

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

**AGRICULTURAL COMPLIANCE STATEMENT
FOR THE PROPOSED SOLAR PHOTOVOLTAIC FACILITY, "RHINO PV"
ON REMAINDER OF FARM RHENOSTERKOP 155,
BEAUFORT WEST**

**Report by
Johann Lanz**

8 January 2024

Table of Contents

Executive summary	1
1 Introduction	3
2 Project description	4
3 Terms of reference	4
4 Methodology of study	6
5 Assumptions, uncertainties or gaps in knowledge or data	6
6 Applicable legislation and permit requirements	6
7 Site sensitivity verification	7
8 Baseline description of the agro-ecosystem	10
9 Assessment of the agricultural impact	11
9.1 Impact identification and assessment	11
9.2 Cumulative impact assessment	13
9.3 Assessment of alternatives	14
10 Mitigation	15
10.1 Mitigation measures	15
10.2 Inputs to the Environmental Management Programme	1
11 Additional aspects required in an agricultural assessment	1
11.1 Micro-siting	1
11.2 Confirmation of linear activity	1
11.3 Compliance with the allowable development limits	1
12 Conclusion: Agricultural Compliance Statement	2
13 References	4
Appendix 1: Specialist Curriculum Vitae	5
Appendix 2: Specialist declaration form August 2023	6
Appendix 3: SACNASP Registration Certificate	9
Appendix 4: Projects included in cumulative impact assessment	10

EXECUTIVE SUMMARY

South Africa urgently needs electricity generation, and renewable energy offers good potential for that, but requires land. Inevitably agriculturally zoned land will need to be used for much of the renewable energy generation that the country requires. However, to ensure food security, energy facilities should not result in a loss of crop production.

The overall conclusion of this assessment is that the proposed development is acceptable because it can provide benefits to agriculture but leads to no loss of potential cropland and therefore minimal loss of future agricultural production potential.

The site is classified as low to medium agricultural sensitivity by the National Web-Based Environmental Screening Tool promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations, enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA). This has been confirmed by this assessment, because of the agricultural production potential and current agricultural land use.

The arid climate is the limiting factor for land capability, regardless of the soil and terrain capability, although shallow, rocky soils are an additional limitation. Moisture availability is very limiting to any kind of agricultural production, including grazing and is completely insufficient for rain-fed crop production. The climate constraints mean that the site has low agricultural potential, and its agricultural use is limited to grazing only.

An agricultural impact is a change to the future agricultural production potential of land. In this case, the facility fenced area is considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations on its cropping potential. The production potential of the land is limited to only being suitable as grazing land, and there is no particular scarcity of such land in the country, in contrast to arable land, which is very scarce. The use of this land for non-agricultural purposes will cause minimal loss of agricultural production potential in terms of national food security.

Furthermore, the land occupied by PV panels can be used for the dual purposes of solar power generation and agricultural food production by way of sheep grazing. This has potential benefits for both activities and means that the land is not lost to agricultural production. At the farm level, the development will provide a positive economic impact. This is likely to increase financial security and cash flow and improve farming operations and productivity on other parts of the farms through increased investment into farming.

Due to the facts that the solar facility will not occupy scarce, viable cropland, that it can still be used to graze sheep, and that its negative impact is offset by economic benefits to farming, the overall

negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

Its acceptability is further substantiated by the following points:

- The proposed development is within a REDZ, which is an area that has specifically been designated within South Africa for the prioritisation of renewable energy development. The designation of the REDZ has taken into account the country's need to balance renewable energy development against the conservation of land required for agricultural production and national food security.
- 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. Furthermore, a reduction in coal power saves water resources and therefore potentially makes more water available for irrigated agriculture.

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 proposed solar photovoltaic (PV) facility, “Rhino” on remainder of farm Rhenosterkop 155 near Beaufort West (see location in **Figure 1**). In terms of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations), enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA), an application for Environmental Authorisation (EA) requires an agricultural assessment. Government Notice No. 320 of 2020 (GN No. 320), enacted in terms of both the EIA Regulations and NEMA, sets forth the level of specialist assessment required based on the verified sensitivity of the proposed site. In this case, based on the verified low to medium agricultural sensitivity of the total infrastructural footprint of the project (see Section 7 below), the level of agricultural assessment required as per the agricultural protocol (GN No. 320) is an Agricultural Compliance Statement.



