Hutton	5%	Hutton	5%	Mispah	5%
				Stream beds	2%

Table 4-5 Soils expected at the respective terrain units within the Da 103 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (5%)		**3 (10%)**		**4 (70%)**		**5(15)**	
Mispah	60%	Glenrosa	45%	Swartland, Valsrivier	65%	Swartland, Valsrivier	40%
Glenrosa	30%	Mispah	35%	Glenrosa	10%	Oakleaf	35%
Swartland, Valsrivier	10%	Swartland, Valsrivier	20%	Oakleaf	20%	Pans	15%
				Mispah	5%	Glenrosa	5%

Table 4-6 Soils expected at the respective terrain units within the Ib 207 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (10%)		**2(5%)**		**3 (80%)**		**5(5)**	
Bare rocks	30%	Bare Rocks	100%	Bare Rocks	75%	Bare Rocks	35%
Mispah	25%			Mispah	10%	Mispah	20%
Swartland	25%			Glenrosa	5%	Glenrosa	15%
Glenrosa	20%			Swartland	5%	Valsrivier	15%
				Shortlands	5%	Stream beds	5%

4.2 Terrain

The slope percentage of the project area has been calculated and is illustrated in Figure 4-7. Most of the project area is characterised by a slope percentage between 0 and 5%, with some smaller patches within the project area characterised by a slope percentage ranging from 5 to 15%. This illustration indicates a non-uniform topography in scattered areas the majority of the area being characterised by a gentle slope. The DEM of the project area (Figure 4-8) indicates an elevation of 689 to 746 Metres Above Sea Level (MASL).

