AGRICULTURAL ASSESSMENT FOR WELVENPAS – BLOK 07, WESTERN CAPE PROVINCE

PREPARED FOR

ENVIROAFRICA

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TABLE OF CONTENTS

List of Figures

List of Tables

BACKGROUND TO THE STUDY

Digital Soils Africa (Pty) LTD (DSA) were tasked on behalf of EnviroAfrica to undertake and prepare an Agricultural Assessment for the Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), Environmental Impact Assessment ("EIA") Regulations, 2014. As per GN960 of 2019, read with Section 24(5)(a) of the NEMA, an Environmental Screening Report (ESR) was generated for the application using the National Web-based Screening Tool. The ESR classifies the area as being of high sensitivity for the Agricultural theme.

The Agricultural Assessment is reported according to the protocol for the specialist assessment and minimum report content requirements for the environmental impacts on agricultural resources (GN320 of 2020).

SITE LOCATION

The proposed Welvenpas site is a historic farm located in the Bovlei valley of Wellington next to Bainsloof pass, Western Cape province, South Africa (Figure 1).

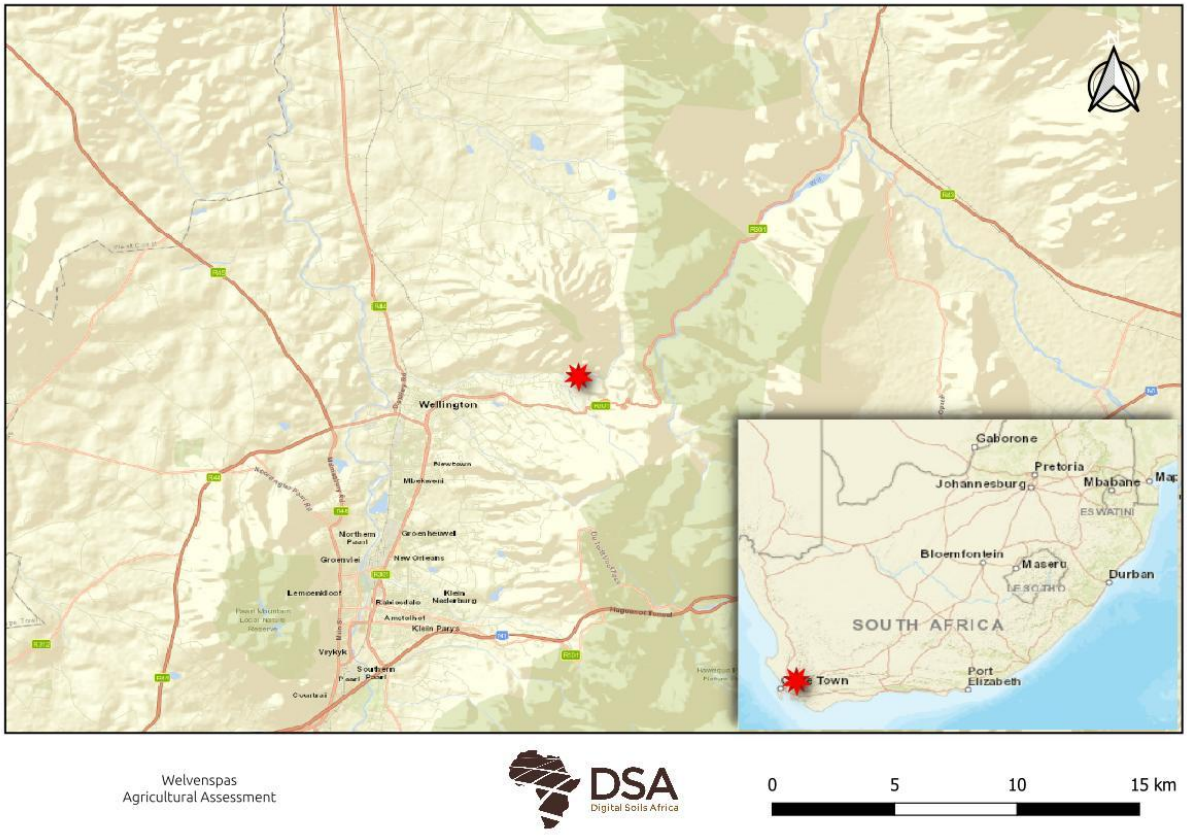


FIGURE 1: LOCATION OF THE STUDY AREA IN WESTERN CAPE PROVINCE.

The proposed site covers approximately 2.2 ha of land (Figure 2).

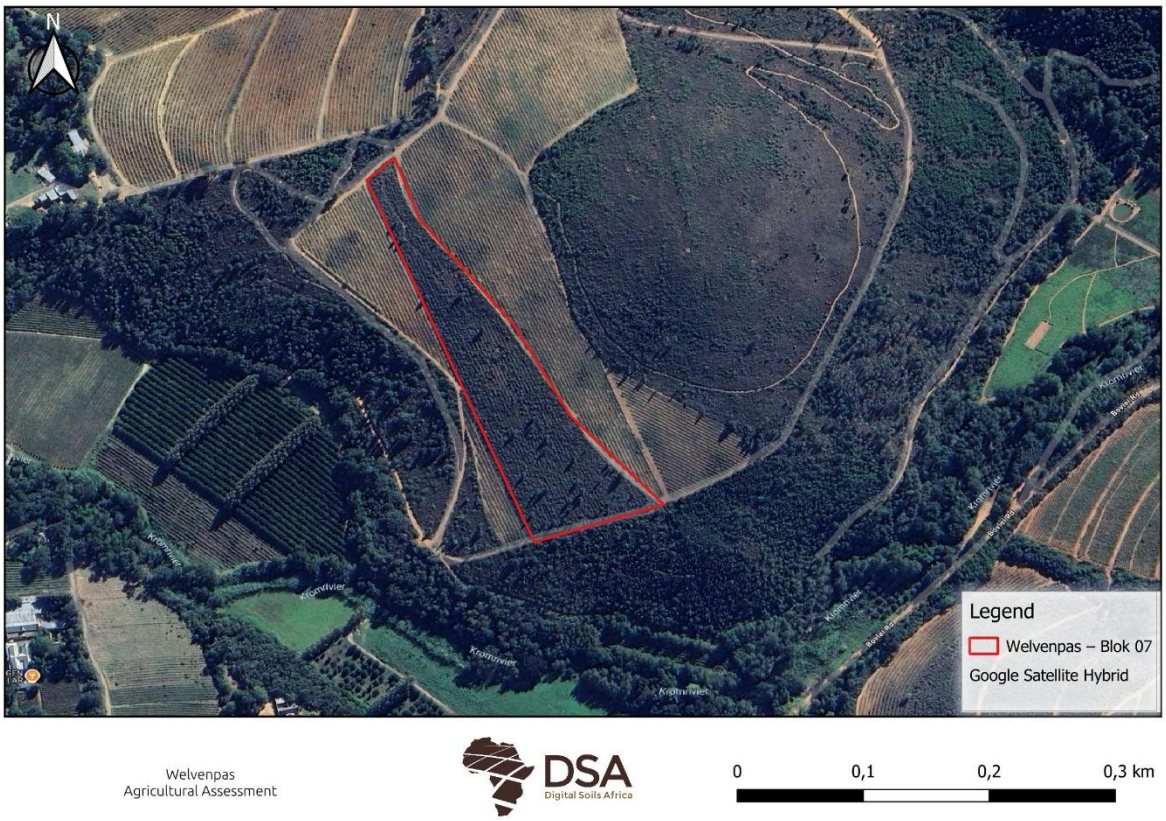


FIGURE 2: THE LAYOUT OF THE PROPOSED DEVELOPMENT SITE (FOCUS AREA).

