

**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 HARDEVELD PV SOLAR ENERGY FACILITY  
NEAR BEAUFORT WEST, WESTERN CAPE**

**Report by  
Johann Lanz**

**24 February 2022**

## Table of Contents

Executive Summary .....	1
1 Introduction .....	2
2 Project description .....	3
3 Terms of reference .....	4
4 Methodology of study .....	5
4.1 Methodology for assessing the agro-ecosystem .....	5
5 Assumptions, uncertainties or gaps in knowledge or data .....	6
6 Applicable legislation and permit requirements .....	6
7 Site sensitivity verification .....	6
8 Agricultural land use .....	9
9 Assessment of agricultural impact .....	9
9.1 General .....	9
9.2 Impact identification and discussion .....	10
9.3 Cumulative impacts .....	11
9.4 Impacts of the no-go alternative .....	12
9.5 Comparative assessment of alternatives .....	13
9.6 Micro-siting to minimize fragmentation and disturbance of agricultural activities ...	13
9.7 Confirmation of linear activity impact .....	13
9.8 Impact footprint .....	13
9.9 Impact assessment and statement .....	14
10 Environmental Management Programme Inputs .....	14
11 Conclusions .....	20
12 References .....	20
Appendix 1: Specialist Curriculum Vitae .....	22
Appendix 2: Details of the specialist, declaration of interest and undertaking under oath...	23
Appendix 3: Projects considered for cumulative impact assessment .....	25

## EXECUTIVE SUMMARY

The key findings of this study are:

- The site has very low agricultural potential predominantly because of climate constraints.
- As a result of the constraints, the site is totally unsuitable for cultivation, and agricultural land use is limited to grazing.
- The land is predominantly of medium agricultural sensitivity, but includes some areas of low sensitivity.
- Three potential negative agricultural impacts were identified, loss of agricultural land use; land degradation; and impacts of dust, but all are of low significance.
- The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.
- The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the land is of limited land capability and is not suitable for the production of cultivated crops, the amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol, the proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as wider, societal benefits, and that the proposed development poses a low risk in terms of causing soil degradation.
- From an agricultural impact point of view, it is recommended that the proposed development be approved.

## 1 INTRODUCTION

Environmental authorisation is being sought for the Bulskop PV solar energy facility, near Beaufort West, Western Cape (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 sensitivity of the site, the level of agricultural assessment required is an Agricultural Compliance Statement.



**Figure 1.** Locality map of the proposed PV facility, south-east of the town of Beaufort West.

Johann Lanz was appointed as an independent agricultural specialist to conduct the agricultural assessment. The objective and focus of an agricultural assessment is to assess whether or not the proposed development will have an unacceptable agricultural impact or not, and based on this, to make a recommendation on whether it should be approved or not.

The aim of the protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources is to preserve valuable agricultural land for agricultural production. Valuable land is considered to be predominantly scarce arable land that is suitable for the viable production of cultivated crops. All land that is excluded from agricultural use by this development is not suitable for crop production and is therefore not considered particularly preservation-worthy as agricultural production land.

## 2 PROJECT DESCRIPTION

The Applicant, Hardeveld PV (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as the Hardeveld PV) located on the Remaining Extent (Portion 0) of Farm 423 approximately 12 km south-east of Beaufort West in the Western Cape Province. The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 120 MW. The project is situated within the Beaufort West Local Municipality within the Central Karoo District Municipality.

Five additional 120 MW PV facilities are concurrently being considered on the property and are assessed through separate Basic Assessment processes, namely:

- Gamka PV;
- Rosenia PV;
- Hoodia PV;
- Salsola PV; and
- Bulskop PV.