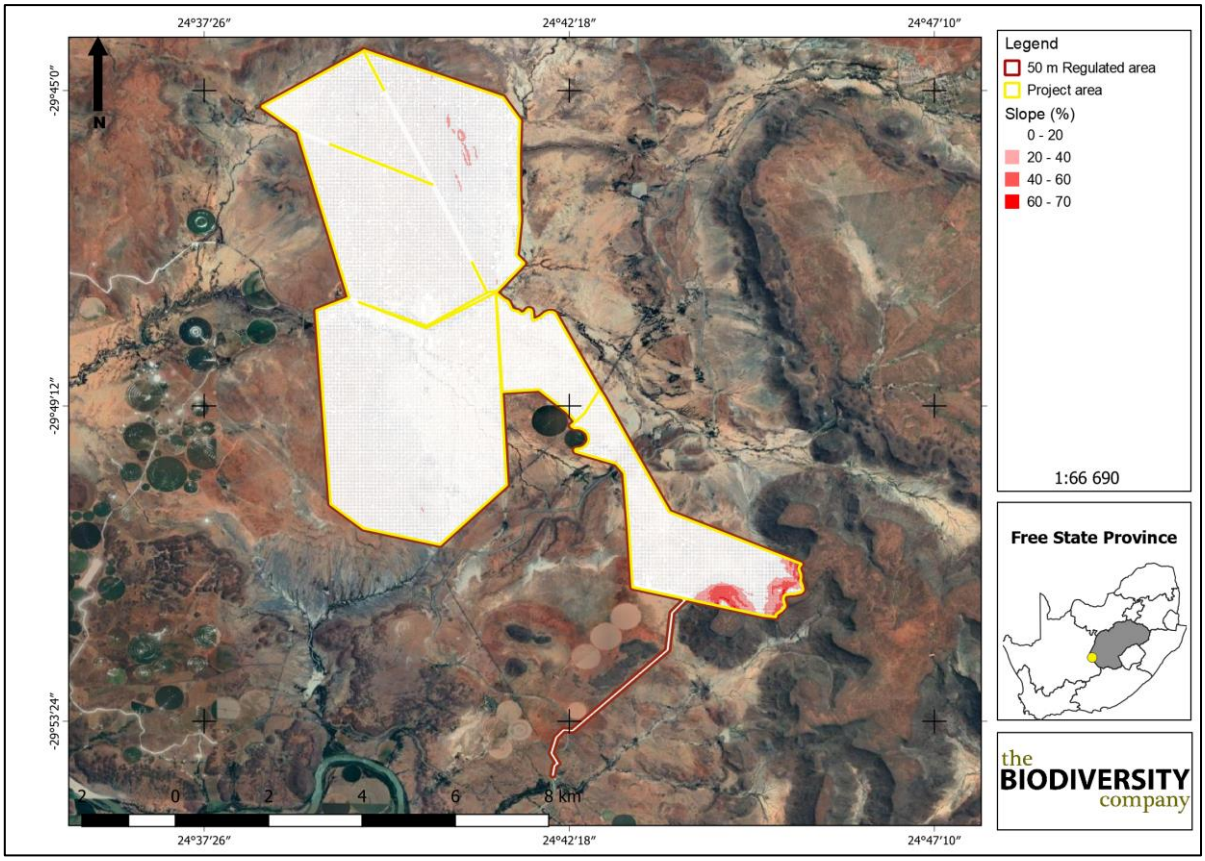

Figure 4-7 The slope percentage calculated for the project area

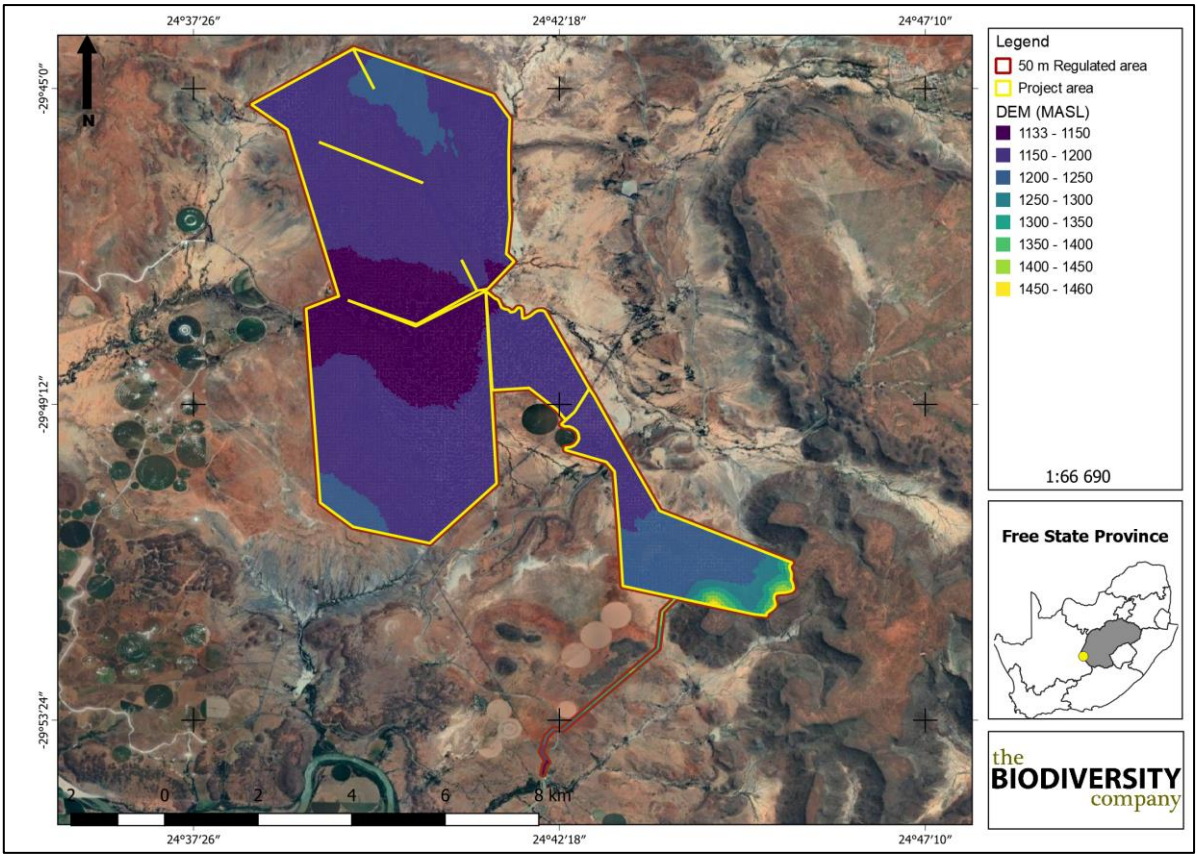

Figure 4-8 The DEM generated for the project area.