ENVIRONMENTAL SCREENING TOOL

An Environmental Screening Report (ESR) was generated for the application using the National Web-based Screening Tool. The ESR classifies the area as being of very high sensitivity for the *Agricultural* theme.

Agricultural sensitivity, as reported in the screening tool, is based upon the land use (SANLC, 2014) and land capability (Department of Agriculture, Forestry and Fisheries, 2017, also referred to as DAFF, 2017).

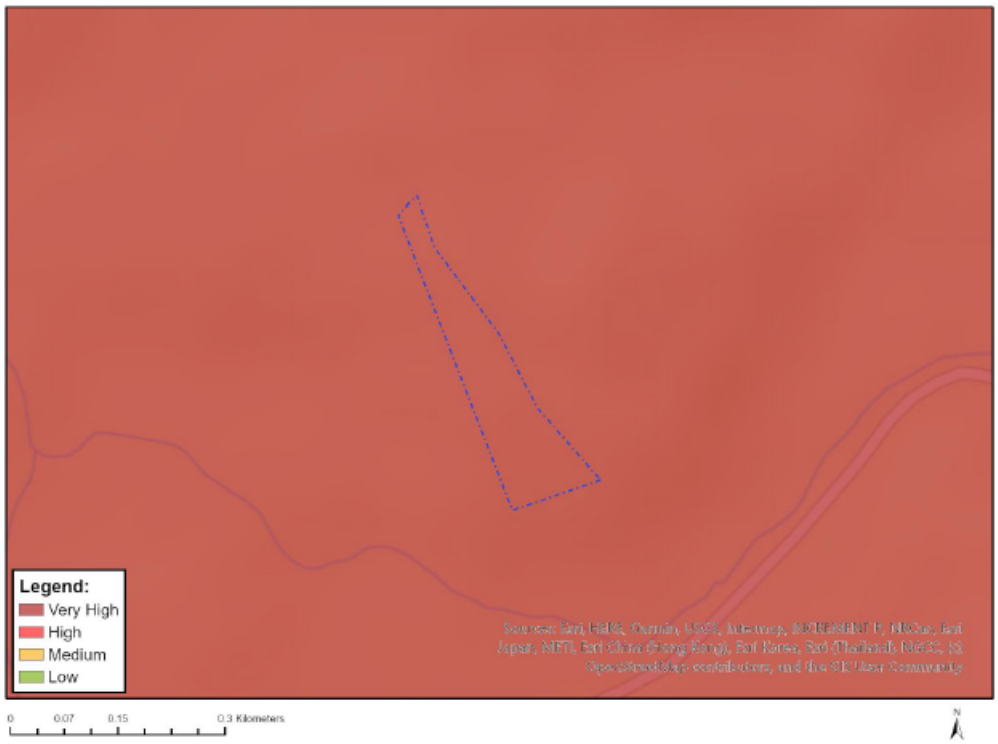
All cultivated land is considered a high sensitivity, while irrigation and unique crops, are considered very high sensitivity, irrespective of the land capability. The land use in the screening tool is based on the South African Nation Land Cover (SANLC, 2014). Meanwhile, there have been two more updated versions of the land use (2018 and 2020).

According to the Department of Agriculture, Forestry and Fisheries (2017), land capability is defined as the most intensive long-term use of land for purposes of rainfed farming

determined by the interaction of climate, soil, and terrain. The following weight was given to each attribute when calculating the Land Capability:

Land capability = Climate (40%) + Terrain (30%) + Soil (30%)

According to the National Web based Environmental Screening Tool, the agricultural sensitivity is classified all the study area as very high agricultural sensitivity (Figure 3). The land capability (DAFF, 2017) classifies the soils as having low to medium land capability (Figure 4). There are cultivated crops in the area (Figure 5).



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Rainfed Annual Crop Cultivation / Planted Pastures
Low	04. Low-Very low
Low	05. Low
Medium	06. Low-Moderate
Medium	07. Low-Moderate
Very High	Viticulture
Very High	Stellenbosch PAA

FIGURE 3: RESULTS FROM THE ENVIRONMENTAL SCREENING TOOL.

FIGURE 4: RESULTS FROM THE ENVIRONMENTAL SCREENING TOOL.