A development footprint of approximately 242 ha is being assessed as part of this Basic Assessment Report (BAR) and the infrastructure associated with the 120 MW facility includes:

- PV modules and mounting structures;
- Inverters and transformers;
- Cabling;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 8 m wide);
- Auxiliary buildings (33 kV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Perimeter fencing and security infrastructure;
- Rainwater tanks;
- Temporary and permanent laydown areas;
- Facility substation;
- Own-build grid connection solution, including up to 132 kV line between the project components and the facility substation (within a 50 m wide and 2 km in length corridor);

The Hardeveld PV facility intends to connect to the National Grid via the Droerivier Main Transmission Substation (MTS) (approximately 17.5 km west of the facility), however, the grid connection infrastructure associated with this grid solution is being assessed as part of a separate Environmental Application.

The exact nature of the different infrastructure within a renewable energy development has absolutely no bearing on the significance of agricultural impacts. It is therefore not necessary to detail the design and layout of the facility any further in this assessment. Whether the footprint comprises a solar panel, a road or a substation is irrelevant to agricultural impact. What is of relevance is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land. That total footprint for the Hardeveld facility is 242 hectares.

### 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 site was verified in this assessment as being of medium and low sensitivity for impacts on agricultural resources. The level of agricultural assessment required in terms of the protocol (and hence in terms of NEMA) for sites of less than high sensitivity is an Agricultural Compliance Statement. The protocol also requires that a Site Sensitivity Verification be done.

The terms of reference for such an assessment, as stipulated in the 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).
2. The compliance statement must:
  1. be applicable to the preferred site and proposed development footprint;
  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 9.9).
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 9.8);
  5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol (Section 9.8);
  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

(Section 9.6);

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 9.8);
8. any conditions to which this statement is subjected (Section 11);
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 (Section 9.7);
10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (Section 10); and
11. a description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 5).

## **4 METHODOLOGY OF STUDY**

### **4.1 Methodology for assessing the agro-ecosystem**

As per the protocol requirement, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the site. The following sources of existing information were 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.
- 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.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Satellite imagery of the site and surrounds was sourced from Google Earth.

## **5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA**

The study makes the assumption that sufficient water for irrigation is not available in the study area. This is based on the assumption that a long history of farming experience in an area will result in the exploitation of viable water sources if they exist, and none have been exploited in the study area.

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

## **6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS**

The Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) requires that any long-term lease associated with the renewable energy facility be approved by the Department of Agriculture, Land Reform and Rural Development (DALRRD). The SALA consent is separate from the application for Environmental Authorisation, and needs to be applied for and obtained separately.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). A consent in terms of CARA is required for the cultivation of virgin land. Cultivation is defined in CARA as “any act by means of which the topsoil is disturbed mechanically”. The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from the construction of a renewable energy facility and its associated infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by Anneliza Collett (Acting Scientific Manager: Natural Resources Inventories and Assessments in the Directorate: Land and Soil Management of the Department of Agriculture, Land Reform and Rural Development (DALRRD)). The construction and operation of the facility will therefore not require consent from the Department of Agriculture, Land Reform and Rural Development in terms of this provision of CARA.

## **7 SITE SENSITIVITY VERIFICATION**

In terms of the gazetted agricultural protocol, a site sensitivity verification must be submitted that:

1. confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
2. contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

Agricultural sensitivity, in terms of environmental impact, and as used in the national web-based environmental screening tool, is a direct function of the capability of the land for agricultural production. This is because a negative impact, or exclusion of agriculture, on land of higher