Figure 1. Locality map of the development (blue outline) northeast of the town of Beaufort West.

The purpose of an agricultural assessment is to answer the question:

- Will the proposed development cause a significant reduction in agricultural production potential, and most importantly, will it result in a loss of arable land?

Section 9 of this report unpacks this question, particularly with respect to what constitutes a significant reduction. To answer the above question, it is necessary to determine the existing agricultural production potential of the land that will be impacted, and specifically whether it is viable arable land or not. This is done in Section 8 of this report. Section 8, 9, and the conclusion of this report directly address the above question and therefore contain the essence of the agricultural impact assessment.

As is shown in Section 9, this assessed development will not result in any loss of viable, arable land and therefore poses minimal threat to agricultural production potential.

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 (BESS); auxiliary buildings; access and internal roads; on-site independent power producer (IPP) substation; temporary construction laydown areas; and perimeter fencing. The facility will have a total generating capacity of up to 250 megawatts (MW) alternating current.

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, as shown in **Figure 2** and **Figure 3** below, is 543 hectares (ha). The site is located approximately 20 kilometres (km) to the north-east of Beaufort West in the Western Cape Province.

3 TERMS OF REFERENCE

The terms of reference for this study are 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 No. 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA).

The terms of reference for an Agricultural Compliance Statement, as stipulated in GN No. 320, are listed below, and the section number of this report which fulfils each stipulation is given after it in bold.

- 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**.
- The compliance statement must:
 - be applicable to the preferred site and proposed development footprint - **Figure 2 and Figure 3**;
 - confirm that the site is of “low” or “medium” sensitivity for agriculture - **Section 7**; and
 - indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site - **Section 12**.
- The Agricultural Compliance Statement must contain, as a minimum, the following information:
 - 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**;
 - a signed statement of independence by the specialist - **Appendix 2**;
 - a map showing the proposed development footprint (including supporting infrastructure) with a 50 metre buffered development envelope, overlaid on the agricultural sensitivity map generated by the National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations. **Figure 2**;
 - 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 11.3**;
 - confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol (GN No. 320) - **Section 11.3**;
 - 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 11.1**;
 - 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 12**;
 - any conditions to which this statement is subjected - **Section 12**;
 - 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 11.2**;
 - where required, proposed impact management outcomes or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr) - **Section 10**; and

- 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 a verification of current agricultural land use on the site and was informed by existing climate, soil, and agricultural potential data for the site (see references). The 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

This section identifies all applicable legislation and permit requirements over and above what is required in terms of the NEMA.

The development requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) because it is on agriculturally zoned land. This approval is separate to the EA. 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, 1970 (Act 70 of 1970) as amended (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 EA has been obtained.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) as amended (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 construction of 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 DALRRD). The construction and operation of the facility will therefore not require consent from the DALRRD in terms of this provision of CARA.

7 SITE SENSITIVITY VERIFICATION

A specialist agricultural assessment is required to verify the agricultural sensitivity of the development site as per the sensitivity categories used by the National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations. 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 National Web-Based Environmental Screening Tool promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations, enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA) classifies agricultural sensitivity according to two independent criteria, from two independent data sets, both of which may be indicators of the land's agricultural production potential but are limited in that the first is outdated and the second relies on fairly coarse data. The two criteria are:

- whether the land is classified as cropland or not on the field crop boundary data set (Crop Estimates Consortium, 2019); and
- its land capability rating on the land capability data set (DAFF¹, 2017).

All classified 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 DAFF's updated and refined, country-wide land capability mapping (DAFF, 2017). The higher land capability values (≥ 8 to 15) are likely to indicate suitability 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 the agricultural sensitivity in the National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations. is shown in **Table 1**.

Table 1: Relationship between land capability and agricultural sensitivity as given by the National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations.

¹ Department of Agriculture, Forestry and Fisheries

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

The agricultural sensitivity of the site, as given by the National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations, is shown in **Figure 2** .