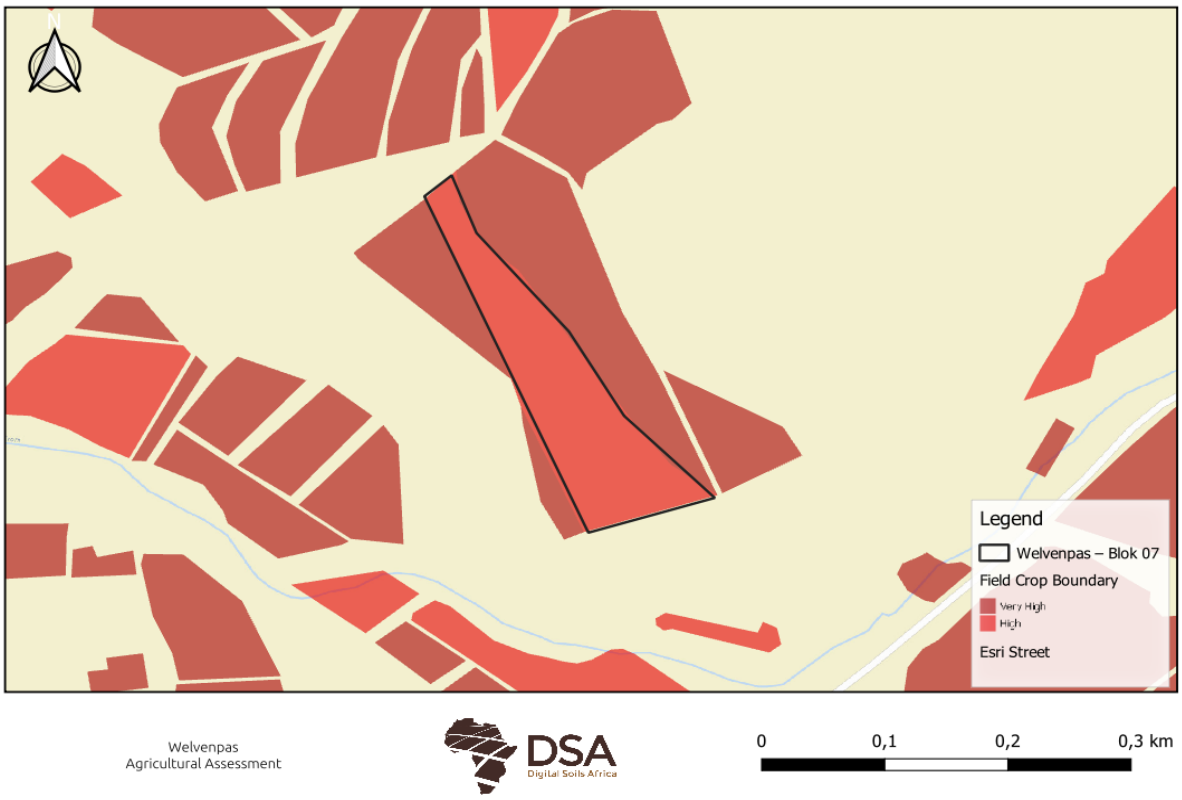


FIGURE 5: THE FIELD CROP BOUNDARIES AS USED IN THE SCREENING TOOL.

Preservation and Development of Agricultural Land Framework Act (PD-ALF) is in the process of being published. The new statutory framework will replace the Subdivision of Agricultural Land Act, Act 70 of 1970.

Protected Agricultural Area, as in the draft framework, is defined as *"an agricultural land use zone, protected for purposes of food production and ensuring that high potential and best available agricultural land are protected against non-agricultural land uses in order to promote long-term agricultural production and food security."*

The study area is situated within a Protected Agricultural Area (Figure 6).

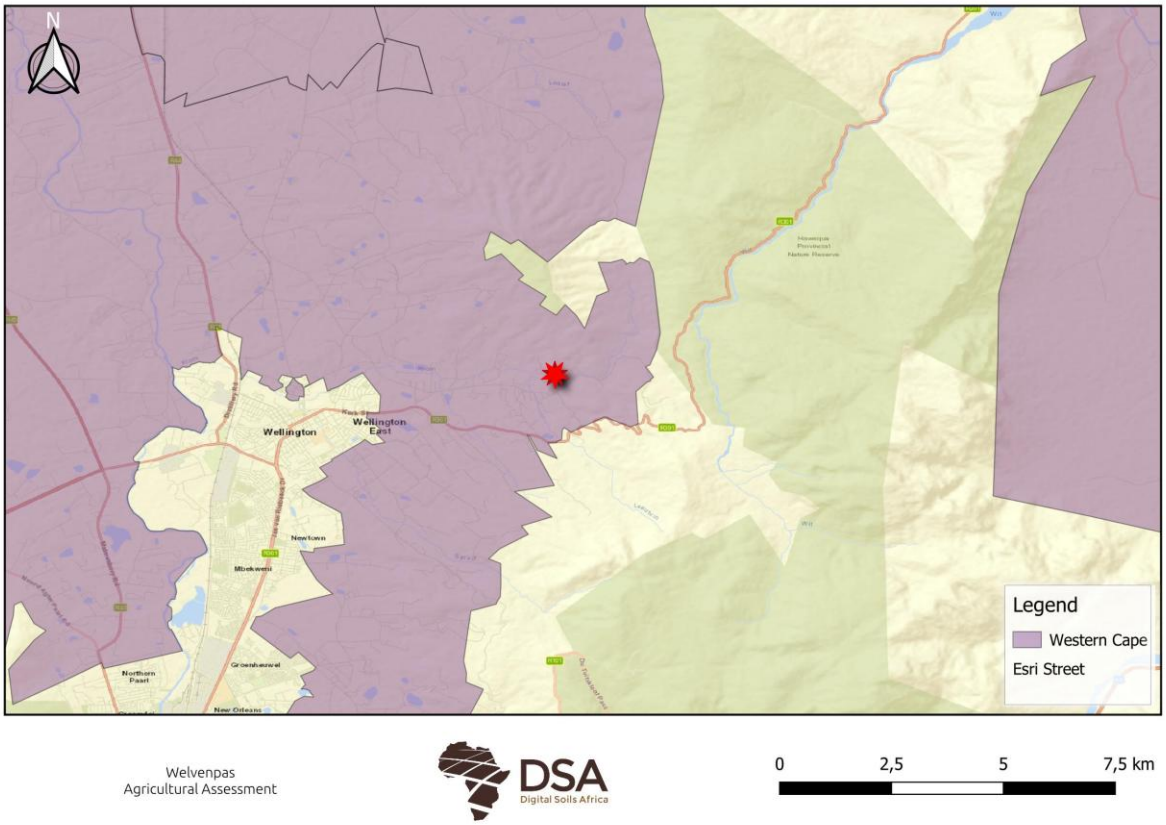


FIGURE 6: THE PROTECTED AGRICULTURAL AREAS FOR THE STUDY AREA.

DATA LIMITATIONS, ASSUMPTIONS AND STUDY GAPS

It is assumed that the data used in the desktop is correct.

METHODOLOGY

DESKTOP STUDY

A desktop study was being conducted to determine the climate, agricultural potential, soil land-use from the best available sources.

- Climate (Climate.data.org).
- Agricultural potential from the Land Type Survey Staff (1972-2006).
- The Refined Land Capability Evaluation Raster Data for South Africa that was developed using a spatial evaluation modelling approach (DALRRD, 2016).
- Land-use from South African National Land Cover (Geo Terra Image, 2018).
- Long Term Grazing Capacity for South Africa from Department of Agriculture, Forestry and Fisheries (2016).
- Historical imagery (Google earth pro).

FIELD VISIT

The field survey was conducted on the 8th and 9th of April 2024. During the field survey visual observations and soil observations made with a hand auger were all logged using a GPS.

- The soils were described and classified according to the Soil Classification Working Group (2018).
- Visual observations of land degradation, crops and land-use were made. The data will be compared to the soils data from the land type survey and the agricultural capability, as well as the land-use map, will be refined.

DESKTOP RESULTS

CLIMATE CAPABILITY

Welvenpas' climate is a mild and moderate climate. There is more rainfall in the winter months than in the summer months. The climate here is classified as Csa by the Köppen-Geiger. The temperature here averages 16.9 °C. Each year, there is an approximate 821 mm of precipitation that occurs. The site also has a Semi-Arid climate (Figure 7).