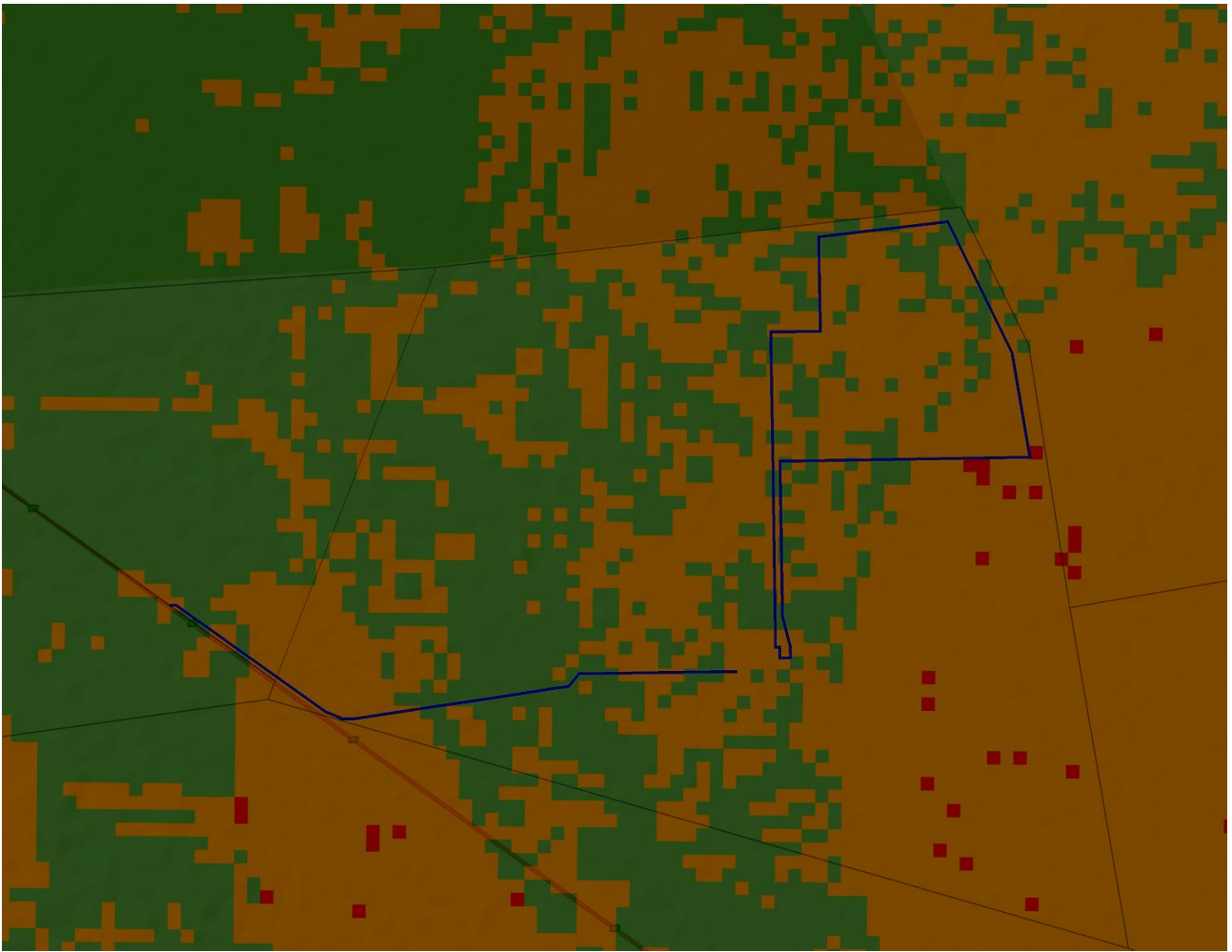


agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability. The general assessment of agricultural sensitivity that is employed in the national web-based environmental screening tool, identifies all arable land that can support viable production of cultivated crops, as high (or very high) sensitivity. This is because there is a scarcity of arable production land in South Africa and its conservation for agricultural use is therefore a priority. Land which cannot support viable production of cultivated crops is much less of a priority to conserve for agricultural use, and is rated as medium or low agricultural sensitivity.

The screening tool classifies agricultural sensitivity according to only two independent criteria – the land capability rating and whether the land is cultivated or not. All cultivated land is classified as at least high sensitivity, based on the logic that if it is under cultivation, it is indeed suitable for cultivation, irrespective of its land capability rating.

The screening tool sensitivity categories in terms of land capability are based upon the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability values ( $\geq 8$  to 15) are likely to be suitable as arable land for the production of cultivated crops, while lower values are only likely to be suitable as non-arable, grazing land, or at the lowest extreme, not even suitable for grazing.

