



AGRICULTURAL
COMPLIANCE STATEMENT
THE PROPOSED
DEVELOPMENT OF AN
INSTREAM DAM ON
PORTIONS 2 AND 3 OF
FARM NO. 1100,
BONATHABA, MALMESBURY,
WESTERN CAPE

PREPARED FOR

ENVIROAFRICA

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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: 95

Total Publications: 5

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 Bower, 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 Bower
PhD Soil Science
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BACKGROUND TO THE STUDY

Digital Soils Africa (Pty) LTD (DSA) were tasked by EnviroAfrica to undertake an Agricultural Compliance Statement 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. The Compliance Statement is reported according to the protocol for the specialist assessment and minimum report content requirements for the environmental impacts on agricultural resources (DEA, 2020).

The Bonathaba Farm, as well as Zwartfontein Farm (located adjacent to Bonathaba), form part of a development plan to approximately double the productive hectares of the farm’s agricultural output. This development plan aims to create a large-scale, sustainable citrus and grape operation, creating over 200 new employment opportunities while retaining over 600 jobs.

The proposed dam will have a gross storage capacity of one million cubic meters (1 000 000m³) with a development footprint of approximately 19.2ha. The proposed dam will overlap both properties where the dam wall will be located on the eastern boundary of the two properties

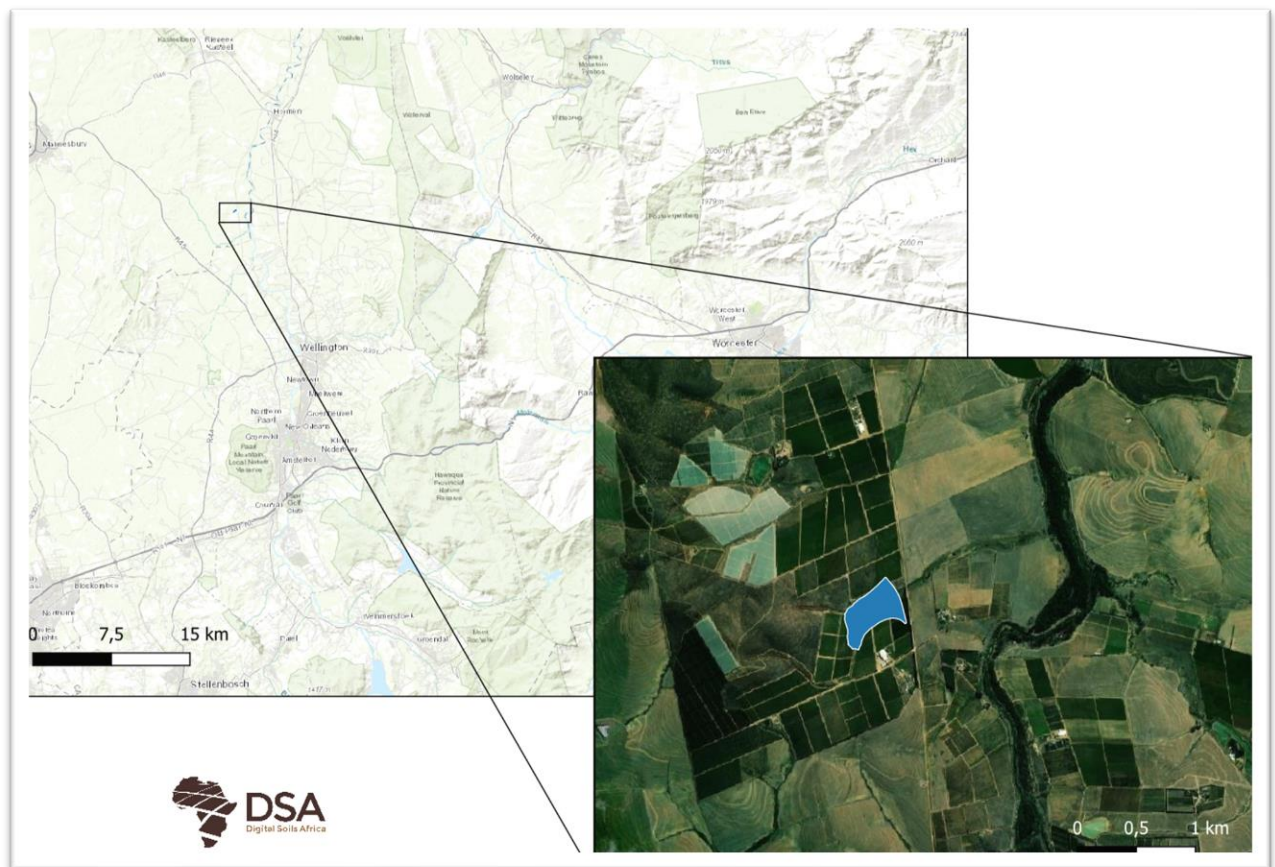


FIGURE 1: LOCATION OF THE STUDY AREA IN THE WESTERN CAPE PROVINCE.

SCREENING TOOL

From the ESR, the area is dominated by Very high Agricultural sensitivity around the Dam, due to the viticulture, but the land capability is low and moderate.

The proposed development is required to ensure the long-term viability and sustainability of table grapes and citrus through a reliable water supply, hence the Western Cape Department of Environmental Affairs and Development Planning granting the applicant permission to conduct a compliance statement.

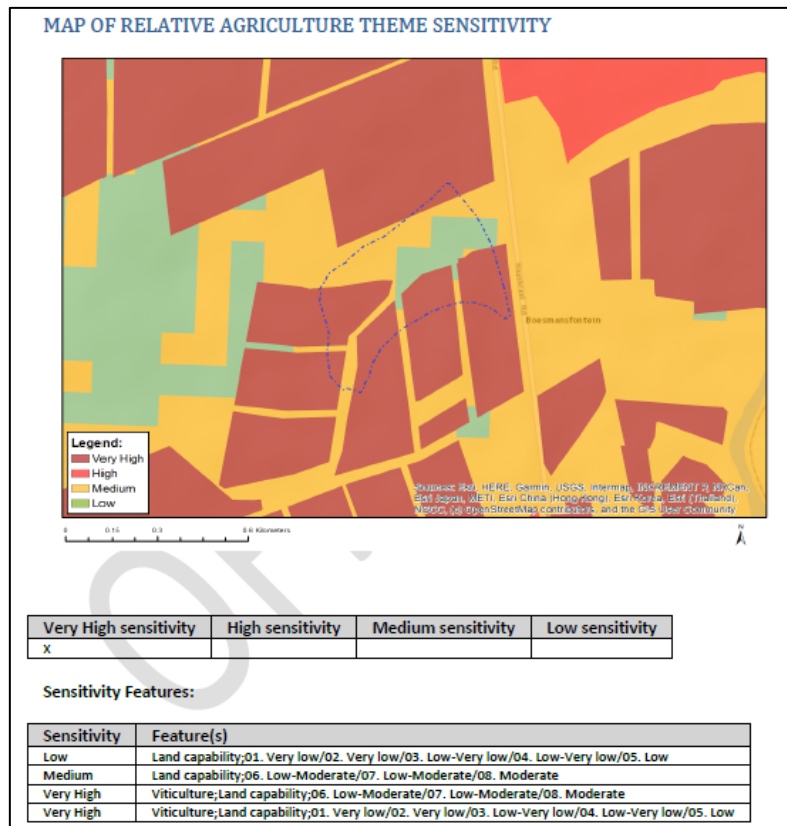


FIGURE 2: RESULTS FROM THE DEA SCREENING TOOL.

METHODOLOGICAL APPROACH

DESKTOP SURVEY

All information used to compile the Compliance Statement.

TABLE 1: LIST OF DATA USED TO COMPILE COMPLIANCE STATEMENT

| | |
|---|--|
| Climate | Schulze (2007) |
| South African Nation Land Cover 2018 | Department of Environmental Sciences (2018) |
| Long Term Grazing Capacity Map for South Africa | Department of Agriculture, Forestry and Fisheries (2016) |
| Climate | Schulze (2007) |

RESULTS

DESKTOP

LAND TYPE INFORMATION

There is only one land type occurring in the study area, namely Fb94 (Figure 3) (Appendix 1). Fb94 is dominated by shallow Mispah and Glenrosa soils (52%) and pedocutanic horizon containing soils (31%). Most of the soils are shallower than 300 mm (52.8%). The criteria for an area to qualify for inclusion in the landtypes are given in Table 2.

