

Appendix D *Specialist Studies*



 **LEGACY** | ENVIRONMENTAL
MANAGEMENT
CONSULTING



D1.1: Agricultural Compliance Statement

Johann Lanz

Soil Scientist (Pr.Sci.Nat.)

Reg. no. 400268/12

Cell: 082 927 9018

e-mail: johann@johannlanz.co.za

1A Wolfe Street

Wynberg

7800

Cape Town

South Africa

**SITE SENSITIVITY VERIFICATION
AND
AGRICULTURAL COMPLIANCE STATEMENT
FOR THE CARPE DIEM SOLAR ENERGY FACILITY
NEAR CARLETONVILLE IN GAUTENG PROVINCE**

**Report by
Johann Lanz**

9 July 2023

Table of Contents

Executive summary	1
1 Introduction	3
2 Project description	4
3 Terms of reference	4
4 Methodology of study	5
5 Assumptions, uncertainties or gaps in knowledge or data	7
6 Applicable legislation and permit requirements.....	7
7 Site sensitivity verification	7
8 Baseline description of the agro-ecosystem	9
8.1 Assessment of the agricultural production potential.....	13
9 Assessment of the agricultural impact.....	13
9.1 Impact identification and assessment	13
9.2 Cumulative impact assessment	14
9.3 Mitigation measures	15
9.4 Compliance with the allowable development limits	16
10 Conclusion: Agricultural Compliance Statement	16
11 References.....	18
Appendix 1: Specialist Curriculum Vitae	19
Appendix 2: Details of the specialist, declaration of interest and undertaking under oath...	20
Appendix 3: SACNASP Registration Certificate	22
Appendix 4: Projects included in cumulative impact assessment	23
Appendix 5: Soil data	24

EXECUTIVE SUMMARY

South Africa needs agricultural production for food security. It also urgently needs renewable energy development. In order to achieve its renewable energy generation goals, agriculturally zoned land will inevitably need to be used for renewable energy generation.

The screening tool rating of the agricultural sensitivity of the assessment area is mostly medium. but it includes some areas of high sensitivity. This assessment disputes the classified land capability, based on the assessment of the cropping potential of the site in this report. It verifies the land capability as a maximum of 7 (unsuitable for cropping). This assessment therefore disputes the high sensitivity rating by the screening tool and verifies the entire assessment area as being of medium agricultural sensitivity.

The cropping potential of the site is limited predominantly by the shallow soils. The site is not suitable for rain-fed crop production. The limited agricultural potential of the site limits its agricultural use to grazing only.

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of the development. The significance of an agricultural impact is a direct function of the following three factors:

1. the size of the footprint of land from which agriculture will be excluded (or the footprint that will have its potential decreased)
2. the baseline production potential (particularly cropping potential) of that land
3. the length of time for which agriculture will be excluded (or for which potential will be decreased).

In this case, the total footprint of land that will be lost, which will be lost for the life time of the development, is approximately 388 hectares. The production potential of that land is limited to only being suitable as grazing land. The loss of grazing land, of which there is no particular scarcity in the country, represents a minimal loss of agricultural production potential in terms of national food security and for the affected farm. Due to the fact that no viable cropland is lost as a result of this development, its negative agricultural impact is therefore assessed as being of low significance and as acceptable.

Its acceptability is substantiated by the following points:

- The amount of agricultural land use by the development is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national

need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.

- The proposed development poses a low risk in terms of causing soil degradation because degradation can be effectively prevented by standard, generic, best practice mitigation actions that are inherent in the project engineering.
- The proposed development offers a positive impact on agriculture by way of improved financial security for farming operations.
- The PV panels will not necessarily totally exclude agricultural production. The area can still be used to graze sheep that will, in addition, be protected against stock theft within the security area of the facility.
- The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy.
- In addition, the proposed development will contribute to the country's urgent need for energy generation, particularly renewable energy that has much lower environmental and agricultural impact than existing, coal powered energy generation.
- All renewable energy development in South Africa decreases the need for coal power and thereby contributes to reducing the large agricultural impact that open cast coal mining has on highly productive agricultural land throughout the coal mining areas of the country.

From an agricultural impact point of view, it is recommended that the proposed development be approved.

1 INTRODUCTION

Environmental and change of land use authorisation is being sought for the Carpe Diem Solar Facility near Carletonville in Gauteng Province (see location in Figure 1). In terms of the National Environmental Management Act (Act No 107 of 1998 - NEMA), an application for environmental authorisation requires an agricultural assessment. In this case, based on the verified medium agricultural sensitivity of the site (see Section 7), the level of agricultural assessment required is an Agricultural Compliance Statement.

Johann Lanz was appointed as an independent agricultural specialist to conduct this agricultural assessment. The objective of an agricultural assessment is to assess whether the agricultural impact of the proposed development will be acceptable, and based on this, to make a recommendation on whether it should be approved.