A map of the proposed development area overlaid on the screening tool sensitivity is given in Figure 2. Because none of the land is classified a cultivated land, agricultural sensitivity is purely a function of land capability. The land capability of the site on the screening tool is predominantly 6, but varies from 5 to 8. Values of 5 translate to a low agricultural sensitivity and values of 6 to 8 translate to a medium agricultural sensitivity.

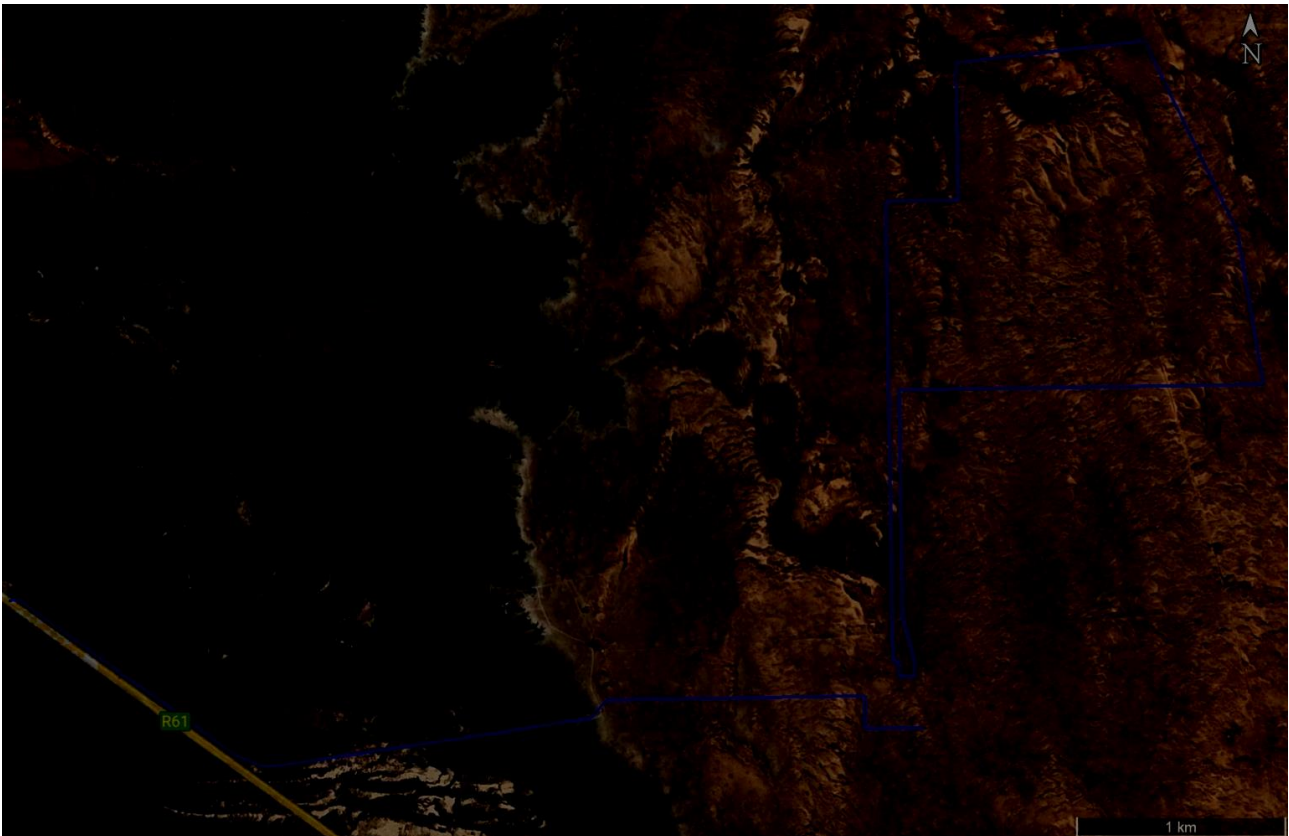


**Figure 2.** The proposed agricultural footprint of the development (blue outline), including the access road to the west (blue line), overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high).