TABLE 2: BRIEF DESCRIPTION OF BROAD LANDTYPES FOUND IN THE STUDY AREA.

| Landtype | Description |
|----------|---|
| Fb | Shallow soils (Mispah & Glenrosa forms) predominate; usually lime in some of the bottomlands in landscape |



FIGURE 3: LAND TYPES OCCURRING IN THE STUDY AREA (LAND TYPE SURVEY STAFF, 1972 – 2002).

CLIMATE

The mean annual rainfall distribution is between 400 and 600 mm and the site falls within the semi-arid climate.

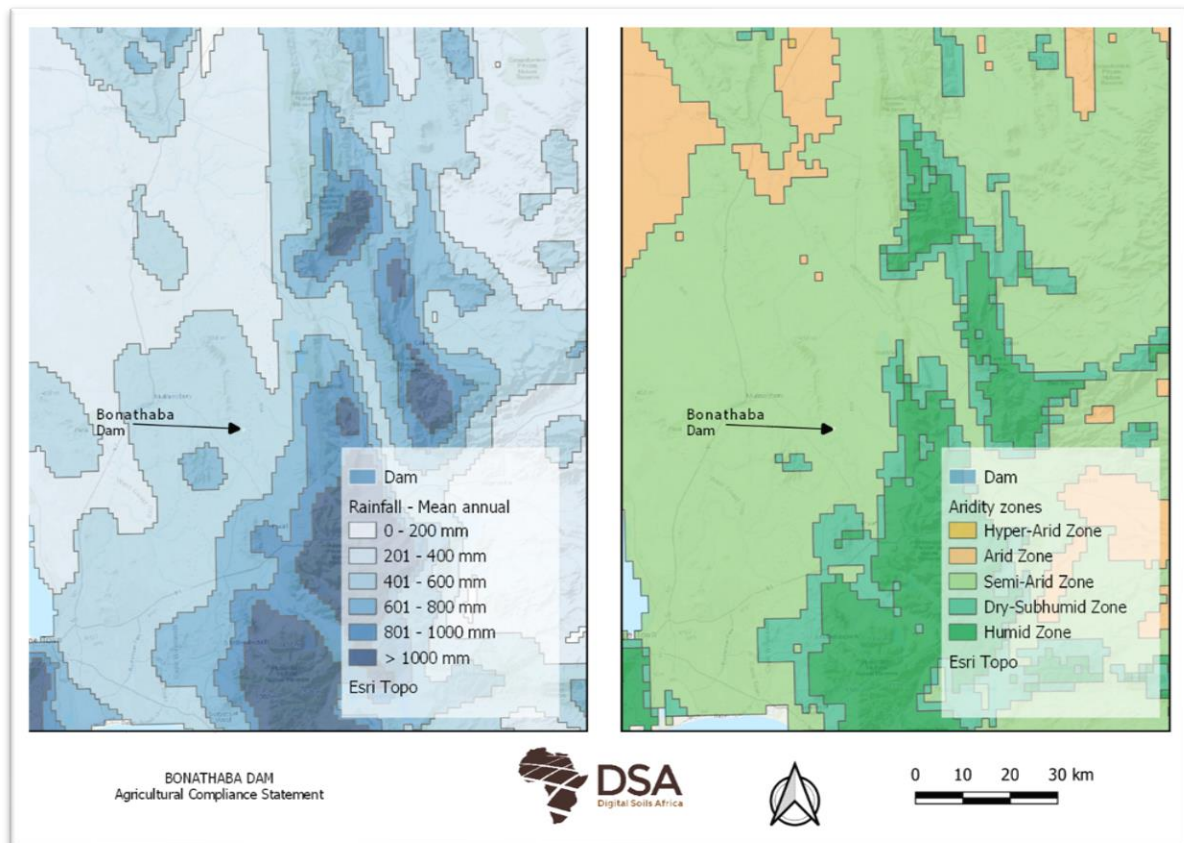


FIGURE 4: RAINFALL DISTRIBUTION AND ARIDITY ZONES OF THE SITE AND SURROUNDING AREA (SCHULZE, 2007).

LAND USE

The current land use is dominated by Open cast mining and mining infrastructure (Figure 5). The access road does intersect natural grasses.