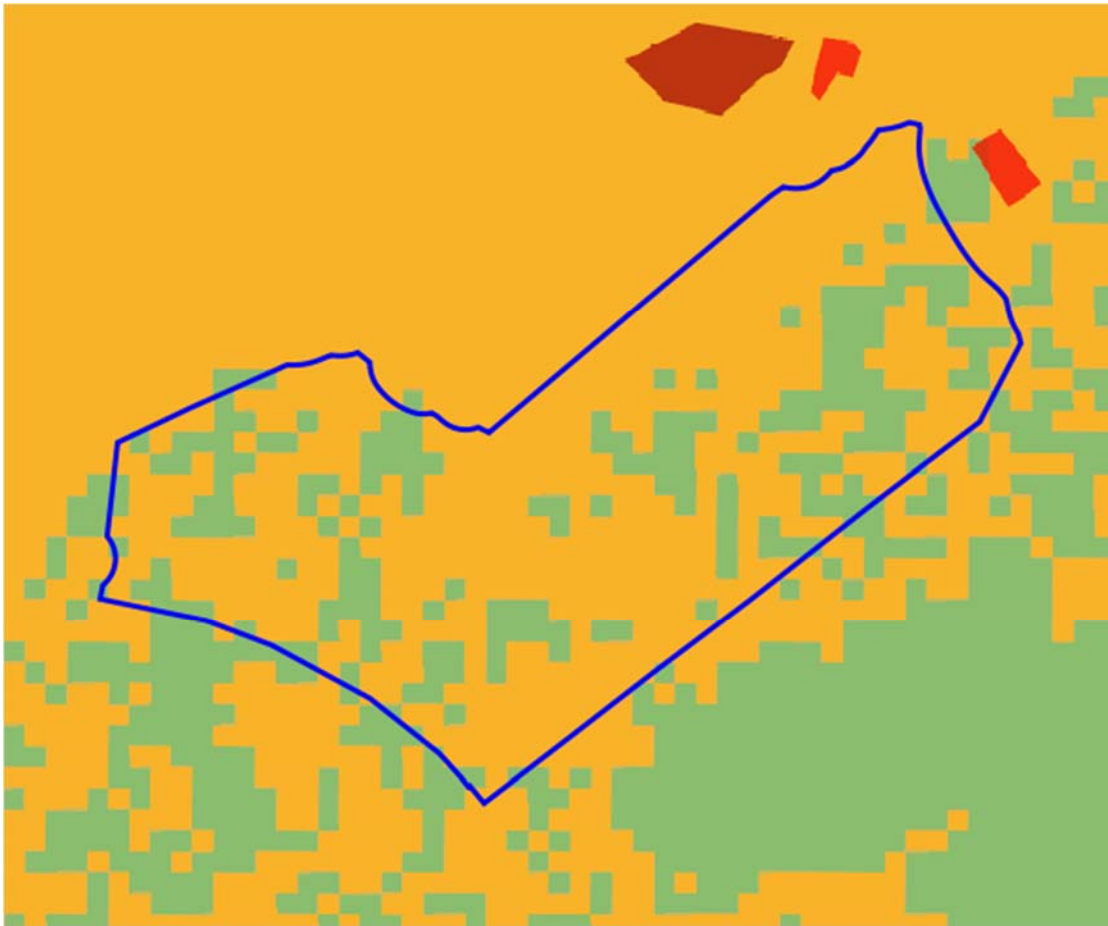


Figure 2. The facility fenced area overlaid on agricultural sensitivity, as given by the National Web-Based Environmental Screening Tool promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations, enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA)(green = low; yellow = medium; red = high; dark red = very high). The National Web-Based Environmental Screening Tool promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations, enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA)low to medium sensitivity is confirmed by this assessment.

The National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations. classifies the fenced area as ranging from low to medium agricultural sensitivity. None of the land is classified as cropland and the rating of agricultural sensitivity is therefore purely a function of classified land capability as per **Table 1**. The classified land capability of the site ranges from 5 to 8. This assessment verifies that the site is not within crop boundaries. It disputes the classified land capability of >7, based on an assessment that the site is unsuitable for viable rain-fed crop production, predominantly because of climate

limitations but also because of soil limitations. The appropriate land capability of land that is unsuitable for viable rain-fed crop production is ≤ 7 because the relationship between land capability and agricultural production potential is such that a land capability of >7 should denote land that is suitable for viable rain-fed crop production. This assessment therefore confirms the low to medium sensitivity rating by the National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations. but disputes a land capability of 8. This assessment rates the entire proposed site as being of low to medium agricultural sensitivity with a maximum land capability of 7.

8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

The purpose of this section of an agricultural 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, and particularly cropping potential is one of three factors that determines the significance of the agricultural impact, together with size of footprint and duration of impact (see Section 9).