The small scale differences in land capability across the project area are not very significant and are more a function of how the land capability data is generated by modelling, than actual meaningful differences in agricultural potential on the ground.

The medium and low sensitivity attributed to the site by the screening tool is confirmed by this assessment. The reason for confirming is that the climate data (low rainfall of approximately 200 mm per annum and high evaporation of approximately 1,475 mm per annum) proves the area to be arid, and therefore of limited land capability. Moisture availability is totally insufficient for the cultivation of crops without irrigation and therefore, a land capability value of higher than 7 is not justified for the site.

This site sensitivity verification verifies the entire site as being of less than high agricultural sensitivity (a maximum land capability value of 7). The required level of agricultural assessment is therefore confirmed as an Agricultural Compliance Statement.



**Figure 3.** *Satellite image map of the agricultural footprint of the proposed development.*

## **8 AGRICULTURAL LAND USE**

The farm is located in a sheep farming agricultural area, and grazing of both sheep and game is by far the dominant agricultural land use in the area. Grazing capacity of the site is low at 30 hectares per large stock unit. There is almost no cultivation in the area and what there is, is confined to small, isolated patches of irrigated land.

## **9 ASSESSMENT OF AGRICULTURAL IMPACT**

### **9.1 General**

The focus and defining question of an agricultural impact assessment is to determine to what extent a proposed development will compromise (negative impacts) or enhance (positive impacts) current and/or potential future agricultural production. The significance of an impact is therefore a direct function of the degree to which that impact will affect current or potential future agricultural production. If there will be no impact on production, then there is no agricultural impact. Impacts that degrade the agricultural resource base, pose a threat to production and therefore are within the scope of an agricultural impact assessment.

The exact nature of the different infrastructure within a renewable energy development has absolutely no bearing on the significance of agricultural impacts. What is of relevance is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land.

It is also important to consider the scale at which the significance of an impact is assessed. An agricultural impact equates to a temporary or permanent change in agricultural production potential of the land. The change in production potential of a farm or significant part of a farm will obviously always be highly significant at the scale of that farm, but may be much less so at larger scales. This assessment considers a regional and national scale to be the most appropriate one for assessing the significance of the loss of agricultural production potential.

## 9.2 Impact identification and discussion

Three potential negative agricultural impacts have been identified, that are direct impacts:

1. **Loss of agricultural potential by occupation of land** - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use, with consequent potential loss of agricultural productivity and employment. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
2. **Loss of agricultural potential by soil degradation** – This impact only becomes relevant once the land is returned to agricultural land use after decommissioning. Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact occurs only during the construction and decommissioning phases. Due to the very low slope of the land, the site has a low susceptibility to soil erosion.
3. **Dust impact** – The disturbance of the soil surface, particularly during construction, will generate dust that can negatively impact surrounding veld and farm animals.

One positive agricultural impact has been identified, that is an indirect impact:

1. **Enhanced agricultural potential through increased financial security for farming operations**

- Reliable income will be generated through the lease of the land to the energy facility. This is likely to increase cash flow and financial security of land owners and could improve farming operations and productivity through increased investment into farming.

### 9.3 Cumulative impacts

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. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the impacts associated with this project, but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

The most important concept related to 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 agricultural land, with a consequent decrease in agricultural production. The defining question for assessing the cumulative agricultural impact is this:

What level of loss of agricultural land use and associated loss of agricultural production 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?

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.

DFFE compliance for this project requires considering all renewable energy projects within a 30 km radius. There are 6 such other renewable energy projects (see Appendix 3).

In quantifying the cumulative impact, the area of land taken out of grazing as a result of these 6 projects plus this one, and the others associated with it (total generation capacity of 1,319 MW) will amount to a total of approximately 3,298 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to only 1.17% of the surface area. That is considered to be within an acceptable limit in terms of loss of agricultural land that is only suitable for grazing, of which there is no scarcity in the country. This is particularly so when considered within the context of the following point:

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no cultivation potential, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

As discussed above, the risk of a loss of agricultural potential by soil degradation is low and can effectively be mitigated for renewable energy developments. If the risk for each individual development is low, then the cumulative risk is also low.