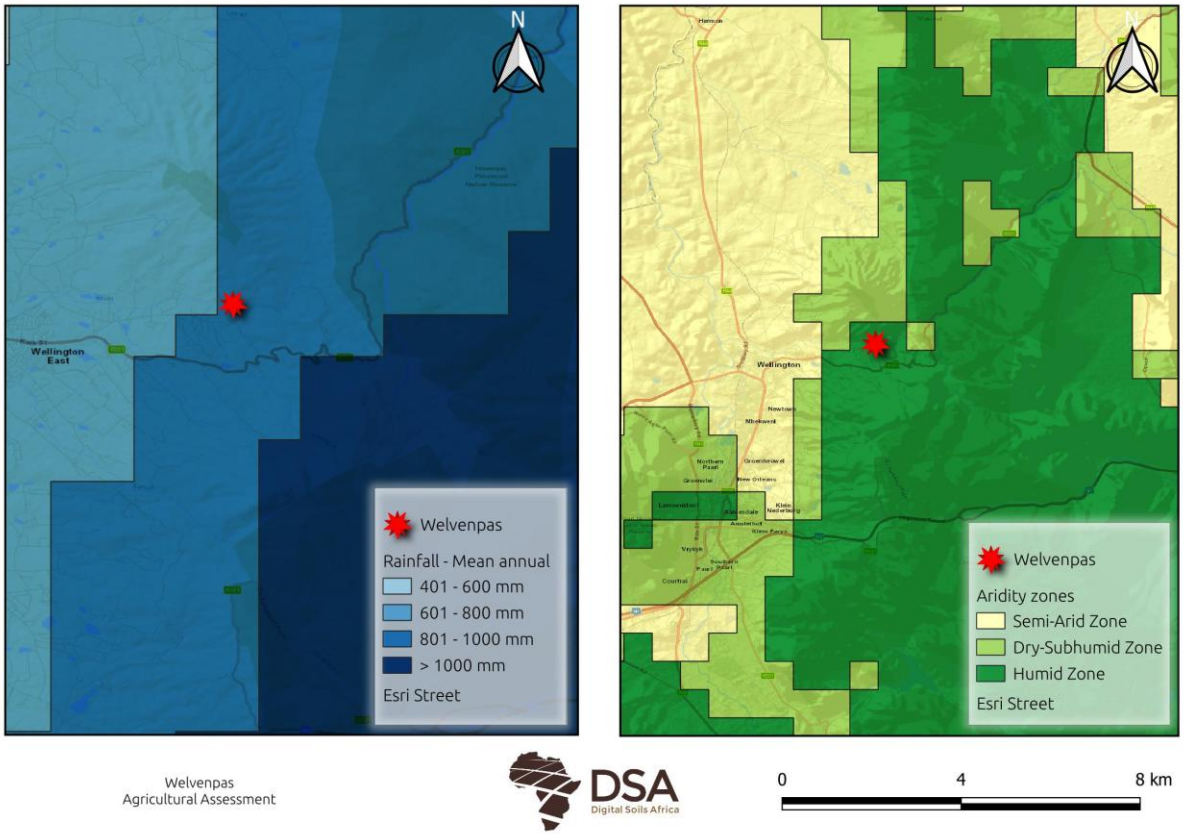


FIGURE 7: CLIMATE OF THE SITE AND THE SURROUNDING AREA (SCHULZE, 2007).

TABLE 1: CLIMATIC PROPERTIES OF WELLINGTON, WESTERN CAPE (CLIMATE-DATA.ORG)

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C	23.1 °C	23.2 °C	21.4 °C	18.1 °C	14.4 °C	11.2 °C	10.6 °C	11.1 °C	13 °C	16.3 °C	18.6 °C	21.5 °C
Min. Temperature °C	16.3 °C	16.6 °C	15.2 °C	12.3 °C	9.4 °C	6.2 °C	5.5 °C	6 °C	7.3 °C	10.1 °C	12.1 °C	14.9 °C
Max. Temperature °C	30.4 °C	30.6 °C	28.6 °C	24.7 °C	20.3 °C	16.8 °C	16.4 °C	16.6 °C	18.7 °C	22.6 °C	25.4 °C	28.5 °C
Precipitation / Rainfall mm	21	18	22	64	102	153	134	110	77	49	44	27
Humidity (%)	51%	52%	54%	59%	69%	75%	75%	77%	73%	64%	57%	52%
Rainy days (d)	3	2	3	5	6	8	7	8	6	5	5	4
avg. Sun hours (hours)	11.0	10.4	9.5	8.1	6.7	6.1	6.3	6.1	7.0	8.9	10.0	11.0

Climate capability is highest weighted factor (40%) in the calculation of the Land capability (DAFF, 2017) which is used in the Screening Tool to determine the agricultural sensitivity. Soil capability (30%) and Terrain capability (30%) contribute the remaining considerations. The climate capability consists of 9 values, with 1 being the lowest value and 9 being the highest value (There is however no evaluation value of 1 & 2).

The Climate capability determined by the following factors:

- Moisture supply capacity (50%)
- Physiological capacity (20%)
- Climatic constraints (30%)

The climate capability of the study area according to the Department of Agriculture, Forestry and Fisheries, 2017, has a value of 6, which is considered a moderate to high climate capability (Figure 8).