5 Results and Discussion

5.1 Baseline Findings

The most sensitive soil forms identified within the assessment area is the Oakleaf, Hutton and Augrabies soil forms, with other associated soils also occurring. The Oakleaf soil form consists of an orthic topsoil on top of a thick neocutanic subsurface horizon. The Hutton soil form has an orthic topsoil underlain with a thick red apedal horizon below. The Augrabies soil form consists of an orthic topsoil with a thick neocarbonate horizon below.

The land capability of the above-mentioned soils has been determined to have land capability classes of “III” and “IV”. The assessment area has a climate capability level 8, characterised with low Mean Annual Precipitation (MAP) and high Mean Annual Potential Evapotranspiration (MAPE) rates. The harsh climatic conditions can limit crop production significantly. The combination between the determined land capabilities classes and climate capabilities results in a land potential “L6” for all the soils within the assessment footprint. The “L6” land potential level is characterised by a very restricted potential. Regular and/or severe to limitations occur due to soil, slope, temperatures or rainfall. Non-arable.

5.2 Sensitivity Verification

The following land potential level has been determined;

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

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 Sensitivity);
- Land Capability 6 to 8 (Low to Moderate Sensitivity) and;

The land capability sensitivity (DAFF, 2017) indicates a range of sensitivities expected throughout the project focus area, which predominantly covers “Very Low” to “Low” sensitivities. Some patches are characterised by “Moderate” sensitivities (see Figure 5-1). The area has a “Low” sensitivity based on these land potential classes. The “Very Low to Moderate” sensitivities baseline findings concur with the DAFF, (2017) land potential for the requirements for a compliance statement report only. According to the DEA Screening Tool, (2022), some few portions within the assessment area has “High” sensitivity crop fields (see Figure 5-2). Since rainfall is one of the limiting factors for crop production in the assessment area, the agricultural pivot expansion project can increase the land potential without segregation of such agricultural lands or crop fields with high potentials. In the case the landowners of such crop fields are not part of the expansion project, it is the specialist`s recommendation that such high potential crop fields be avoid for the project. In a case relocating of the project is not feasible, the stakeholders should engage with the owners of the crop fields for an appropriate compensation. Thus, the agricultural and pivot expansion project maybe favourably considered as planned.