Furthermore, there are no significant other land uses, apart from renewable energy, that are competing for agricultural land in the area, and so the total cumulative loss of agricultural land from all competing land uses is not significantly higher than what has been considered above.

Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use will not have an unacceptable negative impact on the agricultural production capability of the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved.

#### **9.4 Impacts of the no-go alternative**

The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. The one identified potential impact is that due to continued low rainfall in the area, which is likely to be exacerbated by climate change, agriculture in the area will come under increased pressure in terms of economic viability.

The development offers an additional income source to agriculture, but it excludes agriculture from the development's agricultural footprint. Therefore, the negative agricultural impact of the

development is more significant than that of the no-go alternative, and so, purely from an agricultural impact perspective, the no-go alternative is the preferred alternative between the development and the no-go. However, the no-go option would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of renewable energy.

#### **9.5 Comparative assessment of alternatives**

Design and layout alternatives and technology alternatives within the footprint will make absolutely no material difference to the significance of the agricultural impacts, because it is the total footprint size that determines the impact significance. Any alternative layout within the footprint is considered acceptable.

#### **9.6 Micro-siting to minimize fragmentation and disturbance of agricultural activities**

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and lack of suitability for cultivation of the site, mean that the exact positions of all infrastructure will not make any material difference to agricultural impacts.

#### **9.7 Confirmation of linear activity impact**

Confirmation of the linear activity impact is not applicable in this case.

#### **9.8 Impact footprint**

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 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 therefore represents the total land that is actually excluded from agricultural use as a result of the renewable energy facility.

The allowable development limit for uncultivated land with a land capability value of less than 8, as this site has been confirmed to be in the site sensitivity verification in Section 7 above, is 2.5 ha per

MW. The proposed agricultural footprint of the facility is 242 hectares and the generation capacity is 120 MW. This is within the 2.5 ha per MW limit.

## **9.9 Impact assessment and statement**

All agricultural impacts of this proposed development are assessed as being of low significance. However, an Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The proposed development will occupy land that is of very limited land capability and is totally unsuitable for the production of cultivated crops. There is not a scarcity of such agricultural land in South Africa and its conservation for agriculture is not therefore a priority.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.
- The proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as wider, societal benefits.

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

## **10 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS**

The environmental management programme inputs for the protection of soil resources for the PV facilities are presented in the tables below for each phase of the development.



Table 1: Management plan for the planning and design phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Design an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. This is included in the stormwater management plan.	Ensure that the stormwater run-off control is included in the engineering design.	Once-off during the design phase.	Holder of the EA

Table 2: Management plan for the construction phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Implement an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the stormwater run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	Every 2 months during the construction phase	Environmental Control Officer (ECO)
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the construction phase	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil	Record GPS positions of all occurrences of	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.		

Table 3: Management plan for the operational phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That existence of hard surfaces causes no erosion on or downstream of the site.	Maintain the stormwater run-off control system. Monitor erosion and remedy the stormwater control system in the event of any erosion	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the stormwater run-off control system and to	Bi-annually	Facility Environmental Manager

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		occurring.	specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That denuded areas are re-vegetated to stabilise soil against erosion	Facilitate re-vegetation of denuded areas throughout the site	Undertake a periodic site inspection to record the progress of all areas that require re-vegetation.	Bi-annually	Facility Environmental Manager

Table 4: Management plan for the decommissioning phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or	Implement an effective system of stormwater run-off control, where it is required - that is	Undertake a periodic site inspection to verify and inspect the effectiveness	Every 2 months during the decommissioning phase, and then every 6 months after	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
	downstream of the site.	at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	and integrity of the stormwater run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	completion of decommissioning, until final sign-off is achieved.	
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	stripping and replacement. Check that topsoil covers the entire disturbed area.		