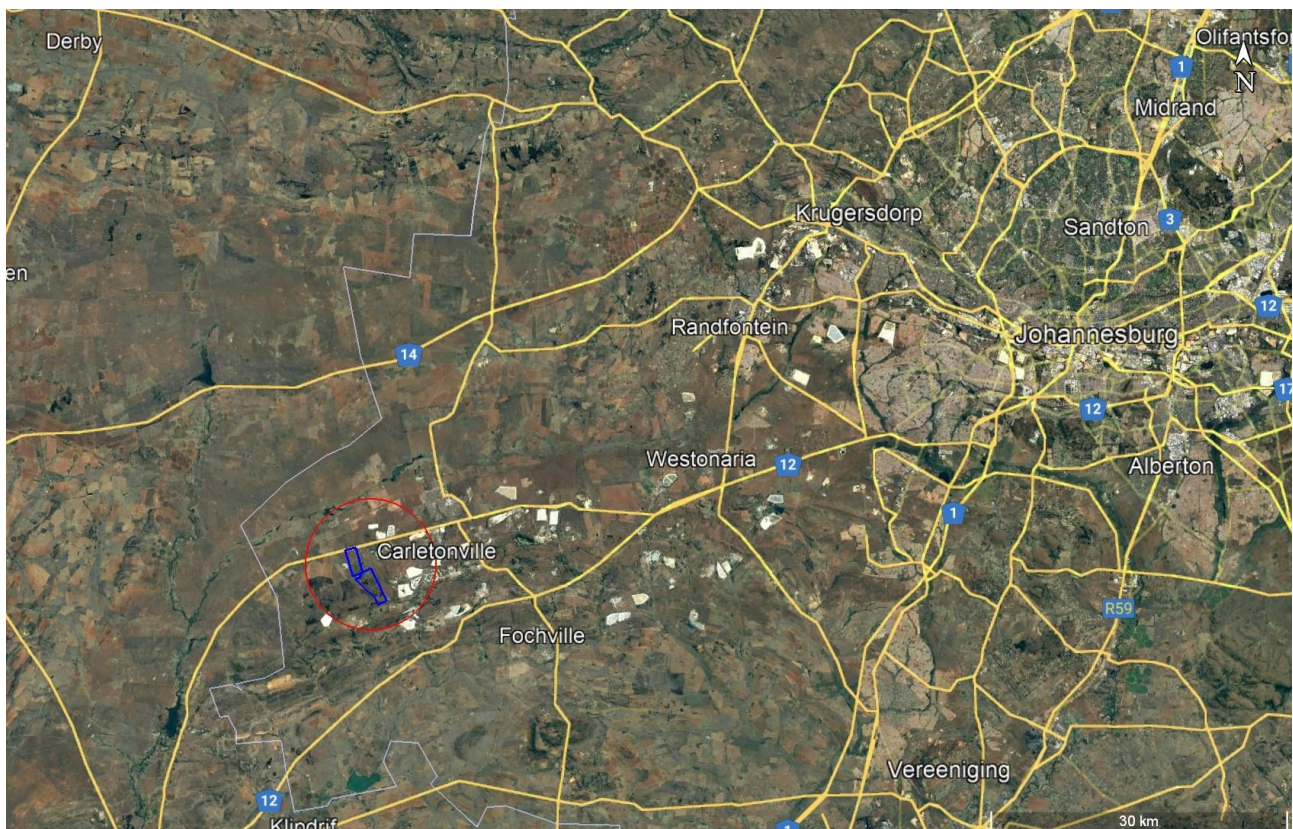


Figure 1. Locality map of the facility (dark blue outline within red circle) west of the town of Carletonville.

The purpose of the agricultural component in the environmental assessment process is to preserve agricultural production potential by ensuring that development does not unnecessarily exclude existing or potential agricultural production from land, or unnecessarily impact agricultural land to the extent that its production potential is reduced. The primary concern is the preservation of the agricultural production potential of scarce, arable land. The focus of an agricultural assessment

must therefore be to determine whether the proposed development will result in a significant loss of land that has economically viable future cropping potential (for more details see Section 9). This project poses minimal threat to agricultural production potential because of the lack of cropping potential of the impacted land.

2 PROJECT DESCRIPTION

The proposed facility will consist of the standard infrastructure of a PV energy facility including PV arrays; inverters; cabling; battery energy storage system; auxiliary buildings; access and internal roads; on-site substation; temporary construction laydown areas; and perimeter fencing. It will have a total generating capacity of up to 200 MW.

The exact nature and layout of the different infrastructure within the boundary fence of a solar energy facility has absolutely no bearing on the significance of agricultural impacts. It is therefore not necessary to detail this design and layout of the facility any further in this assessment. All that is of relevance is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land, referred to as the agricultural footprint. This is the area within the facility fence. Whether that footprint comprises, for example, a solar array, a road or a BESS is irrelevant to agricultural impact. The total agricultural footprint of the facility will be approximately 388 ha.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The terms of reference for an Agricultural Compliance Statement, as stipulated in the agricultural protocol, are listed below, and the section number of this report which fulfils each stipulation is given after it in brackets.

1. The Agricultural Compliance Statement must be prepared by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP) (**Appendix 3**).
2. The compliance statement must:
 1. be applicable to the preferred site and proposed development footprint (**Figures 2 and 3**);
 2. confirm that the site is of “low” or “medium” sensitivity for agriculture (**Section 7**); and
 3. indicate whether or not the proposed development will have an unacceptable impact

on the agricultural production capability of the site **(Section 10)**.