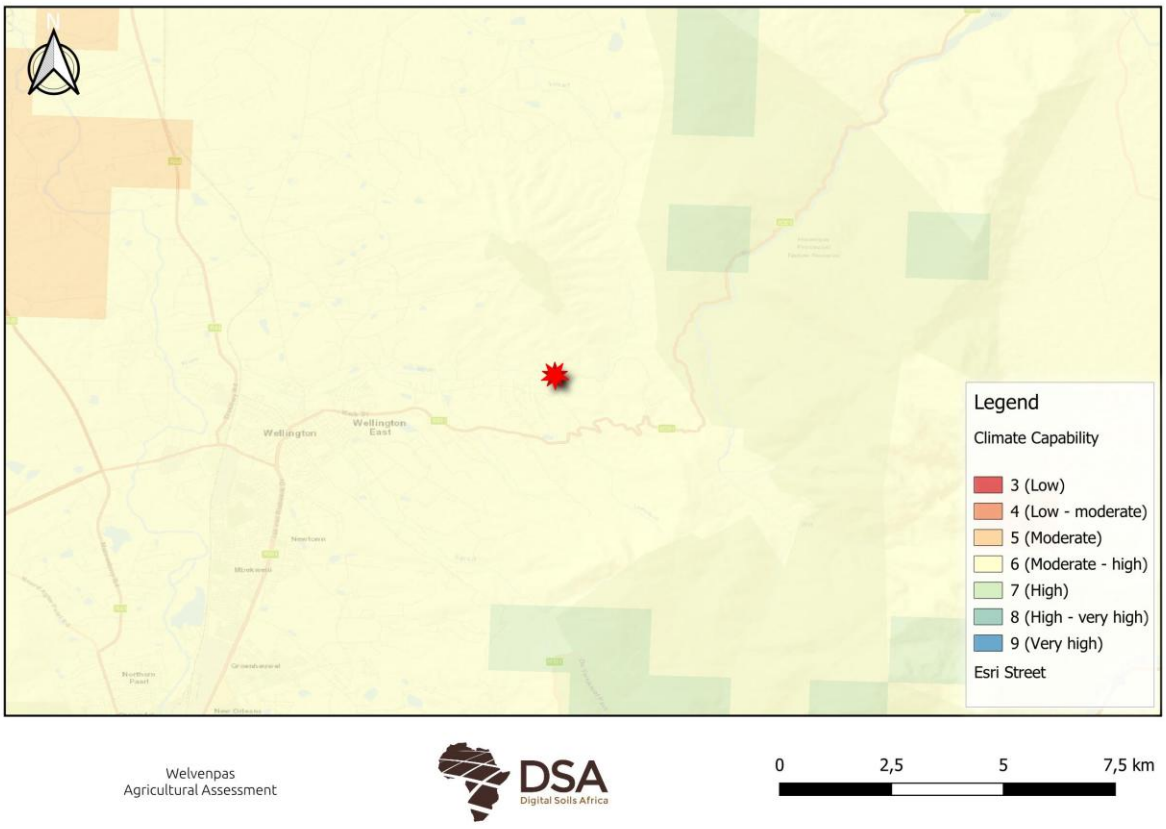


FIGURE 8: THE CLIMATE CAPABILITY OF THE SITE AND SURROUNDING AREA (DAFF, 2017).

SOIL

LANDTYPE

A land type is an area which can be demarcated at a scale of 1:250 000 with similar soil forming factors and therefore soil distribution patterns. A land type does therefore not represent uniform soil polygons, but rather information regarding the occurrence of different soils on different terrain units can be obtained from the land type inventory. Land type data was used in calculating the soil capability (DAFF, 2017), and therefore, indirectly used in the Screening tool for estimating the agricultural sensitivity.

The proposed development area is situated upon the Fa land type (Land Type Survey Staff, 1972 – 2002) (Figure 9). Fa land types are characterised by shallow soils (Mispah and Glenrosa forms) with little or no lime in the landscape.

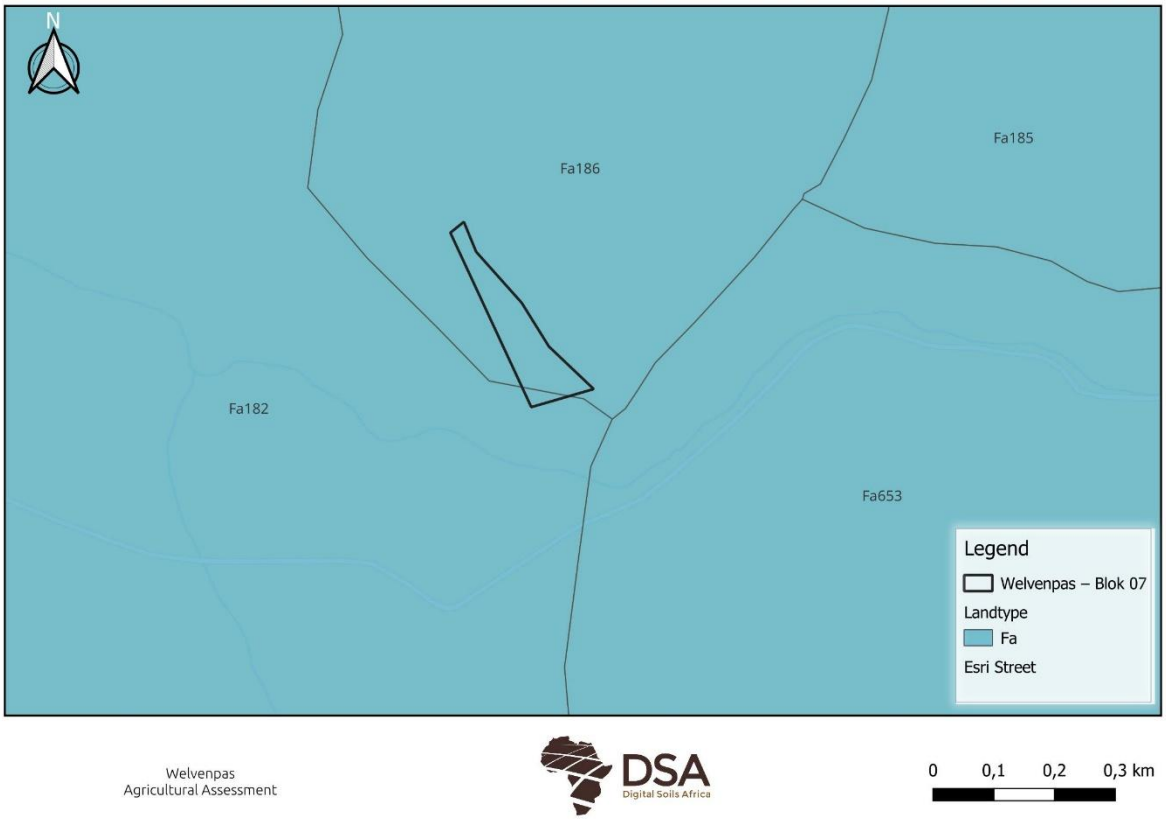


FIGURE 9: LANDTYPES FOUND IN THE STUDY AREA AND THE SURROUNDING AREA (LAND TYPE SURVEY STAFF, 1972 – 2002).

SOIL CAPABILITY

The Soil capability consists of 9 values, with 1 being the lowest value and 9 being the highest value. The main factors contributing to the Soil capability consist of:

- Plan available water (80%)
- Soil sensitivity (17%)
- Soil fertility (3%)

The soil capability of the study area, according to the DAFF (2017), has a range between 3 (Low) and 4 (Low – moderate) (Figure 10). Overall, the study area has a low to moderate soil capability.