## 11 CONCLUSIONS

The site has very low agricultural potential predominantly because of climate constraints. As a result of the constraints, the site is totally unsuitable for cultivation, and agricultural land use is limited to grazing. The land is predominantly of medium agricultural sensitivity, but includes some areas of low sensitivity.

Three potential negative agricultural impacts were identified, loss of agricultural land use, land degradation, and the impact of dust, but all are of low significance.

The recommended mitigation measures are implementation of an effective system of stormwater run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the land is of very limited land capability and is not suitable for the production of cultivated crops, the amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol, the proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as wider, societal benefits, and that the proposed development poses a low risk in terms of causing soil degradation.

From an agricultural impact point of view, it is recommended that the 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, other than recommended mitigation.

## 12 REFERENCES

Cape Farm Mapper. Available at: <https://gis.elsenburg.com/apps/cfm/>

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

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.

DEA, 2015. Strategic Environmental Assessment for wind and solar photovoltaic development in South Africa. CSIR Report Number CSIR: CSIR/CAS/EMS/ER/2015/001/B. Stellenbosch.

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

## 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 (Pr.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**

In the past 5 years of running my soil and agricultural consulting business, I have completed more than 120 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, urban, and agricultural developments. My regular clients include: Aurecon; CSIR; SiVEST; Arcus; SRK; Environamics; Royal Haskoning DHV; Jeffares & Green; JG Afrika; Juwi; 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*.



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

(For official use only)

File Reference Number:

NEAS Reference Number:

Date Received:

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

**HARDEVELD PV SOLAR ENERGY FACILITY NEAR BEAUFORT WEST, WESTERN CAPE**

### 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](mailto:EIAAdmin@environment.gov.za)

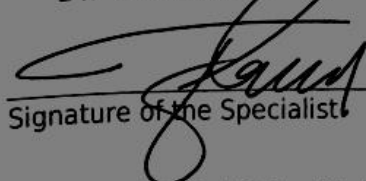
## 1. SPECIALIST INFORMATION

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 Member of the Soil Science Society of South Africa			
Physical address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
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

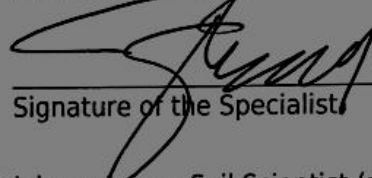
Johann Lanz – Soil Scientist (sole proprietor)

Name of Company:

07/02/2022

## 3. UNDERTAKING UNDER OATH/ AFFIRMATION

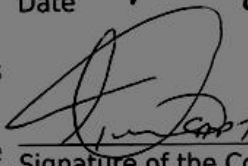
I, **Johann Lanz**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