3. The Agricultural Compliance Statement must contain, as a minimum, the following information:
 1. details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae **(Appendix 1)**;
 2. a signed statement of independence by the specialist **(Appendix 2)**;
 3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool **(Figure 2)**;
 4. calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development including supporting infrastructure **(Section 9.4)**;
 5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol **(Section 9.4)**;
 6. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities **(not applicable)**;
 7. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development **(Section 10)**;
 8. any conditions to which this statement is subjected **(Section 10)**;
 9. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase **(not applicable)**;
 10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMP_r **(Section 9.3)**; and
 11. a description of the assumptions made and any uncertainties or gaps in knowledge or data **(Section 5)**.

4 METHODOLOGY OF STUDY

The assessment was based on an on-site investigation of the soils and agricultural conditions and was also informed by existing soil and agricultural potential data for the site. The aim of the on-site assessment was to:

1. ground-truth cropland status and consequent agricultural sensitivity;
2. assess the soil potential across the development footprint;
3. gain an understanding of overall agricultural production potential across the site.

This was achieved by a drive and walk-over investigation across the site. The site investigation was conducted on 27 October 2022. An interview was also conducted with the farmer for information on farming practices on the site. Soils were assessed based on the investigation of existing soil exposures in combination with indications of the surface conditions and topography, and strategically positioned auger samples where necessary. Soils were classified according to the South African soil classification system (Soil Classification Working Group, 1991).

An assessment of soils and long-term agricultural potential is in no way affected by the season in which the assessment is made, and therefore the fact that the assessment was done in summer has no bearing on its results.

The following sources of existing data were also used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries (DAFF). This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the DAFF, Pretoria.
- The spatial demarcation of Protected Agricultural Areas was obtained from the National Department of Agriculture, Land Reform and Rural Development (DALRRD).
- Field crop boundaries were sourced from Crop Estimates Consortium, 2019. Field Crop Boundary data layer, 2019. Pretoria. Department of Agriculture, Forestry and Fisheries.
- Rainfall and evaporation data was sourced from the SA Atlas of Climatology and Agrohydrology (2009, R.E. Schulze) available on Cape Farm Mapper. Note that Cape Farm Mapper includes national coverage of climate, grazing and certain other data.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Current and historical satellite imagery of the site and surrounds was sourced from Google Earth.

This level of agricultural assessment is considered entirely adequate for an understanding of on-site agricultural production potential for the purposes of this assessment.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

There are no specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

The development requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) because it is on agriculturally zoned land. There are two approvals that apply. The first is a No Objection Letter for the change in land use. This letter is one of the requirements for receiving municipal rezoning. This application requires a motivation backed by good evidence that the development is acceptable in terms of its impact on the agricultural production potential of the development site. This agricultural assessment report will serve that purpose.

The second approval is a consent for long-term lease required in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA). SALA approval is not required if the lease is over the entire farm portion. If DALRRD approval for the development has already been obtained in the form of the No Objection letter, then SALA approval is likely to be readily forthcoming. SALA approval can only be applied for once the Municipal Rezoning Certificate and Environmental Authorisation has been obtained.

7 SITE SENSITIVITY VERIFICATION

A specialist agricultural assessment is required to verify the agricultural sensitivity of the site as per the sensitivity categories used by the web-based environmental screening tool. Agricultural sensitivity is a direct function of the capability of the land for agricultural production, based only on its climate, terrain and soil capabilities. The different categories of agricultural sensitivity indicate the priority by which land should be conserved as agricultural production land. The agricultural sensitivity of the site, as given by the screening tool, is shown in Figure 2. The screening tool classifies agricultural sensitivity according to only two independent criteria, both of which are indicators of the land's agricultural production potential:

1. whether the land is classified as cropland or not, and
2. its land capability rating

All viable cropland is by definition either high or very high sensitivity. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain-fed agricultural production. It is rated by the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. The higher land capability values (≥ 8 to 15) are likely to be

suitable as arable land for crop production, while lower values (<8) are only likely to be suitable as non-arable grazing land. The direct relationship between land capability rating and agricultural sensitivity is shown in Table 1.

Table 1. Relationship between land capability and agricultural sensitivity as given by the screening tool.

Land capability value	Agricultural sensitivity
1 - 5	low
6 - 8	medium
9 - 10	high
11 - 15	very high

Because the land capability data is generated by GIS modelling and because it is applicable at a fairly small scale (1:50 000 to 1:100 000) it is not necessarily accurate for a specific site and therefore needs verification. The relationship between land capability and agricultural production potential is that a land capability rating of >8 should denote land that is suitable for viable rain-fed crop production and a rating equal to 8 is somewhat marginal. If land is unsuitable for viable rain-fed crop production then its verified land capability rating should be less than 8. Because crop boundaries change over time, they also need verification.