TABLE 3: SELECTED NATIONAL LAND-COVER LEGEND AND CLASS DEFINITIONS USED IN THE SOUTH AFRICAN LAND-COVER 2018

| No. | Class Name | Class Definition |
|-----|---------------------------------------|---|
| 9 | Low Shrubland (Fynbos) | This is the same as class 8, Low Shrubland, but now represents low, indigenous karoo-type vegetation communities, which have been identified using image-based spectral models, but which fall spatially inside the SANBI defined boundaries for Fynbos vegetation communities. |
| 23 | Herbaceous Wetlands | Natural or semi-natural wetlands covered in permanent or seasonal herbaceous vegetation. The mapped wetland extent represents the surface wetland extent detectable from image detectable surface vegetation characteristics, (which may differ from soil-profile based wetland delineations). This wetland class represents wetlands identified in the current national land-cover modelling. The class represents primarily riparian wetland areas, but can also include emergent aquatic vegetation in pans. |
| 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. |
| 46 | Fallow Land & Old Fields (Low Shrub) | Long-term, non-active, previously cultivated lands that are now overgrown with tree-dominated low shrub vegetation. Typically the cultivated land unit is no longer image detectable. Historical field boundaries (supplied by SANBI) have been mapped from archival topographical 1:50,000 maps circa 1950's-70's. This class is only represented if it has not been modified to a more recent, alternative land-cover or land-use class. |