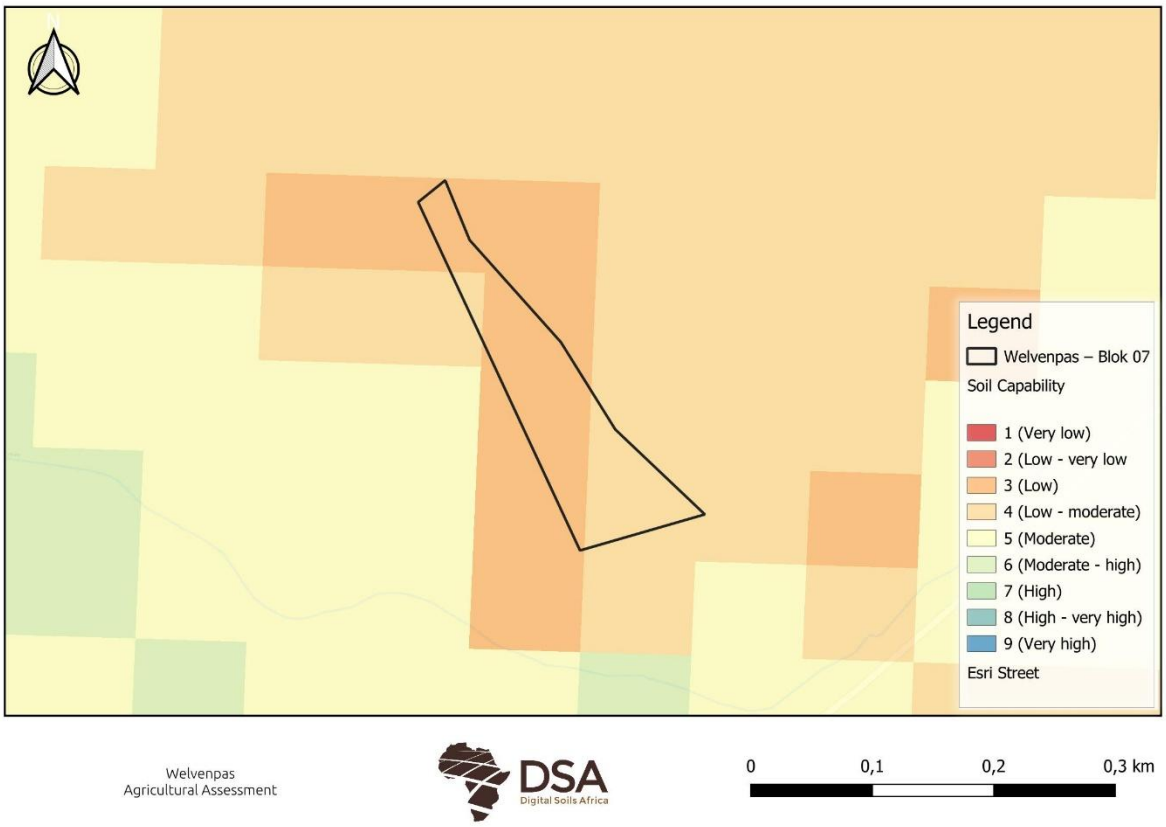


FIGURE 10: THE SOIL CAPABILITY OF THE SITE AND SURROUNDING AREA (DAFF, 2017).

TERRAIN CAPABILITY

Terrain plays an important role in a plants' physiological growth requirements, and from a sensitivity and accessibility perspective, Therefore, the two terrain modelling concerns included in the terrain capability modelling exercise were plant physiology and terrain sensitivity. The Terrain capability consists of 9 values, with 1 being the lowest value and 9 being the highest value.

The terrain capability of the proposed development area, according to the DAFF (2017), has values of 3 (Low), 4 (Low – moderate) and 6 (Moderate – high) (Figure 11). Overall, the study area has a low to high terrain capability.

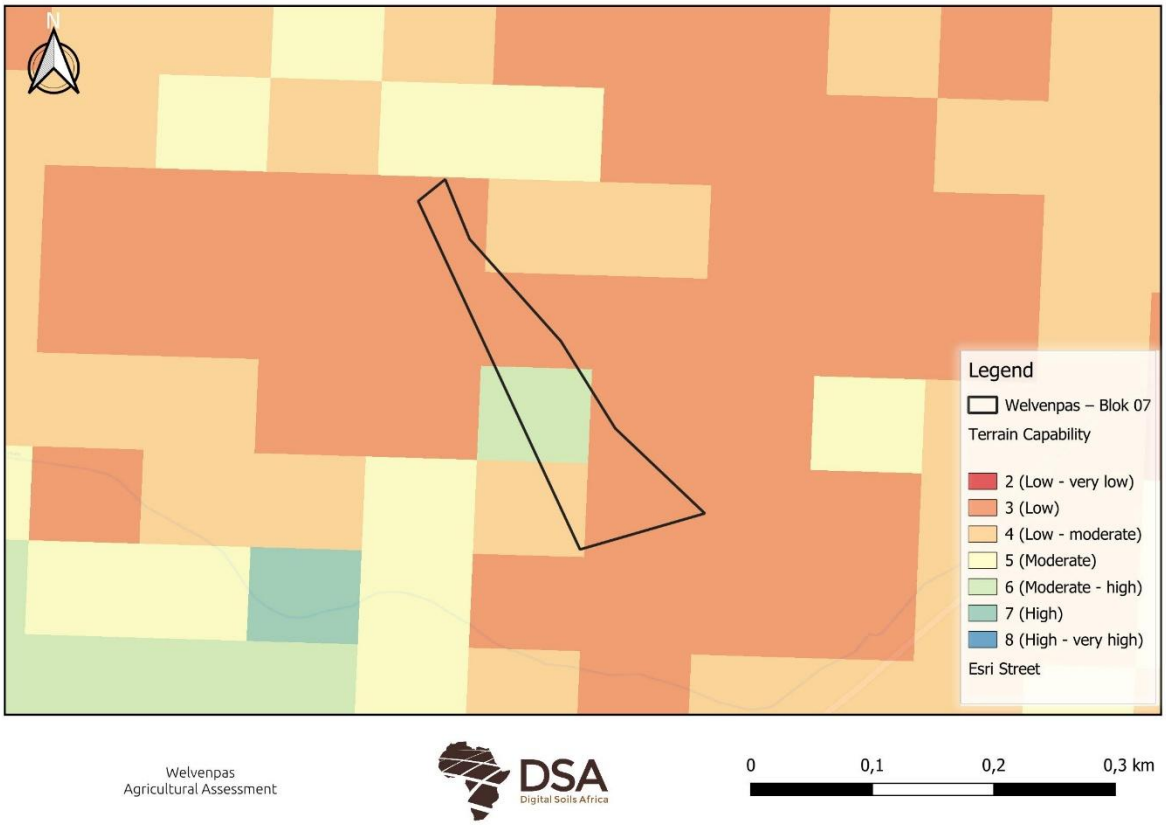


FIGURE 11: THE TERRAIN CAPABILITY OF THE SITE AND SURROUNDING AREA (DAFF, 2017).

LAND CAPABILITY

The new Land capability (Department of Agriculture, Forestry and Fisheries, 2017) has fifteen classes, as opposed to the eight classes described by Schoeman et al. (2002). The data is usable on a scale of 1:50 000 – 1: 100 000, therefore, not suitable for farm scale recommendations. Classes 1 to 7 are of low land capability and only suitable for wilderness or grazing. Classes 8 to 15 are considered to have arable land capability with the potential for high yields increasing with the land capability class number.