The screening tool rating of the agricultural sensitivity of the assessment area is mostly medium. but it includes patches (pixels) of high sensitivity. These are high sensitivity because they are rated with a land capability rating of 9 and 10. This assessment disputes the rated land capability, based on the assessment of the cropping potential of the site in this report (see Section 8) and verifies the land capability as a maximum of 7 (unsuitable for cropping). This assessment confirms that the site is outside of field crop boundaries. This assessment therefore disputes the high sensitivity rating by the screening tool and verifies the entire assessment area as being of medium agricultural sensitivity.

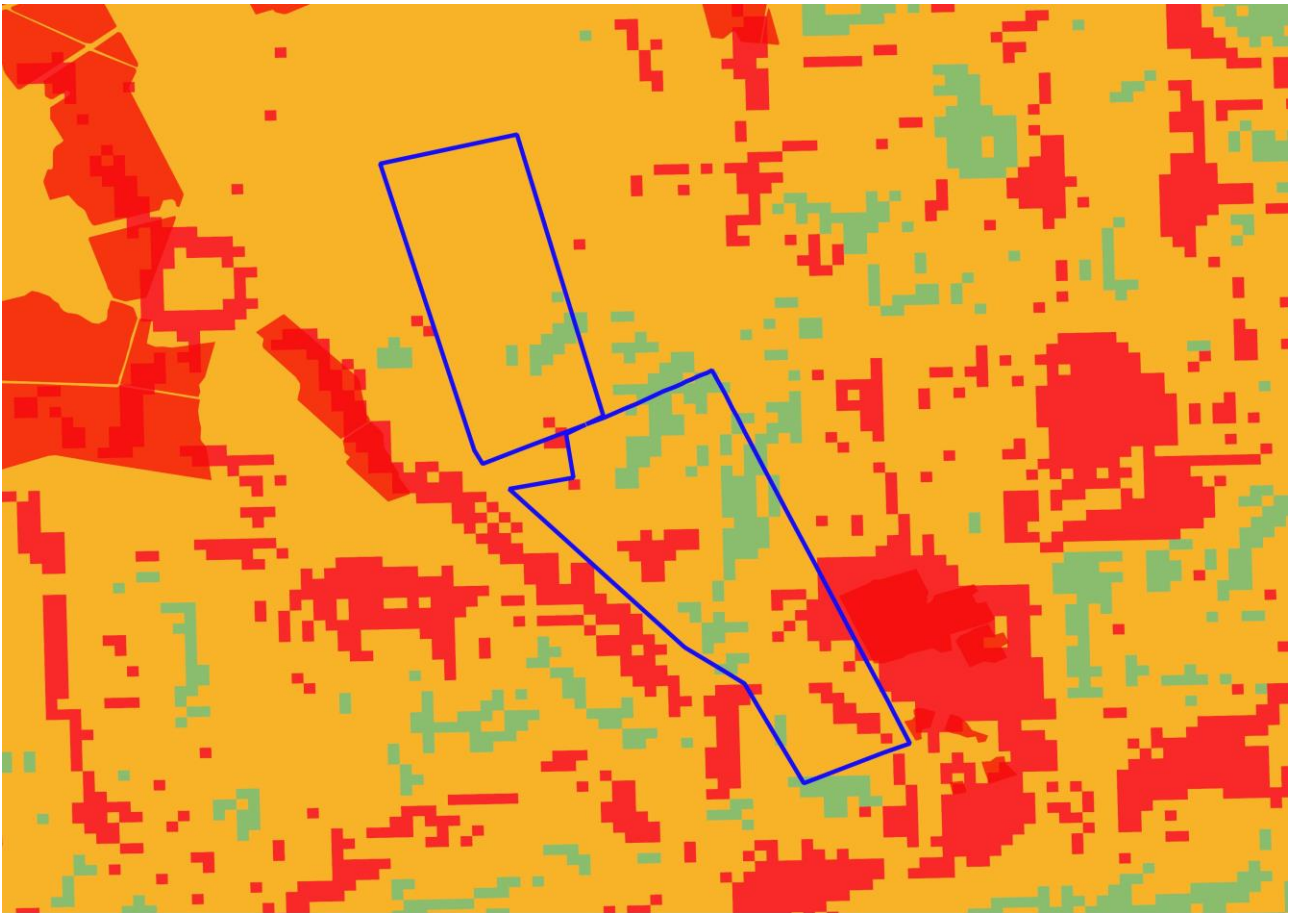


Figure 2. The assessment area overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high). The screening tool's high sensitivity is disputed by this assessment, which verifies the entire assessment area as being of medium agricultural sensitivity.

8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

The purpose of this section of an agricultural impact assessment report is to present the baseline information that controls the agricultural production potential of the site so that an assessment of that potential can be made. Agricultural production potential is one of the three factors that determines the significance of the agricultural impact (see Section 9).

All important parameters that control the agricultural production potential of the site are given in Table 2. The land type soil data is given in Appendix 5. A satellite image map of the development site is given in Figure 3 and photographs of site conditions are given in Figures 4 and 5.

The site falls outside of an area that is classified as a Protected Agricultural Area. A Protected Agricultural Area is a demarcated area in which the climate, terrain, and soil are generally conducive for agricultural production and which, historically, has made important contributions to the production of the various crops that are grown across South Africa. Within Protected

Agricultural Areas, the protection, particularly of arable land, is considered a priority for the protection of food security in South Africa, but the protection of land outside of these areas is generally not considered a food security priority.