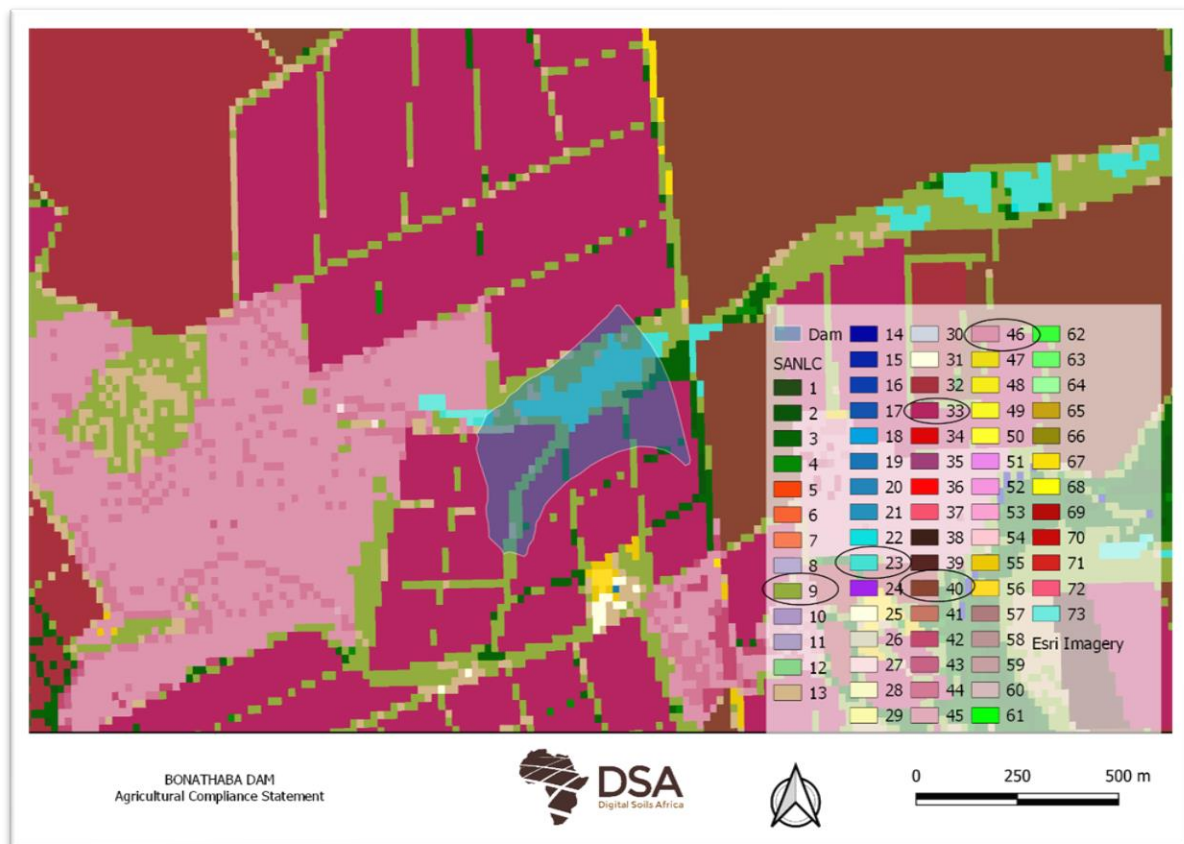


FIGURE 5: SOUTH AFRICAN NATIONAL LAND-COVER 2018 (SANLC, 2018). *LANDUSES IN THE PROJECT AREA HIGHLIGHTED IN THE LEGEND.

The existing existing crops (which will be cleared) present within the proposed development footprint:

- ~ 3ha lemons, planted in 1994: The lemons are reaching the end of the profitability in terms of tree age, production, and quality of fruit;
- ~ 2.2ha Tawny grapes, planted 2014 and ~ 2.5ha Magenta planted 2016: The Tawny and Magenta cultivars are currently under a lot of pressure from international markets. This is attributed to the characteristics of this specific cultivar due to unacceptable quality, condition, and shelf life. Thus, these plants would need to be uprooted due to very low income; and
- ~ 1.5ha Sugra 19 planted in 2012 and ~ 1.2ha Crimson planted in 2008: The Crimson and Sugra 19 field produce consistently low yields and are therefore not economically viable to continue with.
- Alternative areas on the farm can also be utilized for new plantings of the 10.4ha. Approximately 6ha have already been newly planted with lemons. Only 4.4ha will be needed

to replace the total area of the fields lost. This would be covered in the yearly long term replanting strategy for the farm that consists of between 5% to 10 % of the farms planted area.

GRAZING CAPACITY

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).

The unit used in the grazing capacity is hectares per large stock unit (ha/LSU), therefore the site falls in a low grazing capacity of 36 ha/LSU (Figure 6). Most of the site is cultivated and not used as grazing (Figure 5).