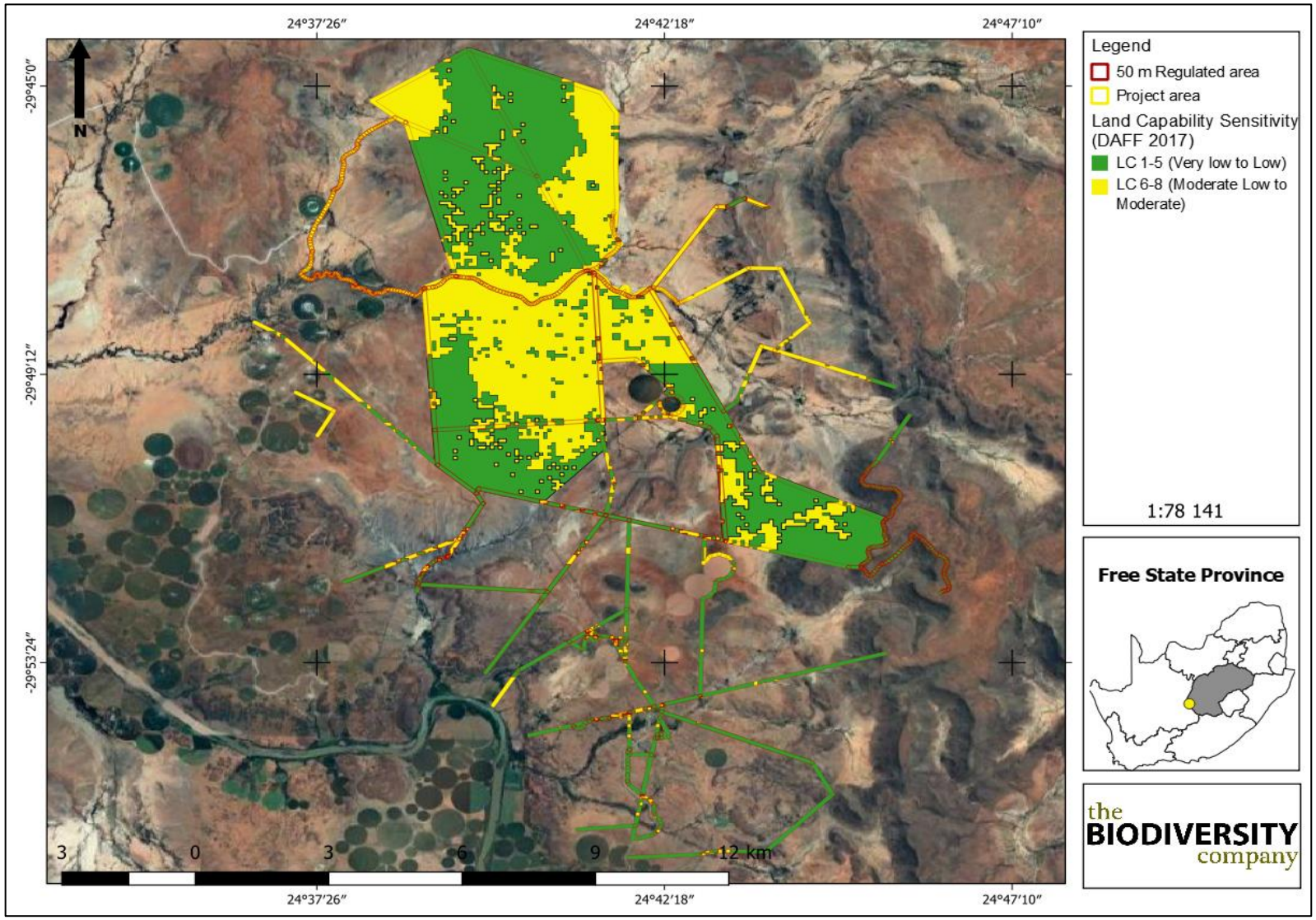

Figure 5-1 The land capability sensitivity (DAFF, 2017)