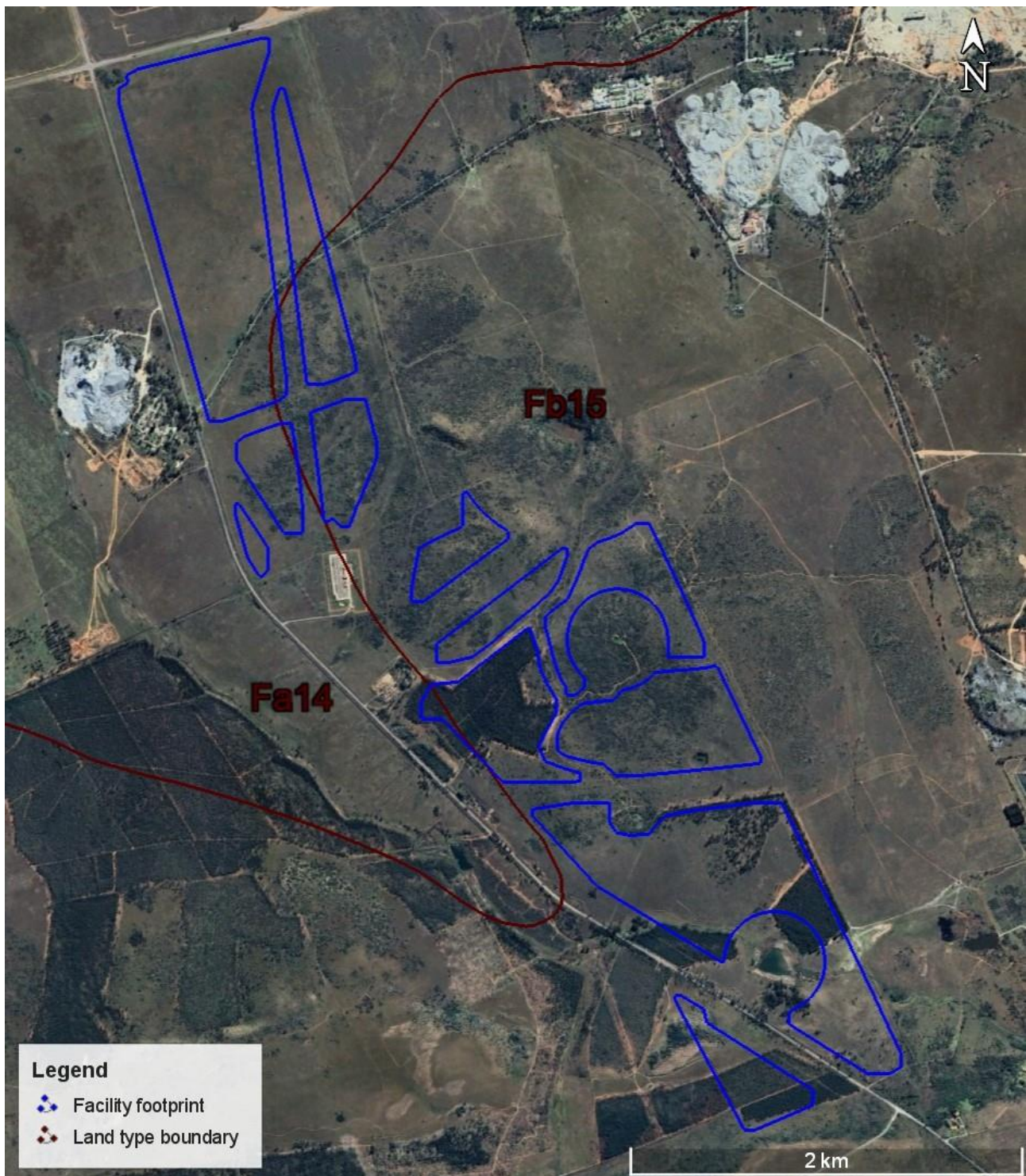


Figure 3. Satellite image map of the assessed agricultural footprint of the facility.

Table 2. Parameters that control and/or describe the agricultural production potential of the site.

	Parameter	Value
Climate	Köppen-Geiger climate description	Temperate, dry winter, warm summer
	Mean Annual Rainfall (mm)	585
	Reference Crop Evaporation Annual Total (mm)	1354
	Climate capability classification (out of 9)	5 (moderate)
Terrain	Terrain type	Highveld plains with some topography
	Terrain morphological units	Mainly scarp and mid-slope with minimal foot-slope and valley bottom
	Slope gradients (%)	4
	Altitude (m)	1600
	Terrain capability classification (out of 9)	Between 3 and 7, but predominantly 6 (moderate to high)
Soil	Geology	Malmani subgroup; Dolomite, stromatolitic, interbedded chert, minor carbonaceous shale, limestone and quartzite
	Land type	Fb15 and Fa14
	Description of soils	Predominantly very shallow, medium textured, well-drained soils on underlying weathered bedrock
	Dominant soil forms	Mispah, Glenrosa, Hutton
	Soil capability classification (out of 9)	Between 3 and 6, but predominantly 4 (low to moderate)
Land use	Agricultural land use in the surrounding area	grazing (cattle)
	Agricultural land use on the site	grazing
	Land Cover classification on the site	Natural grassland, fallow land and continuous & dense plantation forest
General	Long-term grazing capacity (hectares per Large Stock Unit)	6 (very high)
	Land capability classification (out of 15)	Between 3 and 10, but predominantly 7 (low to moderate)
	Within Protected Agricultural Area	No



Figure 4. Photograph of typical site conditions.