The arid climate (mean annual rainfall of 215 millimetres [mm] and evaporation of 1 428 mm [Schulze, 2009]) is the limiting factor for land capability, regardless of the soil and terrain capability, although shallow, rocky soils are an additional limitation. Moisture availability is very limiting to any kind of agricultural production, including grazing and is completely insufficient for rain-fed crop production. The climate constraints mean that the site has low agricultural potential, and its agricultural use is limited to grazing only.

The land has a long-term grazing capacity of 30 ha per large stock unit. Because climate is the limiting factor that controls production potential, it is the only aspect of the agro-ecosystem description that is required for assessing the agricultural impact of this development. All other agricultural potential parameters become irrelevant under the dominant limitation of aridity.

The site falls outside 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.

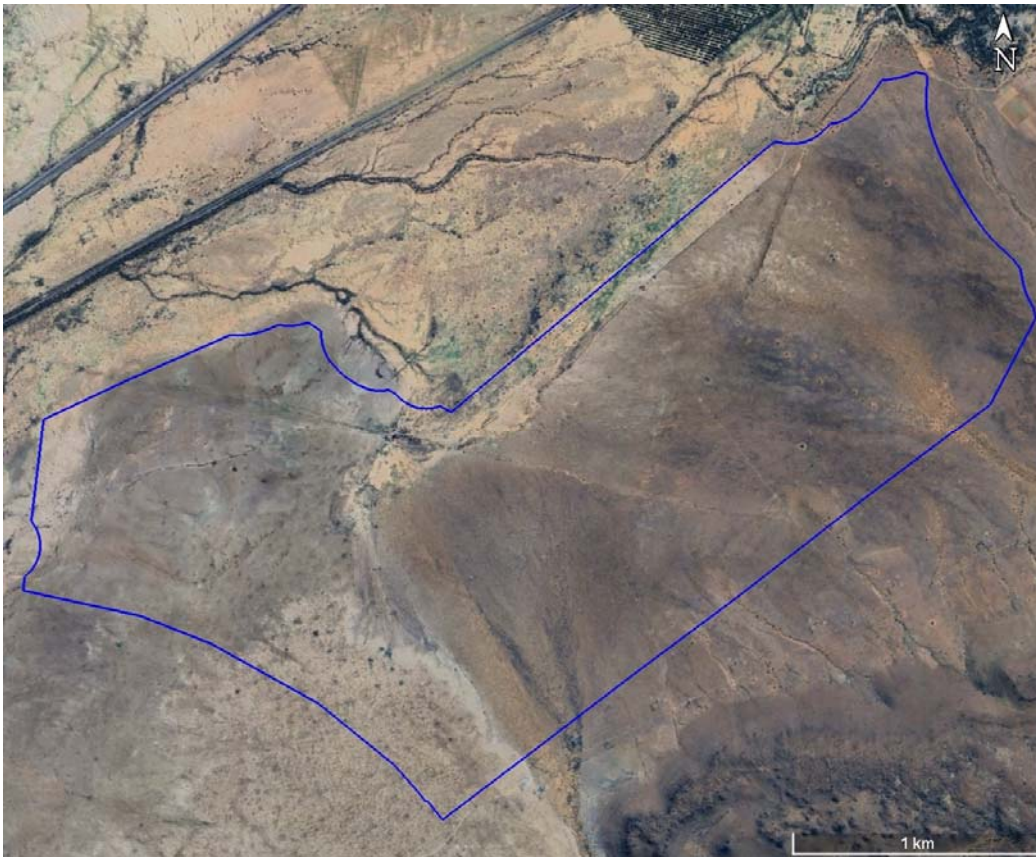


Figure 3. *Satellite image map of the facility fenced area.*

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:

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

The most significant loss of agricultural land possible, for any development anywhere in the country, is of high yielding cropland, and the least significant possible, is 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 (approximately only 13% of the country's surface area) and the relative abundance of the rest of agricultural land across the country 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 entire development footprint is considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations on its cropping potential, discussed in Section 8. The production potential of the land is limited to only being suitable as grazing land, and there is no particular scarcity of such land in the country, in contrast to arable land, which is very scarce. The use of this land for non-agricultural purposes will cause minimal loss of agricultural production potential in terms of national food security.