  
Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company

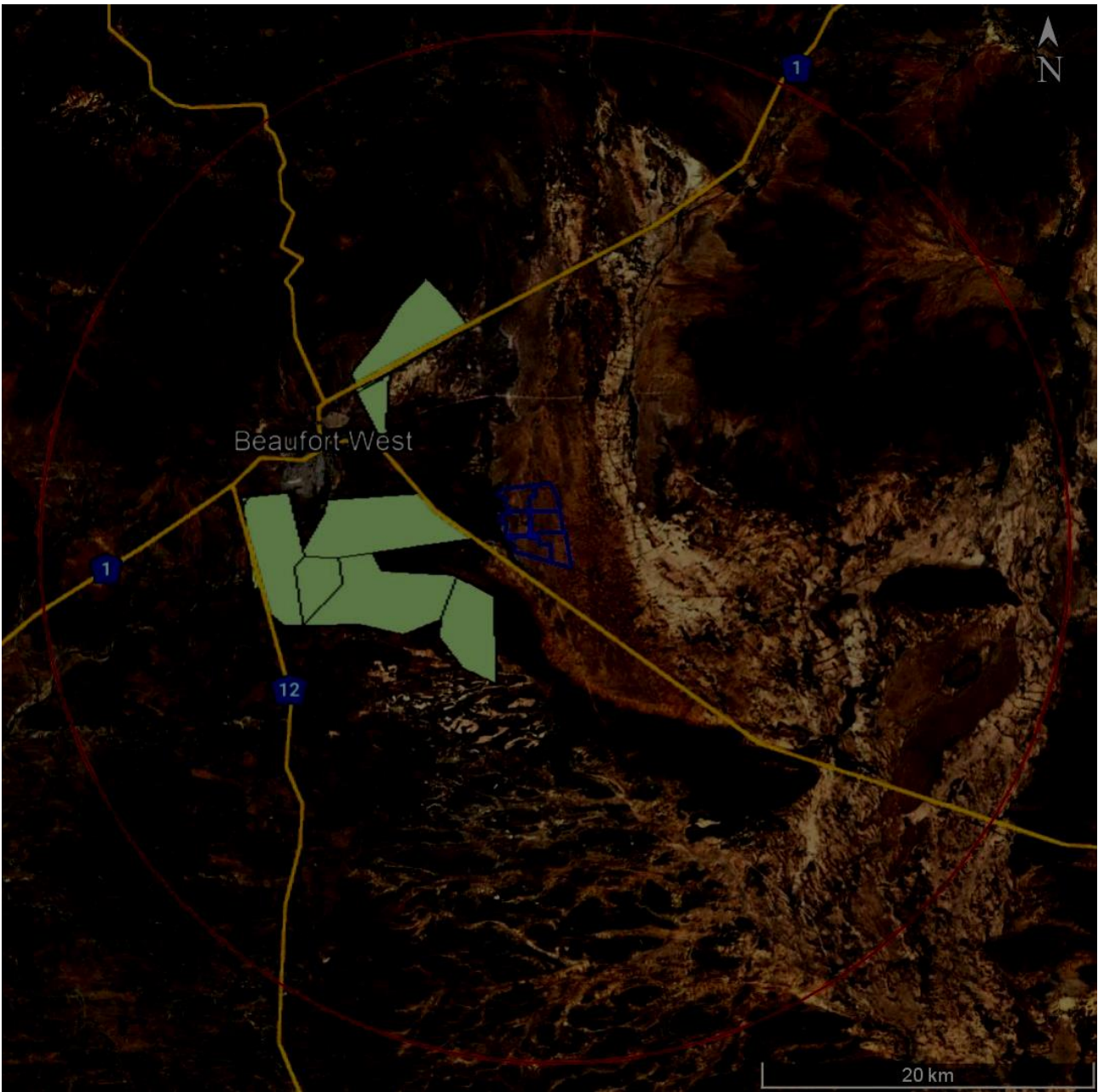
07/02/2022  
Date

  
Signature of the Commissioner of Oaths

2022-02-07  
Date



APPENDIX 3: PROJECTS CONSIDERED FOR CUMULATIVE IMPACT ASSESSMENT



**Figure 4.** Projects considered for cumulative impact assessment.

**Table 5:** Projects considered for cumulative impact assessment.

DFFE Ref number	Project name	MW
12/12/20/2286	The Proposed Beaufort West Photovoltaic Park On Portion9 Of The Farm 161 Kuilspoot in The Western Cape Province	100
14/12/16/3/3/2/774	Proposed Beaufort West Solar power plant site 3 near Beaufort West	75
14/12/16/3/3/2/773	Proposed Establishment of the Beaufort West Solar Power Plant Site 2 Western Cape Province	withd rawn
14/12/16/3/3/2/772	Proposed establishment of the Beaufort West Solar Power Plant Site 1 Western Cape	100
12/12/20/2441	Proposed 300MW PV solar energy facility on the Farm Streenrotsfontein near Beaufort West Western Cape	300
12/12/20/2133	Proposed Construction of 19MW Photovoltaic Solar Facility Proposed By Lurama 214 Pty Ltd On Portion 1 Of The Farm Steenrotsfontein 168 Beaufort West Western Cape	19

**Note:** The MW entries with question marks had no capacity given in the DFFE database, so the amounts above were used as an assumption.