Figure 5. Photograph of typical site conditions.

8.1 Assessment of the agricultural production potential

This assessment of the agricultural production potential of the site is based on an integration of the different parameters in Table 2 above.

The cropping potential of the site is limited predominantly by the shallow soils. The site is not suitable for rain-fed crop production. The limited agricultural potential of the site limits its agricultural use to grazing only.

9 ASSESSMENT OF THE AGRICULTURAL IMPACT

9.1 Impact identification and assessment

It should be noted that an Agricultural Compliance Statement is not required to formally rate agricultural impacts by way of impact assessment tables.

An agricultural impact is a change to the future agricultural production potential of land. In most developments, including the one being assessed here, this is primarily caused by the exclusion of agriculture from the footprint of the development. Soil erosion and degradation may also contribute to loss of agricultural production potential. The significance of an agricultural impact is a direct function of the following three factors:

1. the size of the footprint of land from which agriculture will be excluded (or the footprint that will have its potential decreased)
2. the baseline production potential (particularly cropping potential) of that land
3. the length of time for which agriculture will be excluded (or for which potential will be decreased).

The most significant agricultural impact possible, ignoring the length of time component, is therefore a loss of a large area of high yielding cropland and the least significant impact is a loss of a small area of low carrying capacity grazing land.

Cropping potential is highlighted in factor 2, above, because the threshold, above which it is a priority to conserve land for agricultural production, is determined by the scarcity of arable crop production land in South Africa and the relative abundance of land that is only good enough to be used for grazing. If land can support viable and sustainable crop production, then it is considered to be above the threshold and is a priority for being conserved as agricultural production land. If land is unable to support viable and sustainable crop production, then it is considered to be below the threshold and of much lower priority for being conserved.

In this case, the total footprint of land that will be lost, which will be lost for the lifetime of the development, is approximately 388 hectares. The production potential of that land is limited to only being suitable as grazing land. The loss of grazing land, of which there is no particular scarcity in the country, represents a minimal loss of agricultural production potential in terms of national food security and for the affected farm.

It is also important to note that renewable energy facilities have both positive and negative affects and it is the net sum of these positive and negative affects that determines the extent of the overall change in future production potential.

The development will provide a positive economic impact on the farm. The income generated by the farming enterprises through the lease of the land to the energy facility is highly likely to exceed the potential agricultural income from the site. It will diversify the farm's income sources and provide reliable and predictable income that is independent of variable agricultural economic factors such as weather, agricultural markets and agricultural input costs. This is likely to increase cash flow and financial security and may improve farming operations and productivity on the rest of the farm or other properties owned by the same farmer through increased investment into farming.

Due to the fact that the agricultural land loss is not of viable cropland and that its negative impact is offset by economic benefits to farming, the overall negative agricultural impact of the development is assessed here as being of low significance.

9.2 Cumulative impact assessment

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential. The defining question for assessing the cumulative agricultural impact is this:

What loss of future agricultural production potential is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?

Department of Forestry, Fisheries and the Environment (DFFE) requires compliance with a specified methodology for the assessment of cumulative impacts. This is positive in that it ensures engagement with the important issue of cumulative impacts. However, the required compliance has some limitations and can, in the opinion of the author, result in an over-focus on methodological compliance, while missing the more important task of effectively answering the above defining question.

This cumulative impact assessment will consider all renewable energy projects within a 30 km radius. The quantification of the cumulative impact will be done in detail in the EIA phase. This is highly likely to confirm that the cumulative impact of loss of future agricultural production potential is low. The development is highly likely to have an acceptable impact on the agricultural production capability of the area and therefore be recommended for approval from a cumulative agricultural impact point of view.

It should also be noted that renewable energy development can only be located in fairly close proximity to a substation that has available capacity. This creates cumulative impact in such places. However, this is acceptable because it also effectively protects most agricultural land in the country from renewable energy development because only a small proportion of the country's total land surface is located in close enough proximity to an available substation to be viable for renewable energy development.

9.3 Mitigation measures

Generic mitigation measures that are effective in preventing soil degradation are all inherent in the project engineering and/or are standard, best-practice for construction sites.

- A system of storm water management, which will prevent erosion on and downstream of the site, will be an inherent part of the engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.
- Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it remains at the surface. Topsoil should

only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire cut surface. It will be advantageous to have topsoil and vegetation cover below the panels during the operational phase to control dust and erosion.