TABLE 2: LAND CAPABILITY CLASS AND THE DESCRIPTION OF THE CLASS

Land Capability Class	Description	
1-2	Very Low	Not arable
3-4	Very Low to Low	
5	Low	
6-7	Low to Moderate	
8	Moderate	Arable
9-10	Moderate to High	
11	High	
12-13	High to Very High	
14-15	Very High	

The Land capability values of the proposed development area are between 4 (Very low – low) and 7 (Low – moderate) (Figure 12). Overall, the Land capability of the proposed development area is very low to moderate, which is considered not arable.

FIGURE 12: LAND CAPABILITY CLASS MAP OF THE STUDY AREA (DAFF, 2017).

GRAZING CAPACITY

The unit used in the grazing capacity is hectares per large stock unit (ha/LSU). The study site has a very low grazing capacity 108 ha/LSU (Figure 13). A homogeneous unit of vegetation expressed as the area of land required (in hectares) to maintain a single animal unit (LSU) over an extended number of years without deterioration to vegetation or soil. Where an LSU = An animal with a mass of 450 kg and which gains 0.5 kg per day on forage with a digestible energy of 55%. (Trollope et. Al., 1990).

FIGURE 13: GRAZING CAPACITY FOR THE SITE AND THE SURROUNDING AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 2016).

LAND USE

South African National Land-Cover 2020 (SANLC 2020) (GeoTerraImage, 2020) was compared to the 2014 Land Cover to determine if there was a land use change since 2014, and there was very little conflicting classification in the study area. SANLC 2020 classifies the proposed development area as 33 (Cultivated Commercial Permanent Vines) and 40 (Cultivated Commercial Annuals Non-Pivot / Non-Irrigated) (Figure 14) with the classes described in the **Error! Reference source not found.** below.

TABLE 3: LEGEND TO FIGURE 14

No.	Class Name	Class Definition
33	Cultivated Commercial Permanent Vines	Active or recently active cultivated lands used for the production of agricultural crops, in this case specifically associated with commercial viticulture. The plants remain in-field for multiple growing seasons and harvests. Often irrigated.
40	Cultivated Commercial Annuals Non-Pivot / Non-Irrigated	Active or recently active cultivated lands used for the production of agricultural crops, in this case specifically associated with commercial annual crops, the plants only remain in the field for one growing season and one harvest, and are grown non-irrigated, rainfed fields.

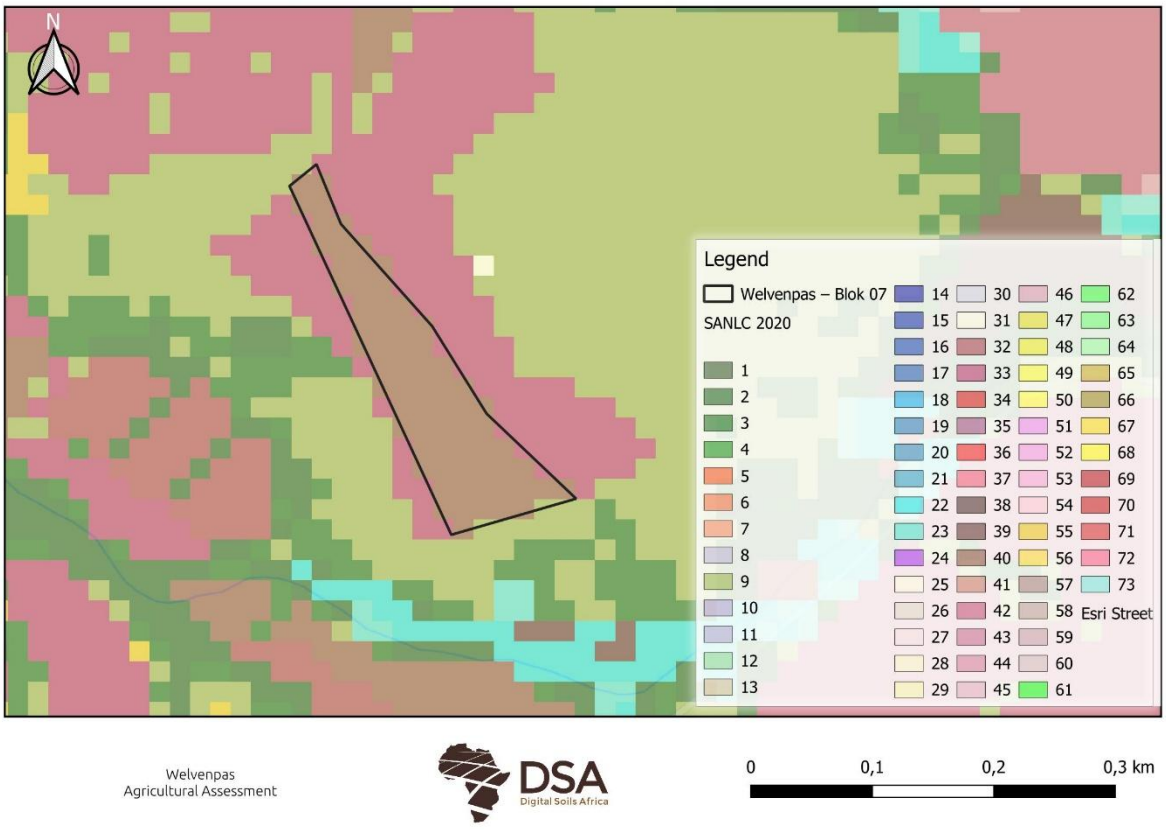


FIGURE 14: SOUTH AFRICAN NATIONAL LAND-COVER 2020 (SANLC 2020).