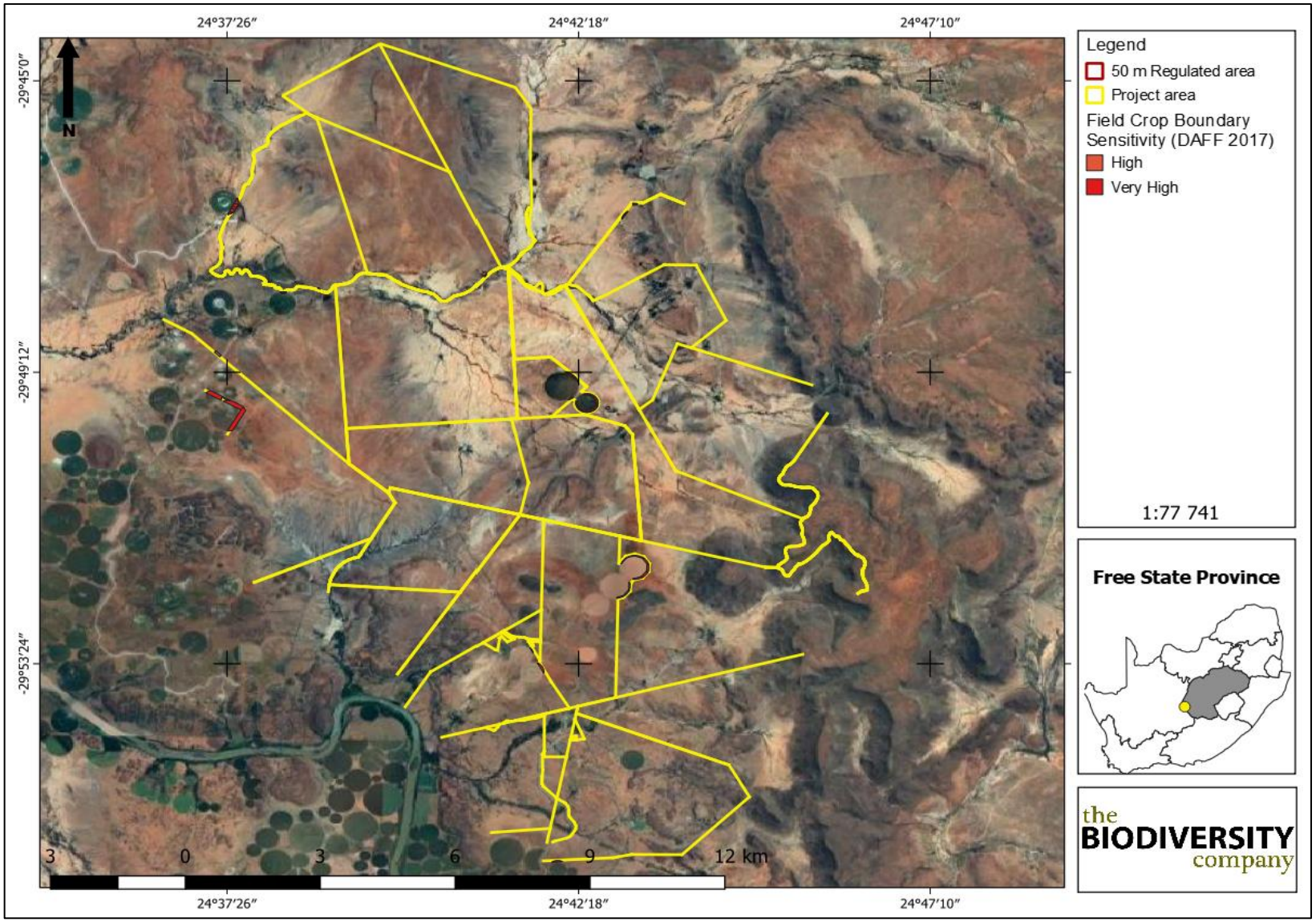

Figure 5-2 The land capability sensitivity (DAFF, 2017)

6 Conclusion

The most sensitive soil forms identified within the assessment corridor is the Oakleaf, Hutton and Augrabies soils. The land capability sensitivities (DAFF, 2017) indicate land capabilities with “Very Low” to “Moderate” sensitivities, which correlates with the findings from the baseline assessment. The area has land capability classes of “III” and “IV” with a climate capability level “C8” associated with harsh conditions. The assessment area is characterised with a land potential class level “L6” for all the soils. The footprint area is associated with non-arable soils, which correspond to the current land use of livestock grazing and irrigated crop production in the area.

In the assessment area, they are few portions with “Very High” and “High” sensitivity crop fields according to the DEA Screening Tool, (2022). However, since the climate is one of the limiting factors for crop production in the project area. Amendments in the report were made for the sensitivities in the assessment area following the project area changes and not the soil baseline findings. The agricultural and pivot expansion project will not impact or segregate the land potential capability of such fields. In the case, the crop fields are not part of the expansion project, the stakeholders should rearrange the associated infrastructure around such crop fields to preserve them. If relocating the infrastructure is not feasible, the stakeholders can also engage with the landowners for an appropriate compensation. It is therefore the specialist recommendation that, the agricultural and pivot expansion project maybe favourably considered.

7 References

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