9.4 Compliance with the allowable development limits

The agricultural protocol stipulates allowable development limits for renewable energy developments of > 20 MW. Allowable development limits refer to the area of a particular agricultural sensitivity category that can be directly impacted (i.e. taken up by the physical footprint) by a renewable energy development. The agricultural footprint is defined in the protocol as the area that is directly occupied by all infrastructures, including roads, hard standing areas, buildings, substations etc., that are associated with the renewable energy facility during its operational phase, and that result in the exclusion of that land from potential cultivation or grazing. It excludes all areas that were already occupied by roads and other infrastructure prior to the establishment of the energy facility but includes the surface area required for expanding existing infrastructure (e.g. widening existing roads). It excludes the corridor underneath overhead power lines but includes the pylon footprints. It therefore represents the total land that is actually excluded from agricultural use as a result of the renewable energy facility (the agricultural footprint).

For a solar energy facility, the footprint is considered to be the total area inside the security fence of the facility.

The allowable development limit on land of medium agricultural sensitivity with a land capability of < 8, as this site has been verified to be, is 2.5 ha per MW. This would allow the proposed facility with a total generating capacity of 200 MW to occupy an agricultural footprint of $200 \times 2.5 = 500$ hectares. The proposed footprint of the facility is approximately 388 hectares. It is therefore confirmed that the facility is in line with the allowable development limits contained in the agricultural protocol.

10 CONCLUSION: AGRICULTURAL COMPLIANCE STATEMENT

The screening tool rating of the agricultural sensitivity of the assessment area is mostly medium. but it includes some areas of high sensitivity. This assessment disputes the classified land capability, based on the assessment of the cropping potential of the site in this report. It verifies the land capability as a maximum of 7 (unsuitable for cropping). This assessment therefore

disputes the high sensitivity rating by the screening tool and verifies the entire assessment area as being of medium agricultural sensitivity.

The cropping potential of the site is limited predominantly by the shallow soils. The site is not suitable for rain-fed crop production. The limited agricultural potential of the site limits its agricultural use to grazing only.

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of the development. The significance of an agricultural impact is a direct function of the following three factors:

1. the size of the footprint of land from which agriculture will be excluded (or the footprint that will have its potential decreased)
2. the baseline production potential (particularly cropping potential) of that land
3. the length of time for which agriculture will be excluded (or for which potential will be decreased).

In this case, the total footprint of land that will be lost, which will be lost for the life time of the development, is approximately 388 hectares. The production potential of that land is limited to only being suitable as grazing land. The loss of grazing land, of which there is no particular scarcity in the country, represents a minimal loss of agricultural production potential in terms of national food security and for the affected farm. Due to the fact that no viable cropland is lost as a result of this development, its negative agricultural impact is therefore assessed as being of low significance and as acceptable.

Its acceptability is substantiated by the following points:

- The amount of agricultural land use by the development is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation because degradation can be effectively prevented by standard, generic, best practice mitigation actions that are inherent in the project engineering.
- The proposed development offers a positive impact on agriculture by way of improved financial security for farming operations.
- The PV panels will not necessarily totally exclude agricultural production. The area can still be used to graze sheep that will, in addition, be protected against stock theft within the security area of the facility.

- The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy.
- In addition, the proposed development will contribute to the country's urgent need for energy generation, particularly renewable energy that has much lower environmental and agricultural impact than existing, coal powered energy generation.
- All renewable energy development in South Africa decreases the need for coal power and thereby contributes to reducing the large agricultural impact that open cast coal mining has on highly productive agricultural land throughout the coal mining areas of the country.

From an agricultural impact point of view, it is recommended that the proposed development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

11 REFERENCES

Crop Estimates Consortium, 2019. *Field Crop Boundary data layer, 2019*. Pretoria. Department of Agriculture, Forestry and Fisheries.

Department of Agriculture Forestry and Fisheries, 2018. Long-term grazing capacity map for South Africa developed in line with the provisions of Regulation 10 of the Conservation of Agricultural Resources Act, Act no 43 of 1983 (CARA), available on Cape Farm Mapper. Available at: <https://gis.elsenburg.com/apps/cfm/>

Department of Agriculture, Forestry and Fisheries, 2017. National land capability evaluation raster data layer, 2017. Pretoria.

Department of Agriculture, Forestry and Fisheries, 2002. National land type inventories data set. Pretoria.

Department of Agriculture, Land Reform and Rural Development. 2020. Protected agricultural areas – Spatial data layer. 2020. Pretoria.

Schulze, R.E. 2009. SA Atlas of Climatology and Agrohydrology, available on Cape Farm Mapper. Available at: <https://gis.elsenburg.com/apps/cfm/>

Soil Classification Working Group. 1991. Soil classification: a taxonomic system for South Africa. Soil and Irrigation Research Institute, Department of Agricultural Development, Pretoria.

APPENDIX 1: SPECIALIST CURRICULUM VITAE

Johann Lanz Curriculum Vitae

Education

M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - 1997
B.Sc. Agriculture (Soil Science, Chemistry)	University of Stellenbosch	1992 - 1995
BA (English, Environmental & Geographical Science)	University of Cape Town	1989 - 1991
Matric Exemption	Wynberg Boy's High School	1983

Professional work experience

I have been registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science since 2012 (registration number 400268/12) and am a member of the Soil Science Society of South Africa.