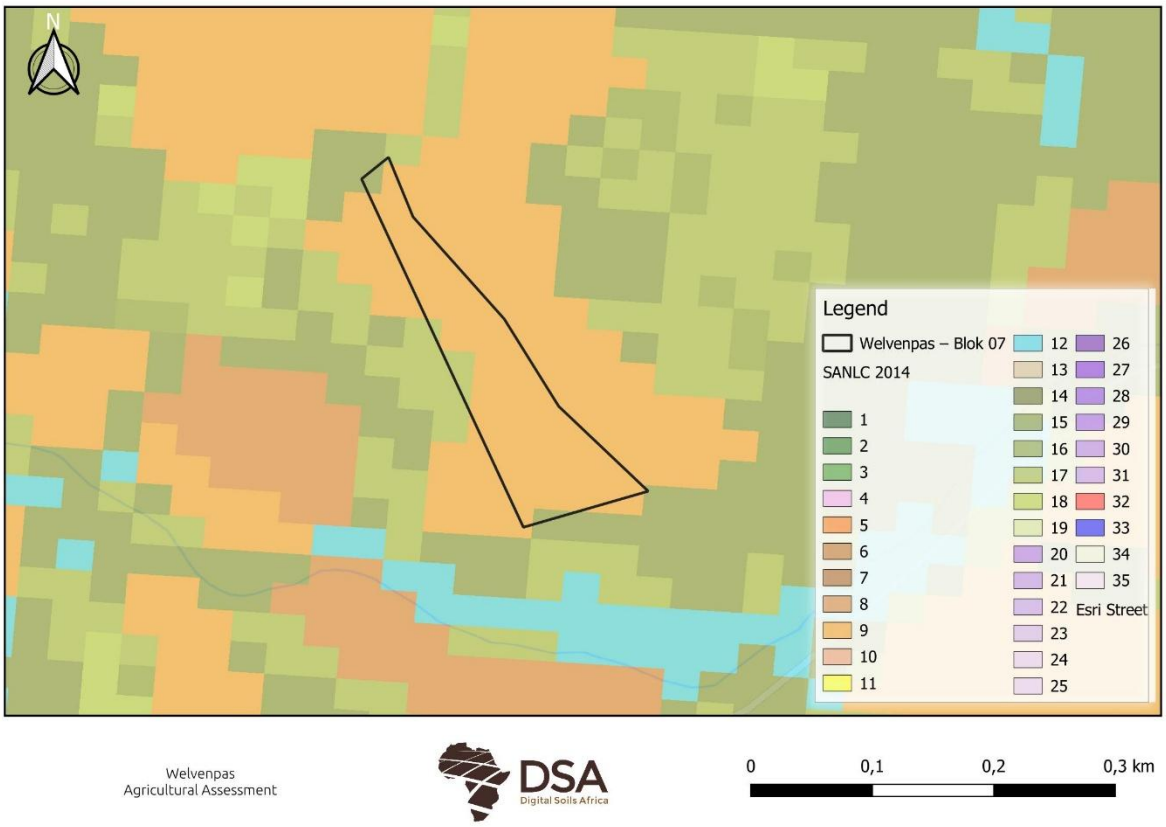


FIGURE 15: SOUTH AFRICAN NATIONAL LAND-COVER 2014 (SANLC 2014).

The Google satellite images suggest that the landuse surrounding the development site has not changed (2014 – 2025) (Figure 16 to Figure 19). The slow return back to natural vegatation is clearly visable from 2014 to 2025. Therefore, the lands have not been cultivated for some time.

FIGURE 16: GOOGLE SATELLITE IMAGE OF WELVENPAS FARM (2014).

FIGURE 17: GOOGLE SATELLITE IMAGE OF WELVENPAS FARM (2018).

FIGURE 18: GOOGLE SATELLITE IMAGE OF WELVENPAS FARM (2022).

FIGURE 19: GOOGLE SATELLITE IMAGE OF WELVENPAS FARM (2025).

The Cultivated Fields (2021) spatial layer available on Cape Farm Mapper classifies the study area as *Planted Pastures* (Western Cape Government, 2021). This classification is broadly aligned with the South African National Land Cover (SANLC) dataset; however, it is not consistent with a visual assessment of recent high-resolution imagery obtained from Google Earth.

FIGURE 20:THE LAND COVER ACCORDING TO CAPE FARM MAPPER.

CONCLUSION

In terms of Government Notice No. 320 of 2020, promulgated under the Subdivision of Agricultural Land Act (Act 70 of 1970), agricultural land located within a Protected Agricultural Area (PAA).

The subject property is situated within a designated PAA and therefore requires confirmation that the proposed activity does not result in the loss or downgrading of high agricultural potential land.

Findings from the desktop assessment for the study site:

- The development area is situated within a Protected Agricultural Area.
- Historical cultivated crop fields were mapped in SANLC 2014 and 2020.
- The site falls within a moderate to high climate capability zone (value = 6).
- The area is located within the Fa land type, associated with shallow soils.
- Soil capability from national datasets indicates Low (3) to Low to moderate (4) capability.
- Terrain capability is Low (3) to High (6) across most of the development area.
- Land capability from DAFF (2017) suggests Very low to low (LC 4) to Low to moderate (LC7) land capability.
- The grazing capacity is 108 ha/LSU.
- SANLC 2020 identifies the area as Cultivated Commercial Permanent Vines and Cultivated Commercial Annuals Non-Pivot / Non-Irrigated.
- Cape Farm Mapper classifies the area as rainfed pastures- which it was in the past.

The site therefore comprises historically transformed agricultural land that has previously been cultivated and/or utilised for planted pastures. No natural veld will be cleared.

The proposed development entails the planting of olives over an extent of 2.21 ha. The following is noted:

- The area has already been transformed through previous pasture establishment.
- No high-value, irrigated annual cropping land will be lost.
- The activity constitutes a continuation of agricultural use (perennial crop establishment) rather than a conversion to non-agricultural land use.
- The footprint is limited in extent (2.21 ha) and does not materially affect the agricultural resource base of the farm unit.

Olives are a perennial crop well suited to marginal to moderate land capability soils and typically require limited soil disturbance once established. The proposed activity will therefore not result in a downgrading of agricultural potential and may enhance long-term soil stability compared to unmanaged fallow land.

APPENDIX 1: SPECIALIST CV

DR DARREN BOUWER

EDUCATION

PhD Soil Science	University of the Free State	2018
M.Sc. Soil Science	University of the Free State	2013
B.Sc. Soil Science (Hon)	University of the Free State	2009
B.Sc. Soil Science	University of the Free State	2008
Matric certificate	Queens College	2005

PROFESSIONAL AFFILIATIONS

- SACNASP- Pri Nat Sci 400081/16
- Member of the Soil Science Society of South Africa
- Member of the Soil Classification Work Group
- Member of South African Soil Surveyors Organisation

WORK EXPERIENCE

- **Digital Soils Africa** / Soil Scientist - May 2012 – Present
- **Ghent University** / Researcher- January 2016 - December 2016
- **University of the Free State**/ Assistant Researcher- January 2011- December 2015

PUBLICATIONS

Total consultancy reports: >120 **Total Publications: 6**

Most relevant:

Bouwer, D., Le Roux, P. A., van Tol, J. J., & van Huyssteen, C. W. (2015). Using ancient and recent soil properties to design a conceptual hydrological response model. Geoderma, 241, 1–11.

Van Zijl, G. M., Bouwer, D., van Tol, J. J., & le Roux, P.A.L. (2014). Functional digital soil mapping: A case study from Namarroi, Mozambique. Geoderma, 219-220, 155–161.

SPECIALIST DECLARATION

I, Darren Bouwer, declare that –

- I act as the independent specialist in this application;
- I regard the information contained in this report to be true and correct;
- I do not have a conflict of interest in this project;
- I will conduct the work relating to the project in an objective manner.

Dr Darren Bouwer
PhD Soil Science
Pri Nat Sci 400081/16