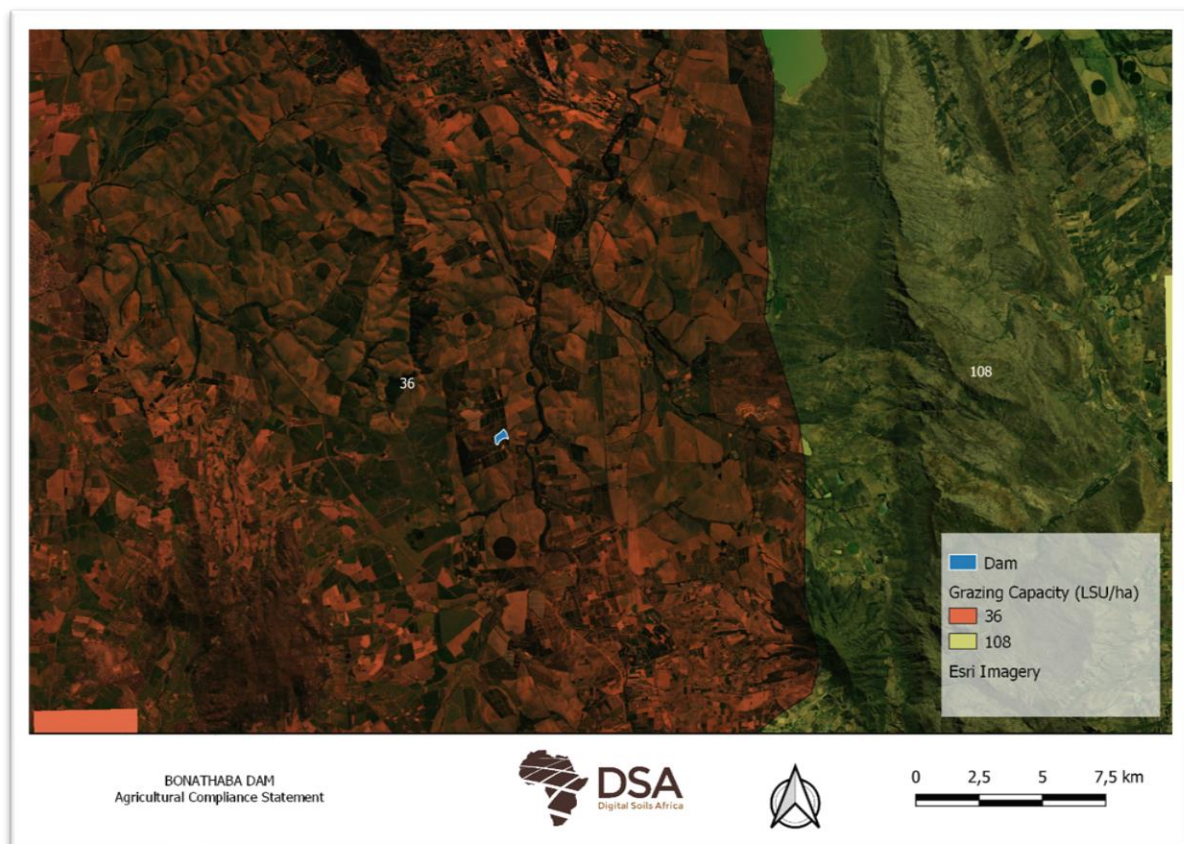


FIGURE 6: GRAZING CAPACITY OF THE SITE AND SURROUNDING AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 2016).

COMPLIANCE STATEMENT

The desktop study confirmed that the proposed development site is of a low and moderate land capability but classified as high Agricultural sensitivity due to citrus and grape production on these soils.

The landtypes of the area predict shallow or clayey soils. These soils will have a low water holding capacity which will limit crop production in the semi-arid climate. Therefore, access to irrigation will ensure the long-term economic viability and sustainability through a reliable water supply. Considering the climate change forecasts of unpredictable weather patterns in this area, a constant water supply could be invaluable.

The grazing potential of 36 ha/LSU is low, although most the area is cultivated and limited area suitable for grazing.

It is the specialist's opinion that although the proposed development is occurring on high agricultural sensitivity, the relatively small loss in agricultural production is a small offset for the security of water supply. In terms of agricultural security, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided.

Recommendations during construction of the dam:

1. Restrict the proposed development to the smallest footprint possible and do not disturb/alter areas outside the development.
2. Ensure that access roads are kept clear, and that construction and operational activities do not interfere with agricultural activities.
3. Fencing is maintained to avoid animals onto the site.

REFERENCE

- Department of Agriculture, Forestry and Fisheries, 2016. 2016 Grazing Capacity map of South Africa. Pretoria
- Department of Environmental Sciences, 2018. South African National Land-Cover 2018; Department of Environmental Affairs, Pretoria, South Africa.
- Land Type Survey Staff. 1972 – 2002. Land types of South Africa: Digital map (1:250 000 scale) and soil inventory datasets. ARC-Institute for Soil, Climate and Water, Pretoria.
- Schulze, R.E. 2007. South African Atlas of Climatology and Agrohydrology. Water Research Commission, Pretoria, RSA, WRC Report 1489/1/06.
- W.S.W. Trollope, Lynne A. Trollope & O.J.H. Bosch (1990) Veld and pasture management terminology in southern Africa, Journal of the Grassland Society of Southern Africa, 7:1, 52-61

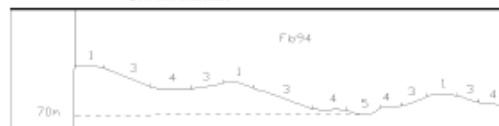
APPENDIX 1: LANDTYPE

| | | | | | | |
|---|----------|------------|------------|----------|---|--|
| LAND TYPE / LANDTIPE | Fb94 | | | | Occurrence (maps) and areas / Voorkoms (kaarte) en oppervlakte : | Inventory by / Inventaris deur : |
| CLIMATE ZONE / KLIMAATSONE | 2635W | | | | 3318 Cape Town (7013 ha) | B Stehr & F Ellis |
| Area / Oppervlakte | 7013 ha | | | | | Modal Profiles / Modale profile : |
| Estimated area unavailable for agriculture | | | | | | None / Geen |
| <i>Beraamde oppervlakte onbesikbaar vir landbou :</i> | 130 ha | | | | | |
| Terrain unit / Terreineenheid | 1 | 3 | 4 | 5 | | |
| % of land type /% van landtipe | 30 | 45 | 15 | 10 | | |
| Area / Oppervlakte (ha) | 2104 | 3156 | 1052 | 701 | | |
| Slope / Helling (%) | 2 - 4 | 4 - 15 | 1 - 3 | 1 - 3 | | |
| Slope length / Hellinglengte (m) | 50 - 300 | 300 - 1500 | 300 - 1500 | 20 - 300 | | |
| Slope shape / Hellingvorm | Y | Y | X-Z | X | | |
| MB0, MB1 (ha) | 421 | 1357 | 789 | 617 | | Depth limiting material |
| MB2 - MB4 (ha) | 1683 | 1799 | 263 | 84 | | |