Furthermore, the land occupied by PV panels can be used for the dual purposes of solar power generation and agricultural food production by way of sheep grazing. This has potential benefits for both activities and means that the land remains agriculturally productive. The benefit for sheep farming is that the security infrastructure of the solar facility will protect the sheep within it against stock theft. The benefit for the solar facility is that the sheep will control the height of the vegetation below the solar panels thus reducing the need to mechanically control the height of vegetation.

At the farm level, the development will provide a positive economic impact. 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. In addition, 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 other parts of the farm or properties owned by the same farmer, through increased investment into farming.

Due to the fact that the solar facility will not occupy scarce, viable cropland, that it can still be used to graze sheep, and that its negative impact is offset by economic benefits to farming, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

9.2 Cumulative Impact Assessment

Specialist assessments for EA are required to assess 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.

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:

- 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?

The EIA Regulations require 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 determines the quantitative loss of agricultural land if all renewable energy project applications within a 30 km radius become operational. These projects are listed in Appendix 4 of this report. In quantifying the cumulative impact, the area of land taken out of agricultural use as a result of all the projects listed in Appendix 4 (total generation capacity of 2 369 MW) will amount to a total of approximately 4 119 ha. This is calculated using the industry standards of 2.5 and 0.3 ha per WM 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 30 km radius (approximately 282 700 ha), this amounts to only 1.46% of the surface area. This is well within an acceptable limit in terms of loss of low potential agricultural land, which is only suitable for grazing, and of which there

is no scarcity in the country. This is particularly so when considered within the context of the following point.

For South Africa to develop the renewable energy generation that it urgently needs, agriculturally zoned land will need to be used for renewable energy generation. It is preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no crop production potential, and low grazing capacity, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country.

All the projects contributing to cumulative impact for this assessment have the same agricultural impacts in a very similar agricultural environment, and therefore the same mitigation measures apply to all.

The loss of agricultural potential by soil degradation can effectively be prevented for renewable energy developments by generic mitigation measures that are all inherent in the project engineering and/or are standard, best-practice for construction sites. Soil degradation does not therefore pose a cumulative impact risk.

Furthermore, it should be noted that there are few land uses, other than renewable energy, that are competing for agricultural land use in this area. The cumulative impact from developments, other than renewable energy, is therefore likely to be low.

It should be noted that a mining permit was recently issued within the Remainder of Farm Rhenosterkop 155. However, this mine leads to negligible loss of agricultural production potential because it is mining rock from a dolerite koppie with almost no vegetation cover. It therefore does not add to the cumulative loss of agricultural production potential in the area.

Due to all the considerations discussed above, the cumulative impact of loss of future agricultural production potential is assessed as low. It will not have an unacceptable negative impact on the agricultural production capability of the area, and it is therefore recommended, from a cumulative agricultural impact perspective, that the development be approved.

9.3 Assessment of Alternatives

Specialist assessments for EA are required to assess the impacts of alternatives, including the no-go alternative. As already noted, 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, because agriculture will be completely excluded from within the boundary, regardless of layout. Any alternative layouts within the boundary will have equal agricultural impact and are assessed as equally acceptable.

All technology alternatives, including the choice of Lithium-ion or redox flow for the BESS, will also have no bearing on the significance of agricultural impacts. All will have equal impact and are assessed as equally acceptable.

The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. There are no agricultural impacts of the no-go alternative. Even though the impacted land has insufficient agricultural production potential for cropping, and the impact of the development is low, its negative agricultural impact is marginally more significant than that of the no-go alternative, and so from an agricultural impact perspective, the no-go alternative is the preferred alternative. 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 in South Africa.

10 MITIGATION

10.1 Mitigation Measures

The most important and effective mitigation of agricultural impacts for any development is avoidance of viable croplands. This development has already applied this mitigation by selecting a site on which there are not viable croplands.

Generic mitigation measures that are effective in preventing soil degradation are all inherent in the engineering of such a project 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 design on site.
- 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 20 centimetres 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.

10.2 Inputs to the Environmental Management Programme

The inputs to the EMPr are detailed in **Table 2**,

Table 3, Table 4 and Table 5 for each development phase.