Soil & Agricultural Consulting Self employed 2002 - present

Within the past 5 years of running my soil and agricultural consulting business, I have completed more than 170 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, electrical grid infrastructure, urban, and agricultural developments. I was the appointed agricultural specialist for the nation-wide SEAs for wind and solar PV developments, electrical grid infrastructure, and gas pipelines. My regular clients include: Zutari; CSIR; SiVEST; SLR; WSP; Arcus; SRK; Environamics; Royal Haskoning DHV; ABO; Enertrag; WKN-Windcurrent; JG Afrika; Mainstream; Redcap; G7; Mulilo; and Tiptrans. Recent agricultural clients for soil resource evaluations and mapping include Cederberg Wines; Western Cape Department of Agriculture; Vogelfontein Citrus; De Grendel Estate; Zewenwacht Wine Estate; and Goedgedacht Olives. In 2018 I completed a ground-breaking case study that measured the agricultural impact of existing wind farms in the Eastern Cape.

Soil Science Consultant Agricultural Consultants International (Tinie du Preez) 1998 - 2001

Responsible for providing all aspects of a soil science technical consulting service directly to clients in the wine, fruit and environmental industries all over South Africa, and in Chile, South America.

Contracting Soil Scientist De Beers Namaqualand Mines July 1997 - Jan 1998

Completed a contract to advise soil rehabilitation and re-vegetation of mined areas.

Publications

- Lanz, J. 2012. Soil health: sustaining Stellenbosch's roots. In: M Swilling, B Sebitosi & R Loots (eds). *Sustainable Stellenbosch: opening dialogues*. Stellenbosch: SunMedia.
- Lanz, J. 2010. Soil health indicators: physical and chemical. *South African Fruit Journal*, April / May 2010 issue.
- Lanz, J. 2009. Soil health constraints. *South African Fruit Journal*, August / September 2009 issue.
- Lanz, J. 2009. Soil carbon research. *AgriProbe*, Department of Agriculture.
- Lanz, J. 2005. Special Report: Soils and wine quality. *Wineland Magazine*.

I am a reviewing scientist for the *South African Journal of Plant and Soil*.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

APPENDIX 2: DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

File Reference Number:

NEAS Reference Number:

Date Received:

(For official use only)

DEA/EIA/

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

THE CARPE DIEM SOLAR FACILITY NEAR CARLETONVILLE IN GAUTENG PROVINCE

Kindly note the following:

- This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
- This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
- A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
- All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
- All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Private Bag X447, Pretoria, 0001

Physical address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Environment House, 473 Steve Biko Road, Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Johann Lanz – Soil Scientist			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	Johann Lanz			
Specialist Qualifications:	M.Sc. (Environmental Geochemistry)			
Professional affiliation/registration:	Registered Professional Natural Scientist (Pr.Sci.Nat.) Reg. no. 400268/12			
Physical address:	Member of the Soil Science Society of South Africa			
Postal address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
Postal code:	7800	Cell:	082 927 9018	
Telephone:	082 927 9018	Fax:	Who still uses a fax? I don't	
E-mail:	johann@johannlanz.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz**, 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 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company:

Date

Details of Specialist, Declaration and Undertaking Under Oath

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Johann Lanz**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company:

Date

Signature of the Commissioner of Oaths

Date





herewith certifies that

Johan Lanz

Registration Number: 400268/12

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Soil Science (Professional Natural Scientist)

Effective **15 August 2012**

Expires **31 March 2024**



A handwritten signature in black ink, appearing to read 'A. Venter'.

Chairperson

A handwritten signature in black ink, appearing to read 'M. M. M. M.'.

Chief Executive Officer



To verify this certificate scan this code

APPENDIX 4: PROJECTS INCLUDED IN CUMULATIVE IMPACT ASSESSMENT

Table 1: Table of all projects that were included in the cumulative impact assessment.

DFFE Reference	Project name	Technology	Capacity (MW)
Total solar			
Total wind			
Total			

Note: Quantification of cumulative impacts will be done in detail in the EIA phase.

APPENDIX 5: SOIL DATA

Table of land type soil data

Land type	Soil series (forms)	Depth (mm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	% of land type
Fb15	Hu	250 > 1200	15 - 25	18 - 32	so,R	28,4
Fb15	Ms	100 - 200	15 - 25		R	19,6
Fb15	R					19,1
Fb15	Gs	100 - 350	15 - 25		so,R	18,6
Fb15	Oa Du	600 > 1200	18 - 35	20 - 40	R,so	4,3
Fb15	Ar Rg	600 - 800	45 - 60		so,R	2,6
Fb15	Cv	400 - 800	15 - 25	18 - 35	so,R	2,5
Fb15	Hu Sd	250 > 1200	30 - 45	35 - 55	so,R	1,9
Fb15	Cv	400 - 800	5 - 10	6 - 15	so,R	1,7
Fb15	Av26Av36	600 - 800	15 - 25	18 - 35	B2gc	0,8
Fb15	S					0,5
Fa14	Ms Gs	100 - 150	10 - 20		so,R,hp	49,6
Fa14	Hu	250 > 1200	10 - 25	13 - 30	R,so	38,2
Fa14	R					10,2
Fa14	We Cv Av Wo	250 > 1200	20 - 40	20 - 40	so, R, G	2,0