| Soil series or land classes | Depth | | | | | Total | Clay content % | | | | Texture | Diepte-bepoerende materiaal |
|------------------------------------|---------------|------|---------|---------|--------|---------------|-----------------------|---|-----|----------|-----------------|------------------------------------|
| <i>Grondseries of landklasse</i> | <i>Diepte</i> | | | | | <i>Totaal</i> | <i>Klei-inhoud %</i> | | | | <i>Tekstuur</i> | |
| | (mm) | MB : | ha % | ha % | ha % | ha % | A | E | B21 | Hor | Class / Klas | |
| <i>Soil-rock complex</i> | : | | | | | | | | | | | |
| <i>Grond-rotskompleks</i> | : | | | | | | | | | | | |
| Rock/Rots | 4 : | | 42 2 | | | 42 0.6 | | | | | | |
| Mispah Ms10 | 100-300 3 : | | 421 20 | 473 15 | 53 5 | 947 13.5 | 15-30 | | | A | fiSaLm-SaCILm | R |
| Kanonkop Gs13, Williamson Gs16 | 100-300 3 : | | 1220 58 | 1326 42 | 210 20 | 2756 39.3 | 10-25 | | | 20-30 A | fiSaLm-SaCILm | so,R |
| Swardland Sw31, Hogsback Sw32 | 500-700 0 : | | 421 20 | 631 20 | 421 40 | 1473 21.0 | 20-30 | | | 35-55+ B | SiCILm-CI | vp |
| Stanford Ss23, | : | | | | | | | | | | | |
| Grootfontein Ss25 | 300-600 0 : | | | | 368 35 | 403 5.8 | 6-15 | | | 25-35 A | fi/coSa-SaLm | pr |
| Skildekran Sw11, | : | | | | | | | | | | | |
| Breidback Sw12 | 600-900 0 : | | | 379 12 | | 379 5.4 | 20-30 | | | 35-55+ B | SiCILm-CI | vr |
| Leeufontein Oa16, Jozini Oa36 | 900-1200 0 : | | | | | 336 4.8 | 10-20 | | | 15-30 B | meSaLm-SaCILm | R,sa |
| Sunnyvale Va10, Waterval Va11 | 500-800 0 : | | | 189 6 | | 189 2.7 | 15-25 | | | 30-55 B | fiSaCILm-CI | vr |
| Herschel Va30, Valurivier Va40 | 500-700 0 : | | | | | 175 2.5 | 10-20 | | | 15-30 B | fiSaLm-SaCILm | vp |
| Springfield Cv24 | 900-1200+ 0 : | | | 158 5 | | 158 2.3 | 6-15 | | | 6-15 B | meSa-SaLm | so,R |
| Dundee Du10 | 900-1200+ 0 : | | | | | 70 1.0 | 10-20 | | | A | fi/meSaLm | so |
| Stream beds/Stroombeddings | 4 : | | | | | 84 1.2 | | | | | | |

Terrain type / Terreintipe : B2

Terrain form sketch / Terreinvormskets



For an explanation of this table consult LAND TYPE INVENTORY (table of content)

Ter verduideliking van hierdie tabel lyk LANDTIPE - INVENTARIS (inhoudopgawe)

Geology: Mainly greywacke, phyllite, quartz schist and phyllite shale of the Moorsburg, Klipplaat and Porterville Formations, Malmesbury Group; occasional alluvium.

Geologie: Hoofsaaklik gronwag, filliet, kwartskies en fillietkalis van die Moorsburg, Klipplaat en Porterville Formasies, Malmesbury Groep; plek-plek alluvium.