Table 2: 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 storm water 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.	Ensure that the storm water run-off control is included in the engineering design.	Once-off during the design phase.	Holder of the EA

Table 3: Management plan for the construction 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.	Implement an effective system of storm water 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 storm water 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. Photo evidence required.	Monthly during 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. Photo evidence required.	Every 4 months during the construction phase	ECO

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
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 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.	Record GPS positions of all occurrences of below-surface soil disturbance (e.g., excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area. Photo evidence required.	As required, whenever areas are disturbed.	ECO

Table 4: 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	The existence of hard surfaces causes no erosion on or downstream of the site.	Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring.	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be	Once per month during the dry season and after any rain events during the dry season. Weekly during the wet season.	Facility Environmental Manager / onsite ECO

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
			implemented to the run-off control system in the event of any erosion occurring. Photo evidence is required.		
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. Photo evidence is required.	Bi-annually	Facility Environmental Manager / onsite ECO

Table 5: 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 downstream of the site.	Implement an effective system of storm water 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	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream.	Every 2 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is	ECO

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		prevent any potential down slope erosion.	Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	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.	ECO
Topsoil loss	That topsoil loss is minimised	<p>If an activity will mechanically disturb the soil 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.</p> <p>During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.</p>	Record GPS positions of all occurrences of below-surface soil disturbance (e.g., excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.	As required, whenever areas are disturbed.	ECO

11 ADDITIONAL ASPECTS REQUIRED IN AN AGRICULTURAL COMPLIANCE STATEMENT

11.1 Micro-siting

The agricultural protocol (GN No. 320) requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. As already discussed in the section above, micro-siting within the footprint will make no material difference to agricultural impacts and disturbance.

11.2 Confirmation of Linear Activity

The agricultural protocol (GN No. 320) requires confirmation, in the case of a linear activity, that the land can be returned to the current state within two years of completion of the construction phase. This is not relevant in this case because the proposed development is not limited to being a linear one.

11.3 Compliance with the allowable Development Limits

The agricultural protocol (GN No. 320) 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 a proposed facility with a total generating capacity of 250 MW to occupy an agricultural footprint of $250 \times 2.5 = 625$ ha. The facility fenced area as shown in **Figure 2** and **Figure Figure 3** is 543 ha. It is therefore confirmed that the facility is in line with the allowable development limits contained in the agricultural protocol.

12 CONCLUSION

The overall conclusion of this assessment is that the proposed development is acceptable because it can provide benefits to agriculture but leads to no loss of potential cropland and therefore minimal loss of future agricultural production potential.

The site is classified as low to medium agricultural sensitivity by the National Web-Based Environmental Screening Tool (Screening Tool) promulgated in terms of Regulation 16(1)(b)(v) of the EIA Regulations. . This has been confirmed by this assessment, because of the agricultural production potential and current agricultural land use.

The arid climate is the limiting factor for land capability, regardless of the soil and terrain capability, although shallow, rocky soils are an additional limitation. Moisture availability is very limiting to any kind of agricultural production, including grazing and is completely insufficient for rain-fed crop production. The climate constraints mean that the site has low agricultural potential, and its agricultural use is limited to grazing only.

An agricultural impact is a change to the future agricultural production potential of land. In this case, the facility fenced area is considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations on its cropping potential. The production potential of the land is limited to only being suitable as grazing land, and there is no particular scarcity of such land in the country, in contrast to arable land, which is very scarce. The use of this land for non-agricultural purposes will cause minimal loss of agricultural production potential in terms of national food security.

Furthermore, the land occupied by PV panels can be used for the dual purposes of solar power generation and agricultural food production by way of sheep grazing. This has potential benefits for both activities and means that the land is not lost to agricultural production. At the farm level, the development will provide a positive economic impact. This is likely to increase financial security and cash flow and improve farming operations and productivity on other parts of the farms through increased investment into farming.

Due to the facts that the solar facility will not occupy scarce, viable cropland, that it can still be used to graze sheep, and that its negative impact is offset by economic benefits to farming, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

Its acceptability is further substantiated by the following points:

- The proposed development is within a REDZ, which is an area that has specifically been designated within South Africa for the prioritisation of renewable energy development. The designation of the REDZ has taken into account the country's need to balance renewable energy development against the conservation of land required for agricultural production and national food security.
- 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. Furthermore, a reduction in coal power saves water resources and therefore potentially makes more water available for irrigated agriculture.

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.

13 REFERENCES

Beck, H.E., N.E. Zimmermann, T.R. McVicar, N. Vergopolan, A. Berg, E.F. Wood. 2018. Present and future Köppen-Geiger climate classification maps at 1-km resolution, Nature Scientific Data. 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 (DAFF). 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 (DAFF). 2017. National land capability evaluation raster data layer, 2017. Pretoria.

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

Department of Agriculture, Land Reform and Rural Development (DALRRD). 2020. Protected agricultural areas – Spatial data layer. 2020. 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. South African Atlas of Agrohydrology and Climatology, 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*.



forestry, fisheries & the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

APPENDIX 2: SPECIALIST DECLARATION FORM AUGUST 2023

Specialist Declaration form for assessments undertaken for 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)

REPORT TITLE

PROPOSED SOLAR PHOTOVOLTAIC FACILITY, "RHINO" ON REMAINDER OF FARM RHENOSTERKOP 155 NEAR BEAUFORT WEST

Kindly note the following:

- This form must always be used for assessment that are in support of 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 August 2023. 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.dffe.gov.za/documents/forms>.
- An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
- The specialist must be aware of and comply with 'the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020', where applicable.

1. SPECIALIST INFORMATION

Title of Specialist Assessment	Agricultural Assessment
Specialist Company Name	Not applicable – sole proprietor
Specialist Name	Johann Lanz
Specialist Identity Number	6607045174089
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
Telephone	Not applicable
Cell phone	+27 82 927 9018
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 am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. “the Protocols”) and in Government Notice No. 1150 of 30 October 2020.
- 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 NEMA Act.



Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company:

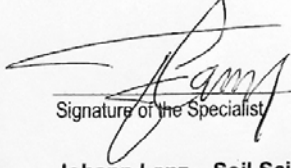
8 January 2024

Date

SPECIALIST DECLARATION FORM – AUGUST 2023

3. UNDERTAKING UNDER OATH/ AFFIRMATION

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

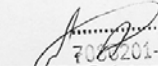


Signature of the Specialist

Johann Lanz – Soil Scientist – sole proprietor

Name of Company

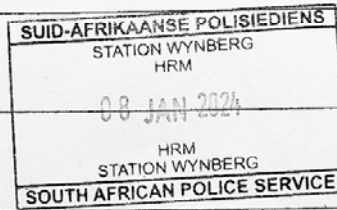
Date 08/01/2024

 SERGEANT
7000201-0 SA CAKUMA

Signature of the Commissioner of Oaths

Date 2024/01/08

Date



APPENDIX 3: SACNASP REGISTRATION CERTIFICATE



herewith certifies that

Johan Lanz

Registration Number: 400268/12

is a registered scientist

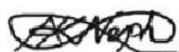
in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

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

Soil Science (Professional Natural Scientist)

Effective **15 August 2012**

Expires **31 March 2024**



Chairperson



Chief Executive Officer



To verify this certificate scan this code

APPENDIX 4: PROJECTS INCLUDED IN CUMULATIVE IMPACT ASSESSMENT

DEA Reference	Project Name	Type	Capacity (MW)
14/12/16/3/3/1/2517	Bulkskop PV	PV	120
14/12/16/3/3/1/2518	Gamka PV	PV	120
14/12/16/3/3/1/2519	Hardeveld PV	PV	120
14/12/16/3/3/1/2520	Hoodia PV	PV	120
14/12/16/3/3/1/2521	Rosenia PV	PV	120
12/12/20/2133	Solar Facility Proposed by Lurama 214 Pty Ltd on Portion 1 of The Farm Steenrotsfontein 168	PV	19
12/12/20/2286	The Beaufort West Photovoltaic Park on Portion9 of The Farm 161 Kuilspoort	PV	85
14/12/16/3/3/1/2332	Beaufort West Photovoltaic (PV) Project	PV	75
14/12/16/3/3/2/772	Beaufort West Solar Power Plant Site 1	PV	90
14/12/16/3/3/2/773	Beaufort West Solar Power Plant Site 2	PV	90
14/12/16/3/3/2/774	Beaufort West Solar power plant site 3	PV	90
	Rhino Solar PV	PV	250
	Sunnyside Solar PV	PV	250
14/12/16/3/3/1/2494	Jessa m wind energy facility	Wind	220
14/12/16/3/3/1/2496	Jessa z wind energy facility	Wind	220
	N1 Wind Farm	Wind	240
12/12/20/1784/1	Beaufort West Wind Farm	Wind	140
Total solar			1549
Total wind			820
Total			2369